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| **ASSIGNMENT 3** |
| **Marks: 10** |

# THE DATA DESIGN PROCESS (5)

Imagine that you have been assigned to a team that will be developing an inventory tracking

System. As part of the project startup, your manager has asked each team leader to bring a basic

work plan to the next meeting. At that meeting, these work plans will be analyzed to determine

the overall project timeframe, costs, personnel requirements and software requirements.

For now, as the team leader for the data design team, you have been asked to bring a work plan

that **identifies the phases of data design** and includes the following information for each phase:

**a). a description of the data design phase,**

**b). the inputs of the phase,**

**c). the outputs of the phase,**

**d). a key issue addressed in the phase**

**e). a challenge that you can anticipate would occur in the phase.**

**Solution:**

**CONCEPTUAL DESIGN PHASE:**

**DESCRIPTION***:*

Create model that covers major entities, relationships among entities and attributes of entities required for a system.

**ISSUES:**

* Covering all the data.
* Covering every relationship.
* Data integrity.

**INPUTS:**

* Functional Specs.
* General understanding of Problems.

**OUTPUT:**

* ER Diagram.

**CHALLENGES:**

Major challenges which we can face the relationship between entities in ER diagram and attributes of entities without data gather and analysis.

**LOGICAL DESIGN PHASE:**

**DESCRIPTION:**

Transform the major entity, attribute, relationship requirements into high level specification for database

**ISSUES:**

* Providing location for data.
* Data integrity.

**INPUTS:**

* ER Diagram.

**OUTPUT:**

* Relational Database Schema.

**CHALLENGES:**

No challenges.

**IMPROVING LOGICAL DESIGN PHASE:**

**DESCRIPTION:**

Improving the high-level database specification.

**ISSUES:**

* Minimizing Redundancy.
* Minimizing ambiguity.

**INPUTS:**

* Relational Database Schema.

**OUTPUT:**

* Relational Database Schema.

**CHALLENGES:**

No challenges.

**PHYSICAL DESIGN PHASE:**

**DESCRIPTION:**

Transform the high-level specifications for database into detailed specifications for how to construct actual database in a specific relational database software.

**ISSUES:**

* Performance.
* Data integrity.

**INPUTS:**

* Relational Database Schema.
* Meaning of Data.

**OUTPUT:**

Technical specifications for construction of the database

**CHALLENGES:**

* The main challenges considered during the physical database design are the storage format for each attribute (choosing the data type), the grouping of attributes into physical records, arranging records into file organizations, selecting structures for storing and connecting files to make retrieving data efficient, preparing stategies for handling queries against the database that will optimize performance

**CREATING A RELATIONAL DATABASE SCHEMA (5)**

Production tracking is important in many manufacturing environments (e.g., the pharmaceuticals

Industry, children’s toys, etc.). The following ER diagram captures important information in the

Tracking of production. Specifically, the ER diagram captures relationships between productions

Lots (or batches), individual production units, and raw materials.



Convert the ER diagram into a relational database schema. Be certain to indicate

Primary keys and referential integrity constraints.

**Solution:**

**Production Unit, Lot,Raw Material is strong entities**

**Production Units:**

**Lot**

**Raw Materials**

**Raw Materials Usage**

LotNumber

CostOfMaterials

CreateDate

**Serial#**

**ExactWeight**

**LotNumbe**

**QualityTest?**

**ProductDesc**

**ProductType**

r

LotNumber

MaterialID

Units

MaterialID

UnitCost

Type