Data Abstraction Levels/Views in Databases

A major purpose of a database system is **to provide users with an abstract view of the data**. That is, the **system hides** certain details of **how the data are stored and maintained**.

For the system to be usable, **it must retrieve data efficiently**. For this, **database designers uses complex data structures** to represent data in the database. Since many database-system users are not computer trained, developers **hide the complexity from users** through several levels of **abstraction**:
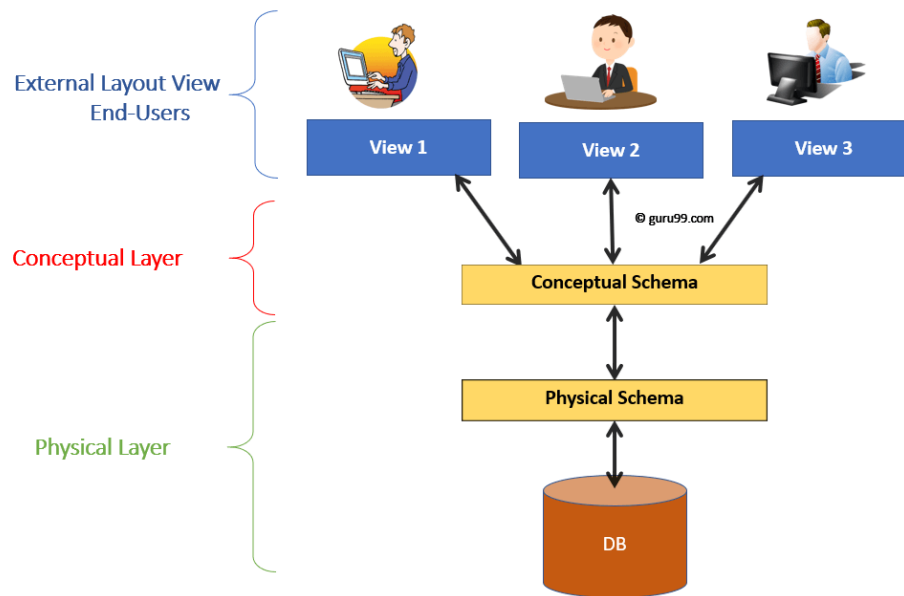
• **Physical level**

    i)   The lowest level of abstraction describes **how the data are actually stored**.
    ii)   The physical level describes complex **low-level data structures in detail**.

• **Logical level**

    i)   The next-higher level of abstraction describes **what data are stored in the database**
    ii)   **What relationships exist** among those data?
    iii)   The user of the logical level does not need to be aware of low-level structure complexity. This is **referred to as physical data independence**.
    iv)   Database administrators, who must decide what information to keep in the database, use the logical level of abstraction.

• **View level**

    i)   The **highest level** of abstraction **describes only part of the entire database**.
    ii)   Even though the **logical level uses simpler structures**, **complexity remains** because of the **variety of information stored in a large database**.
    iii)   Many users of the database system do not need all this information; instead, they need to access only a part of the database.
    iv)   The view level of abstraction exists to simplify their interaction with the system. The system may **provide many views for the same database**.

External Layout View End-Users · Conceptual Layer · Physical Layer

© guru99.com

View 1 · View 2 · View 3

Conceptual Schema

Physical Schema

DB

*   *   *