DATABASE MANAGEMENT SYSTEM

Chapter 2:

Database Design, Architecture and Model

2.2 Views Of Data

Data abstraction/Three-Schema Architecture

Chapter Outlines

- Introduction to Views of Data
- Level of Abstractions/Three-Schema (Three-Level) Architecture
  - Diagram
  - Physical Level
  - Logical Level
  - View Level
  - Example

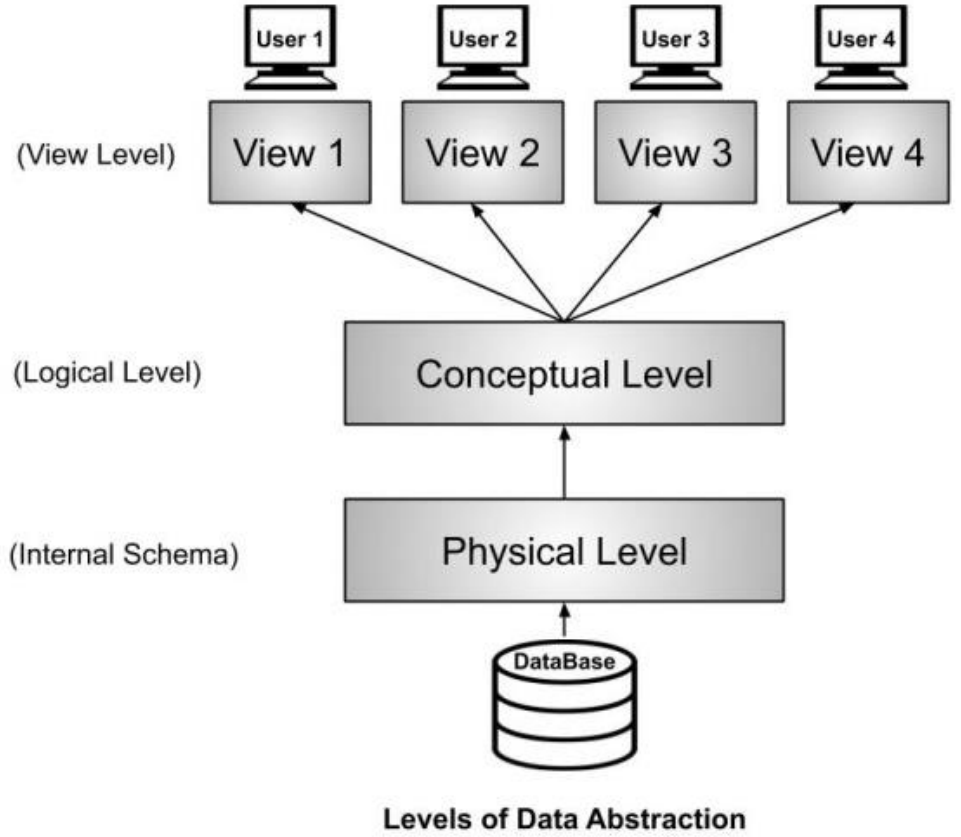
Introduction to View of Data

- View of data in DBMS describes the abstraction of data at three-level i.e. physical level, logical level, view level.
- **View of data** in DBMS narrate how the data is visualized at each level of data abstraction

Data Abstraction

- Data abstraction is **hiding the complex data structure** in order to **simplify the user's interface** of the system.
- It is done because many of the users interacting with the database system are not that much computer trained to understand the complex data structures of the database system.
- Data abstraction can be achieved by **Three-Schema architecture** which abstracts the database at three levels.

Level of Abstraction (Three-Schema Architecture)



Levels of Data Abstraction

Physical Level/ Internal Level

- The physical or the internal level schema describes **how the data is stored in the hardware**.
- It also describes how the data can be accessed.
- The physical level shows the data abstraction at the lowest level and it has **complex data structures**.
- Only the database administrator operates at this level.

Logical Level/ Conceptual Level

- It is a level above the physical level.
- This level deal with the information that is actually stored in the database in the form of tables.
- It also stores the relationship among the data entities in relatively simple structures.
- It is the developer and database administrator who operates at the logical or the conceptual level.

View Level/ User level/ External level

- This is the highest level of abstraction.
- Only a part of the actual database is viewed by the users.
- This level exists to ease the accessibility of the database by an individual user. Users view data in the form of rows and columns.
- Tables and relations are used to store data.
- Multiple views of the same database may exist.
- Users can just view the data and interact with the database, storage and implementation details are hidden from them.

Data Abstraction Level Example:

In case of storing customer data,

- Physical level – it will contains block of storages (bytes,GB,TB,etc)
- Logical level – it will contain the fields and the attributes of data.
- View level – it works with CLI or GUI access of database.

END