Introduction DBMS-Concepts & Architectures

CHAPTER 1

What is Data?

- Data is raw facts and Figures
- Data is a collection of facts, such as numbers, words, measurements, observations or just descriptions of things.

Database

- Database is a collection of information
- Database is collection of records
- A **database** is an organized collection of data, so that it can be easily accessed and managed.
- A database is an organized collection of structured information, or data, typically stored electronically in a computer system.

Database Management System

- Database Management Systems (DBMS) are software systems used to store, retrieve, and run queries on data. A DBMS serves as an interface between an end-user and a database, allowing users to create, read, update, and delete data in the database.
- Database management system is a software which is used to manage the database. For example: MySQL, Oracle, etc are a very popular commercial database which is used in different applications.
- DBMS provides an interface to perform various operations like database creation, storing data in it, updating data, creating a table in the database and a lot more.
- It provides protection and security to the database. In the case of multiple users, it also maintains data consistency.

DBMS Architecture

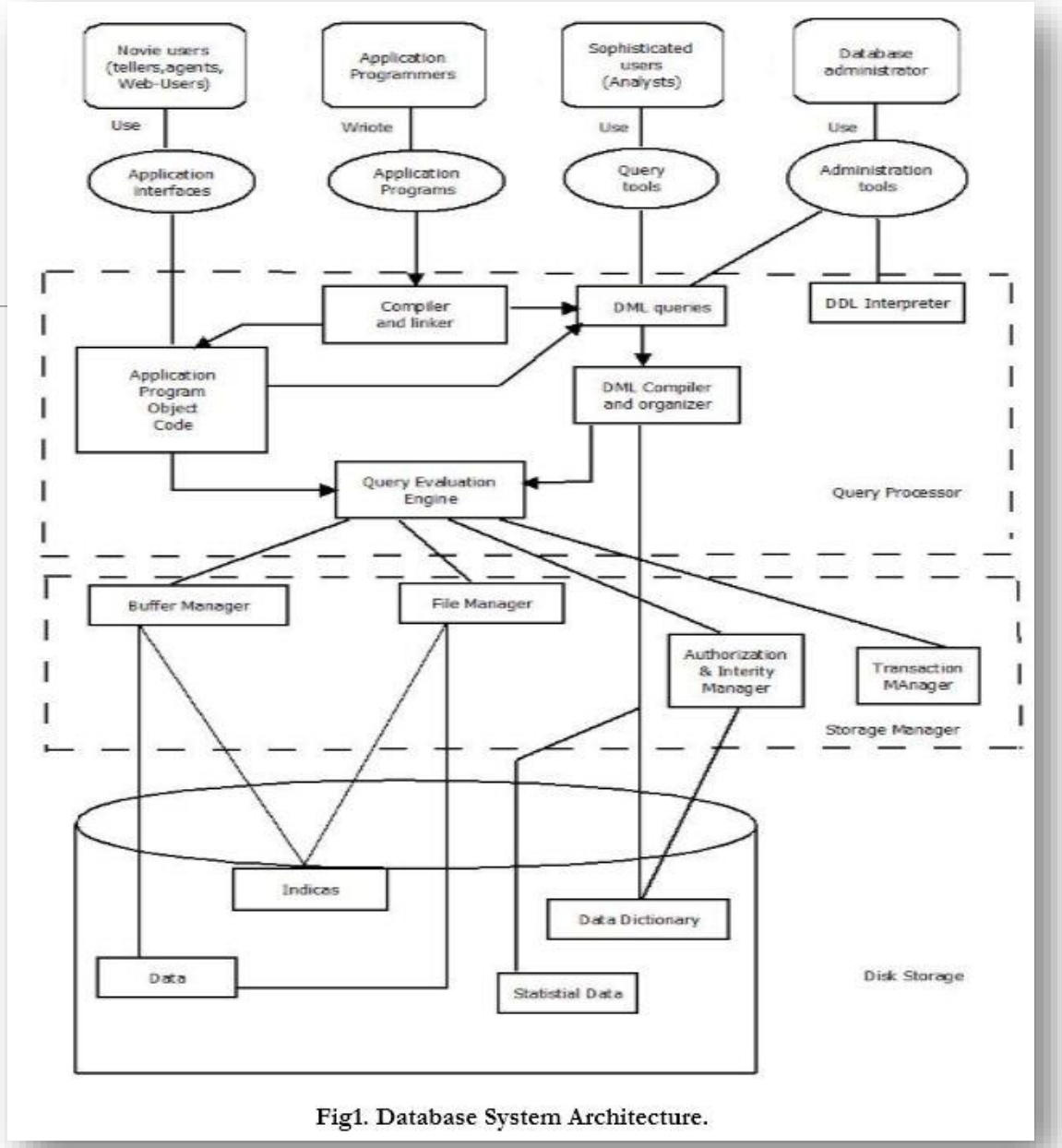


Fig1. Database System Architecture.

Database User

- Application Programmer
- Sophisticated User
- Specialized User
- Naive User
- DBA

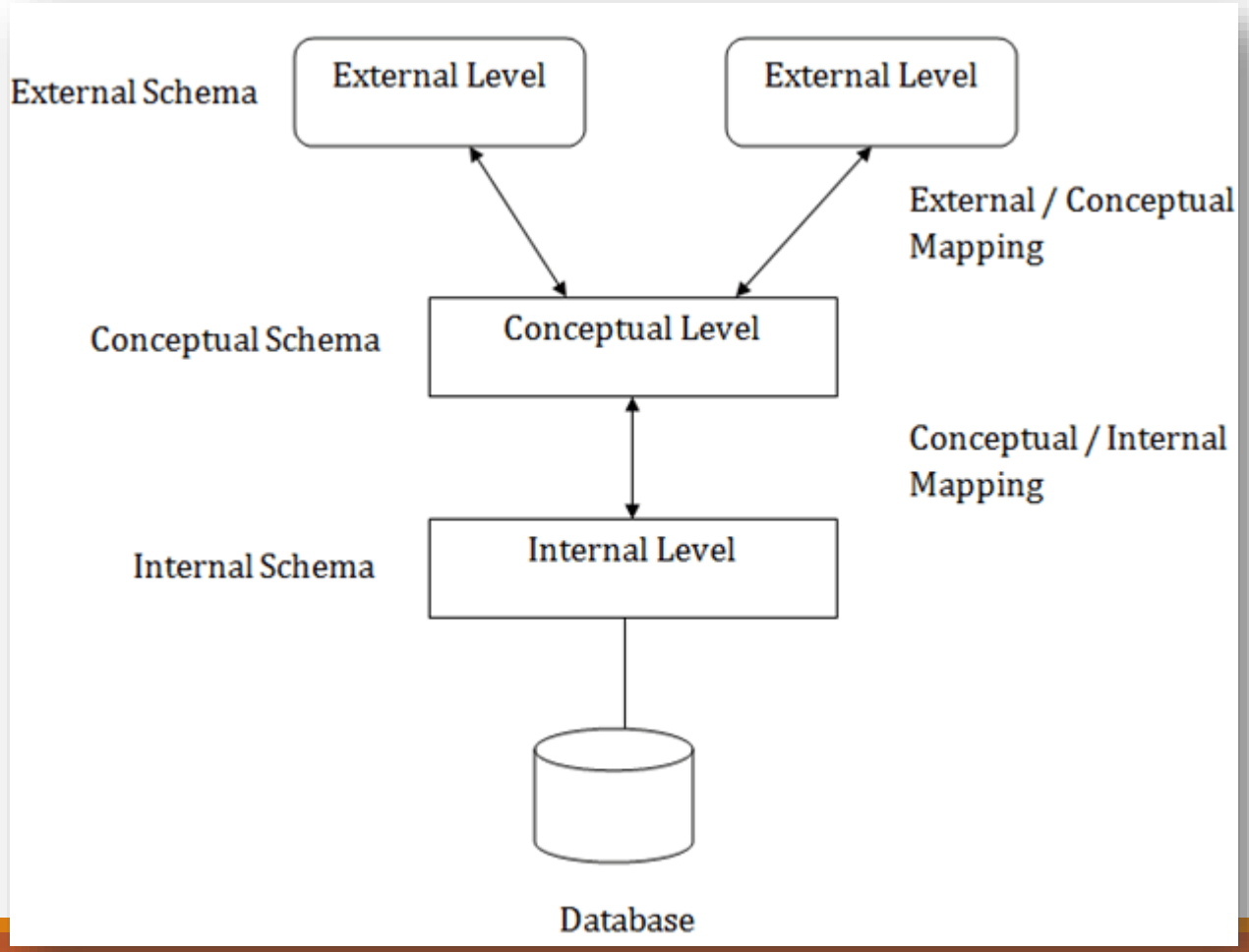
Need of DBMS

- Ease of Accessing Data
- Storage and Management of Data
- Avoiding duplicates and Redundancy
- Concurrent Data Accessing
- Database Integrity

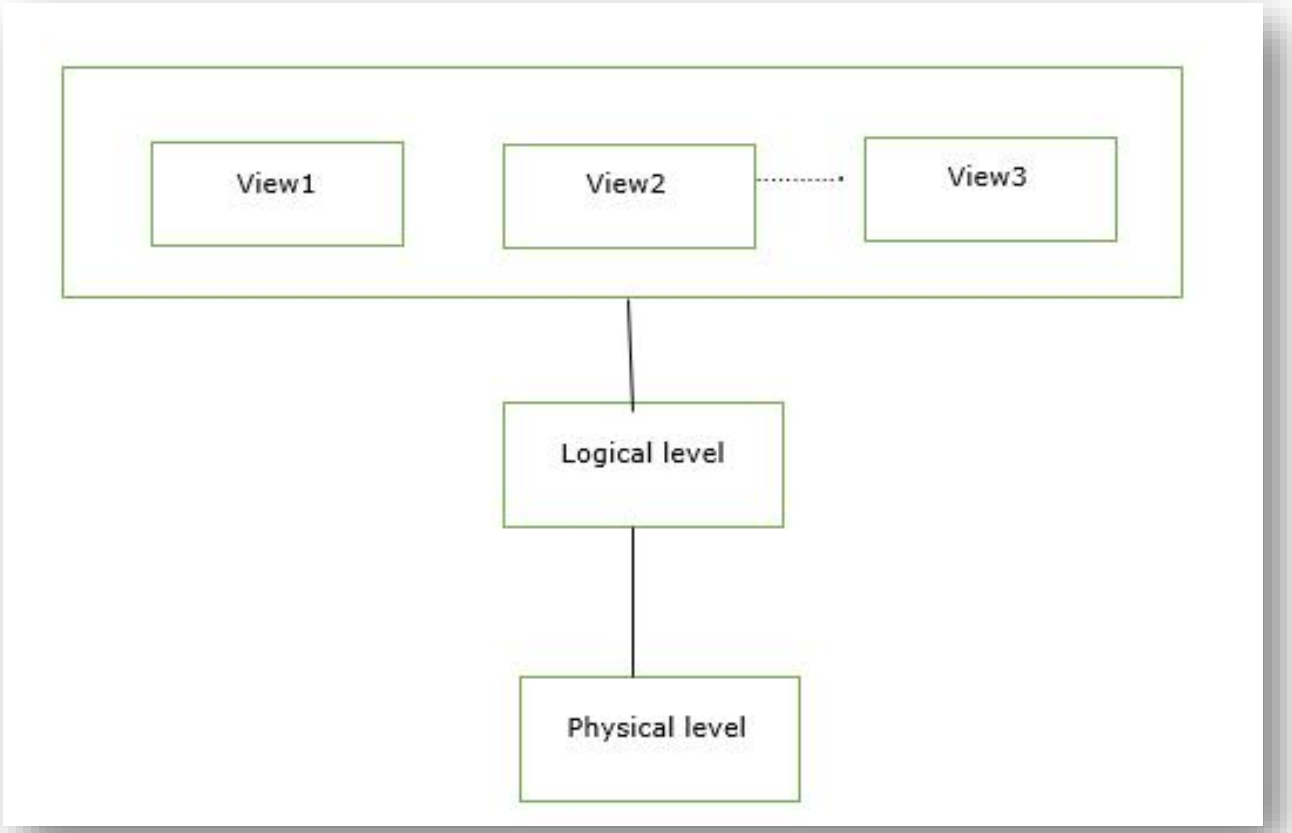
Characteristics of DBMS

- Real World Entity
- Self Explaining Nature
- Atomicity of Operations (Transactions)
- Concurrent Access without Anomalies
- Stores Any Kind of Structured Data
- Integrity
- Ease of Access (The DBMS Queries)
- SQL and No-SQL Databases
- Security
- ACID Properties

Database 3-tier schema (ANSI/SPARC) and system architecture of DBMS



Views of data- Schemas and instances



Data Independence

- Logical Data Independence
- Physical Data Independence

Types of Servers

- Centralized
- Client-Server system
- Transaction servers
- Data servers
- Cloud based servers