DATABASE MANAGEMENT SYSTEM

Chapter 2:

Database Design, Architecture and Model

2.4 Data Independence

Outlines

- Introduction
- Data Independence Diagram
- Types of Data Independence
  - Logical Data Independence
  - Physical Data Independence

Data Independence

- Data independence in DBMS (Database Management System) refers to the ability to modify the schema (structure or organization) of a database without affecting the applications that use the data.
- Data is separated from the programs, so that the changes made to the data will not affect the program execution and the application.
- Types of Data Independence:
  - Logical Data Independence
  - Physical Data Independence

Data Independence Diagram

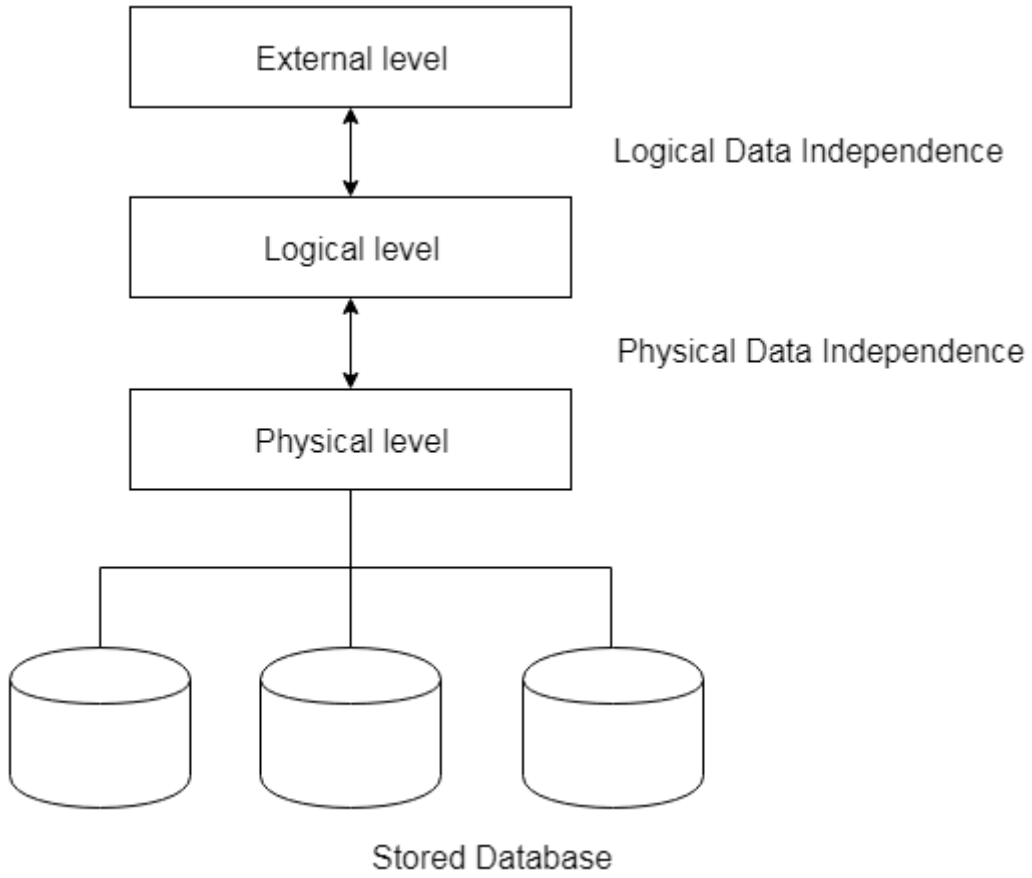

Fig: Data Independence

Logical Data Independence

- This refers to the ability to modify the logical schema of a database without affecting the applications that use the data.
- In other words, changes made to the way the data is organized and accessed such as
  - adding or removing or renaming tables,
  - adding or removing or renaming columns,
  - changing relationships between tables

should not affect the way the data is accessed or used by applications.

Codd's Rule of Logical Data Independence says that users should be able to manipulate the Logical View of data without any information of its physical storage.

Physical Data Independence

- This refers to the ability to modify the physical storage structure of a database without affecting the logical schema.
- In other words, changes made to the way the data is stored on disk such as
  - adding or removing indexes,
  - changing data compression methods, or
  - moving to a different storage medium, like magnetic tape, hard disk

  should not affect the way the data is accessed or used by applications.

Data independence is important because it allows for greater flexibility in managing databases, as well as easier maintenance and modification of the database schema over time.

END