Republic of the Philippines
Department of Education
REGION III
SCHOOLS DIVISION OFFICE OF NUEVA ECIJA

LEARNING ACTIVITY SHEET
SPECIAL PROGRAM IN ICT 10
INFORMATION SYSTEM AND RESEARCH 10
Fourth Quarter, Week 2

Name of Learner: _____ Date:_____

Grade Level /Section: _____

DATABASE DESIGN

BACKGROUND INFORMATION FOR LEARNERS

Database design is defined as a collection of steps that help with designing, creating, implementing, and maintaining a business's data management systems. The main purpose of designing a database is to produce physical and logical models of designs for the proposed database system.

Importance of Database Design

Database design defines the database structure used for planning, storing, and managing information. Accuracy in data can only be accomplished if a database is designed to store only valuable and necessary information.

A well-designed database is imperative in guaranteeing information consistency, eliminating redundant data, efficiently executing queries, and improving the performance of the database. Meticulously designing a database saves you from wasting time and getting frustrated during the database development phase. A good database design also allows you to easily access and retrieve data whenever needed.

The reliability of data depends on the table structure; whereas creating primary and unique keys guarantees uniformity in the stored information. Data replication can be avoided by forming a table of probable values and using a key to denote the value. So, whenever the value changes, the alteration happens only once in the main table.

As the general performance of a database depends on its design, a good database design uses simple queries and faster implementation. It is easy to maintain and update; whereas fixing trivial interruptions in a poor database design may harm stored events, views, and utilities.

Logical vs Physical Design

A logical design is a conceptual, abstract design. The process of logical design involves arranging data into a series of logical relationships called entities and attributes. An entity represents a chunk of information. In relational databases, an entity often maps to a table.

The logical design is more conceptual and abstract than the physical design. In the logical design, you look at the logical relationships among the objects. In the physical design, you look at the most effective way of storing and retrieving the objects.

Your design should be oriented toward the needs of the end users. End users typically want to perform analysis and look at aggregated data, rather than at individual transactions. Your design is driven primarily by end-user utility, but the end users may not know what they need until they see it. A well-planned design allows for growth and changes as the needs of users change and evolve.

The process of logical design involves arranging data into a series of logical relationships called entities and attributes. An entity represents a chunk of information. In relational databases, an entity often maps to a table. An attribute is a component of an entity and helps define the uniqueness of the entity. In relational databases, an attribute maps to a column.You can create the logical design using a pen and paper, or you can use a design tool such as Oracle Warehouse Builder or Oracle Designer.

One output of the logical design is a set of entities and attributes corresponding to fact tables and dimension tables. Another output of mapping is operational data from your source into subject-oriented

information in your target data warehouse schema. You identify business subjects or fields of data, define relationships between business subjects, and name the attributes for each subject.

After completing the logical design of your database, you now move to the physical design. The physical design of your database optimizes performance while ensuring data integrity by avoiding unnecessary data redundancies. During physical design, you transform the entities into tables, the instances into rows, and the attributes into columns.

Physical design is the time when you abbreviate the names that you chose during logical design. For example, you can abbreviate the column name that identifies employees, EMPLOYEE_NUMBER, to EMPNO.

LEARNING COMPETENCY

Compare and contrast logical and physical database design.

ACTIVITIES

Activity 1 :

True or False: Write True if the statement is correct. If false, underline the word that makes the statement incorrect and write the word that will make the statement true.

_____1. Physical design is the time when you abbreviate the names that you chose during logical design.

_____2. The logical design of your database optimizes performance while ensuring data integrity by avoiding unnecessary data redundancies.

_____3. Accuracy in data can only be accomplished if a database is designed to store only valuable and necessary information.

_____4. The reliability of data depends on the design structure.

_____5. Your design should not be oriented toward the needs of the end users.

Activity 2:

Answer the following questions briefly:

1. Define database in your own words?

_____
_____

2. Enumerate at least three characteristics of a good database design.

_____
_____

3. Differentiate logical design from physical design.

_____
_____

REFLECTION:

Why does good database design important?

_____
_____
_____

REFERENCES

Database Design - Overview, Importance, and Techniques | Astera
Database Design Phase 2: Logical and Physical Design - MariaDB Knowledge Base
1 1 2 Logical Models versus Physical Models (lansa.com)

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