

Database Creation and Management

Database Approach-II

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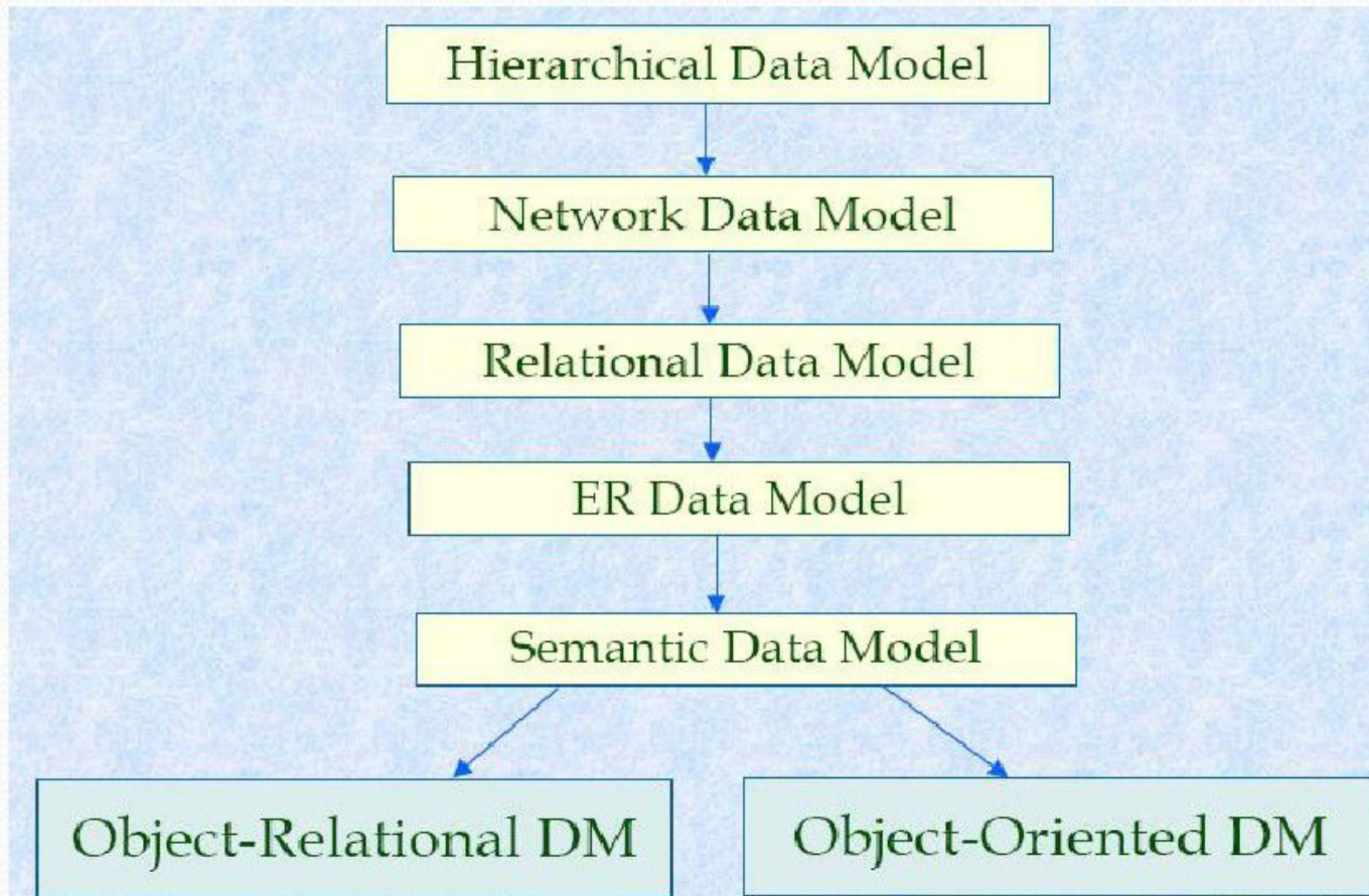
Outline

- Data Models
- DBMS Architecture
 - 1-tier architecture
 - 2-tier architecture
 - 3-tier architecture

Data models

- Data models are data structures which describe how data are represented and accessed.
- Data models must be simple and intuitive to enable applications.
- The major types of data models :
 - Hierarchical model
 - Network Model
 - Relational Model
 - Object Model or semantic data model

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Types of Data Models

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Hierarchical model

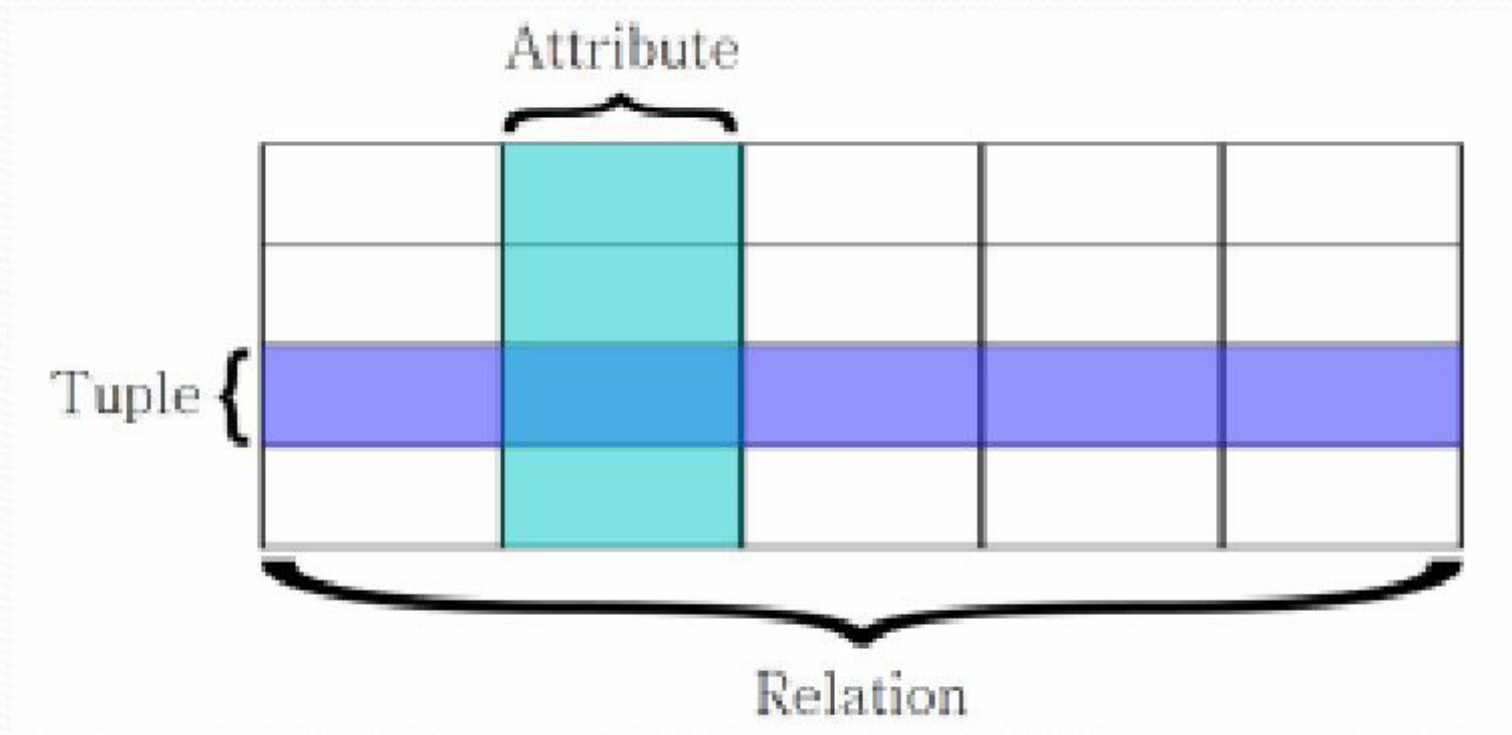
- A tree-like structure.
- This supports parent-child relationships between data similar to a tree data structure
- object types are represented by nodes and their relationships are represented by arcs.

Network Model

- This is similar to the hierarchical model in representation of data
- This model are represented by collection of records and relationships among data are represented by links, which can be viewed as pointers.

Relational Model

- This model organizes data into two dimensional arrays known as relations (tables)
- Each relation consists of rows (Tuples) and columns (Attributes)



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ER model

- It is based on the notion of the real world entities and their relationships.
- this model is dependent on two vital things and they are :
 - Entity and their attributes
 - Relationships among entities

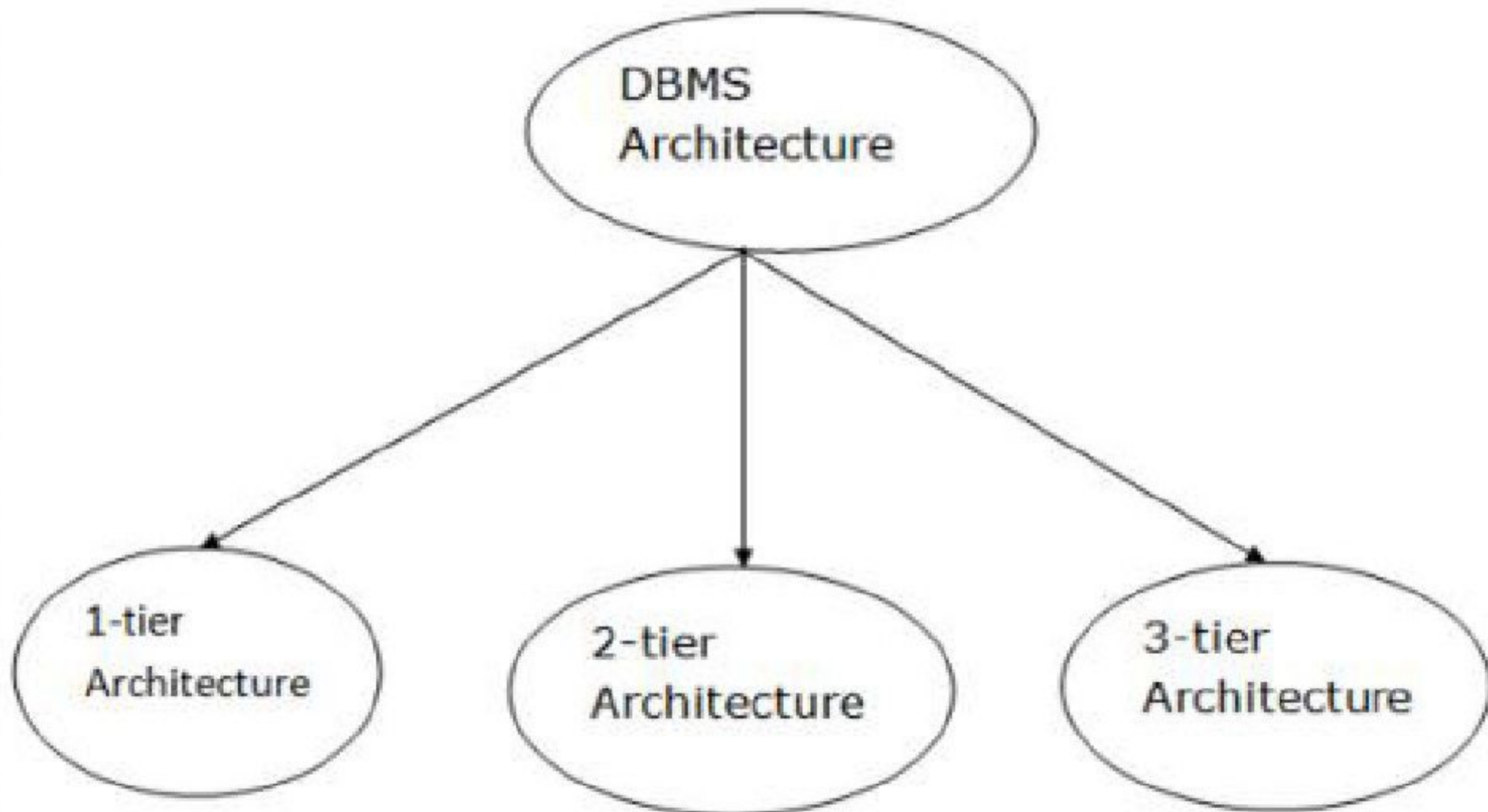
Object Model

- This model allows for data persistence and storage by storing objects in the databases.
- The relationships between various objects are inherent in the structure of the objects.

DBMS Architecture

- It is a representation of DBMS design.
- It helps to design, develop, implement, and maintain the database management system.
- A DBMS architecture allows dividing the database system into individual components that can be independently modified, changed, replaced, and altered.
- It also helps to understand the components of a database.
- DBMS architecture depends upon how users are connected to the database to get their request done.

Types of DBMS Architecture



1-Tier Architecture

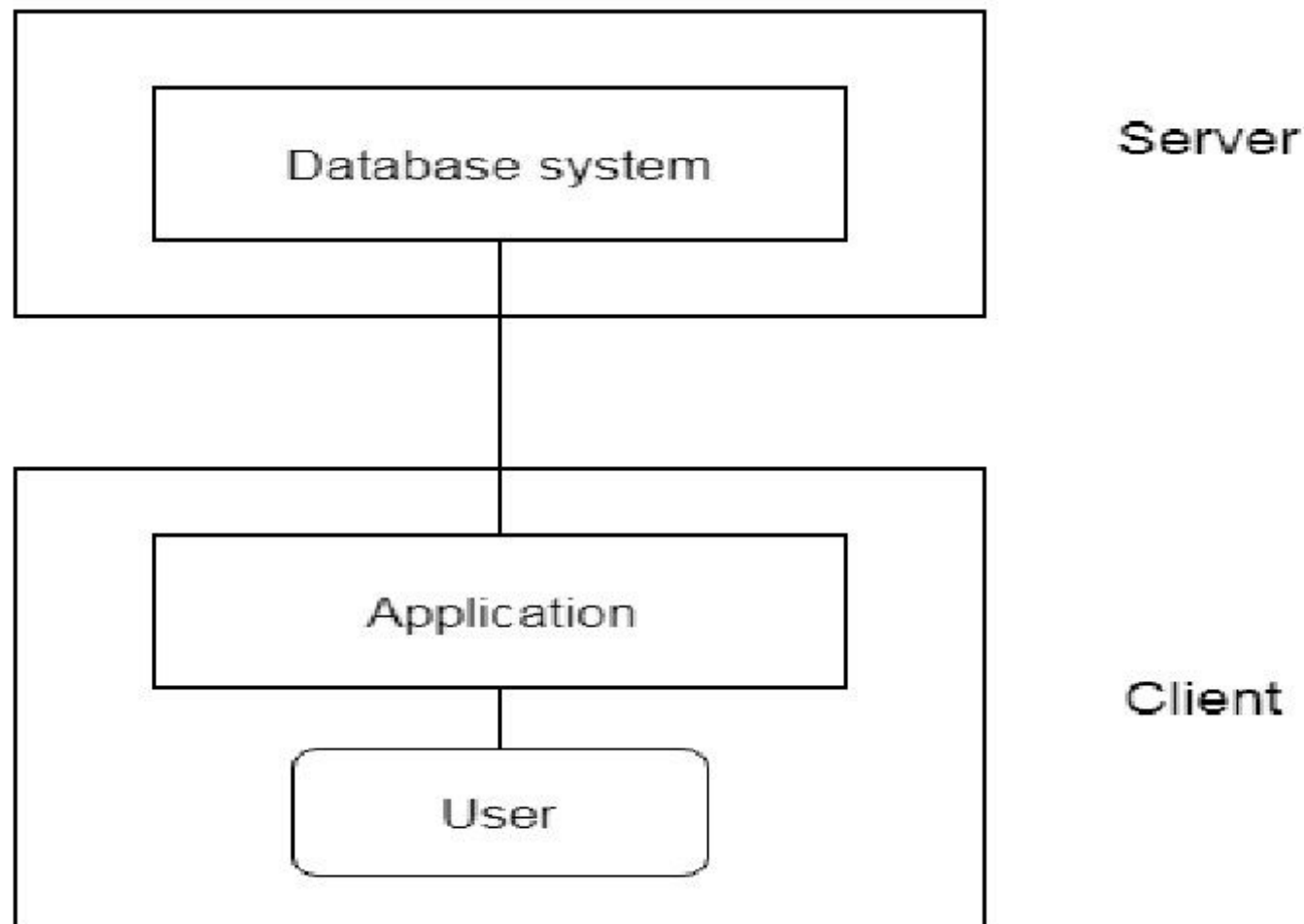
- In this architecture, the database is directly available to the user. It means the user can directly sit on the DBMS and uses it.
- Any changes done here will directly be done on the database itself.
- It doesn't provide a handy tool for end users.
- A simple one tier architecture example would be anytime you install a Database in your system and access it to practice SQL queries.

2-Tier Architecture

- It is same as basic client-server.
- In this architecture, applications on the client end can directly communicate with the database at the server side. For this interaction, API's like: **ODBC, JDBC** are used.
- The user interfaces and application programs are run on the client-side.
- The server side is responsible to provide the functionalities like: query processing and transaction management.

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- To communicate with the DBMS, client-side application establishes a connection with the server side.



3-Tier Architecture

- In this architecture contains another layer between the client and server.
- Client can't directly communicate with the server.
- The application on the client-end interacts with an application server which further communicates with the database system.
- End user has no idea about the existence of the database beyond the application server. And vice versa.
- It is used in case of large web application.

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