Department of CSE

COURSE NAME: DBMS
COURSE CODE:23AD2102R

Topic: **DATA MODELS(ER MODEL)**

Session - 2

AIM OF THE SESSION

To familiarize students with the basic concept Database Management Systems

INSTRUCTIONAL OBJECTIVES

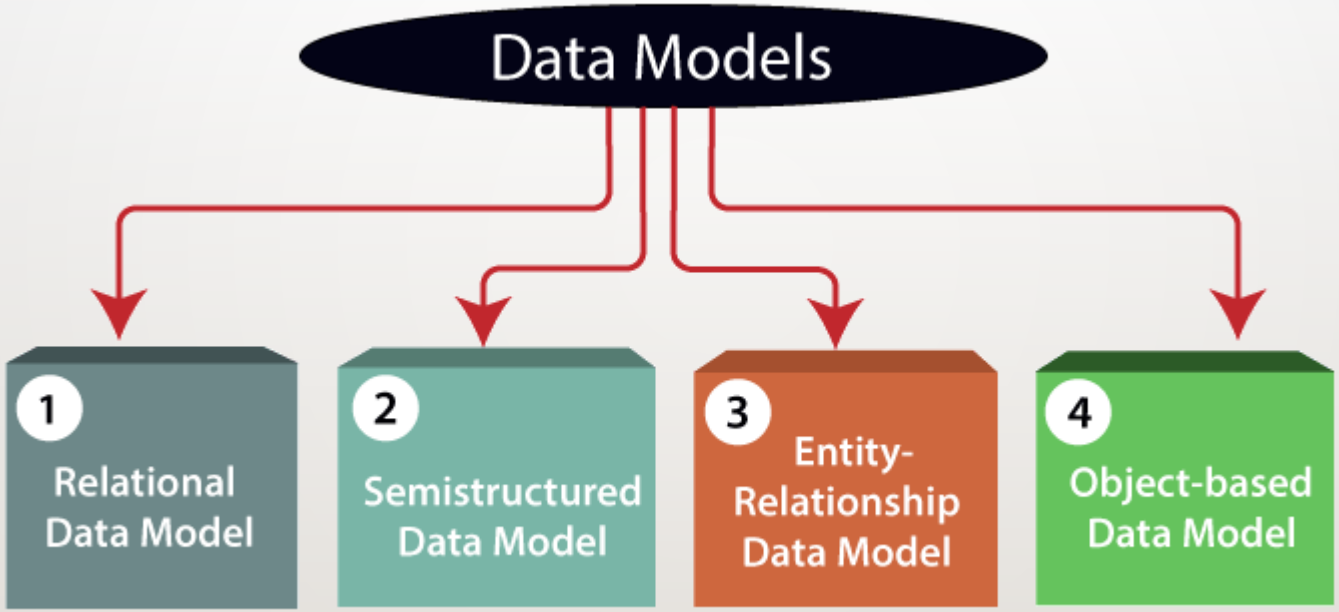
This Session is designed to: Characteristics of DBMS

LEARNING OUTCOMES

At the end of this session, you should be able to: basic knowledge of DBMS

Data Models in DBMS

Data Model is the modeling of the data description, data semantics, and consistency constraints of the data. It provides the conceptual tools for describing the design of a database at each level of data abstraction.



SESSION INTRODUCTION

1) **Relational Data Model:** This type of model designs the data in the form of rows and columns within a table. Thus, a relational model uses tables for representing data and in-between relationships. Tables are also called relations.

2) **Entity-Relationship Data Model:** An ER model is the logical representation of data as objects and relationships among them. These objects are known as entities, and relationship is an association among these entities.

SESSION INTRODUCTION

3) Object-based Data Model: An extension of the ER model with notions of functions, encapsulation, and object identity, as well. This model supports a rich type system that includes structured and collection types.

4) Semistructured Data Model: This type of data model is different from the other three data models. The semistructured data model allows the data specifications at places where the individual data items of the same type may have different attributes sets. The Extensible Markup Language, also known as XML, is widely used for representing the semistructured data.

SOME OTHER DATA MODELS

1. Hierarchical Model

In a hierarchical model, data are viewed as a collection of tables, or we can say segments that form a hierarchical relation. In this, the data is organized into a tree-like structure where each record consists of one parent record and many children. Even if the segments are connected as a chain-like structure by logical associations, then the instant structure can be a fan structure with multiple branches. We call the illogical associations as directional associations.

2. Network Model

This model is the generalization of the hierarchical model. This model can consist of multiple parent segments and these segments are grouped as levels but there exists a logical association between the segments belonging to any level. Mostly, there exists a many-to-many logical association between any of the two segments.

Advantages of Data Models

- Data Models help us in representing data accurately.
- It helps us in finding the missing data and also in minimizing Data Redundancy.
- Data Model provides data security in a better way.
- The data model should be detailed enough to be used for building the physical database.
- The information in the data model can be used for defining the relationship between tables, primary and foreign keys, and stored procedures.

Disadvantages of Data Models

- In the case of a vast database, sometimes it becomes difficult to understand the data model.
- You must have the proper knowledge of SQL to use physical models.
- Even smaller change made in structure require modification in the entire application.
- There is no set data manipulation language in DBMS.
- To develop Data model one should know physical data stored characteristics.

SELF-ASSESSMENT QUESTIONS

1. Data is

(a) Used in decision making
(b) Raw facts or events
(c) Transformed facts
(d) Information

2. What is a database?

(a) Organized collection of information that cannot be accessed, updated, and managed
b) Collection of data or information without organizing
c) Organized collection of data or information that can be accessed, updated, and managed
d) Organized collection of data that cannot be updated

SUMMARY

1. Understand the Data Models of DBMS
2. History of Data models
3. Advantages and disadvantages of data models

TERMINAL QUESTIONS

1. Describe the history of datamodels.
2. List out the advantages and disadvantages of datamodels.
3. Analyze types of datamodels.
4. Summarize the characteristics of database approach.

REFERENCES FOR FURTHER LEARNING OF THE SESSION

Reference Books:

1. 1. Database System Concepts, Sixth Edition, Abraham Silberschatz, Yale University Henry, F. Korth Lehigh University, S. Sudarshan Indian Institute of Technology, Bombay.
2. Fundamentals of Database Systems, 7th Edition, RamezElmasri, University of Texas at Arlington, Shamkant B. Navathe, University of Texas at Arlington.

Web Link:

1. https://nptel.ac.in/courses/106105175

THANK YOU

(DEEMED TO BE UNIVERSITY)

Team – DBMS