
DBMS

➡INTRODUCTION Of DBMS

Database and DBMS

- **Data models**
- **Types of Data model**
- **Comparison between File system and Database system**
- **Architecture of Database System**
- **Data independence**
- **Data dictionary**
- **DBA**
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Database And Database management system(DBMS)

➡Database defined as

A database is an organized collection of structured information, or data, typically stored electronically in a computer system. A database is usually controlled by a Database management system(DBMS).

➡ Database management system (DBMS) defined as

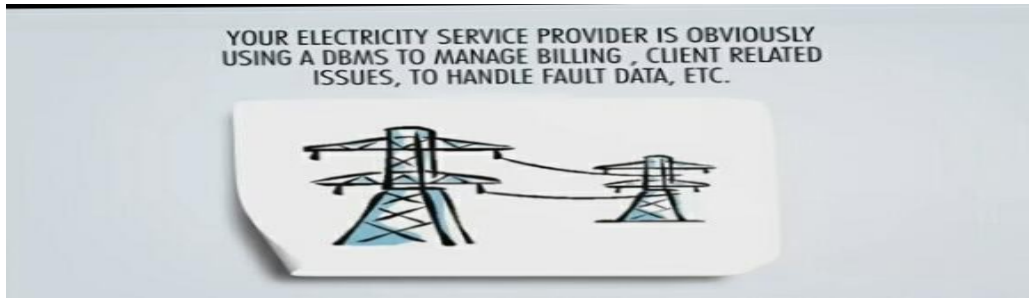
☞DBMS icon

1960 - Charles Bachman designed first DBMS system. In simple words.A Database Management System (DBMS) is software designed to store, define, and Manage the data in a database.

Example of DBMS

Example of Telephone

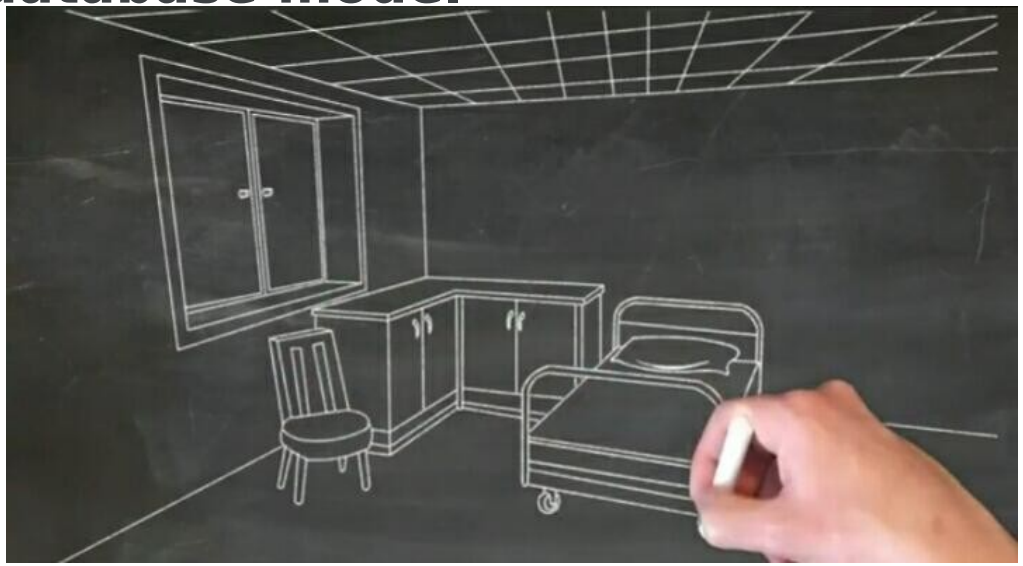
Example of electricity sevice



Data model

A **Database model** defines the logical design and structure of a **database** and defines how data will be stored, accessed and updated in a **database** management system. While the Relational **Model** is the most widely used **database model**

- **Some of the Data Models in DBMS a**
- Hierarchical **Model**.
- Network **Model**.
- Entity-Relationship **Model**.
- Relational **Model**.
- Object-Oriented **Data Model**.



Types of Data Model

In a Hierarchical database model data is organized in tree-like structure. Data is Stored Hierarchically (top down or bottom up) format. Data Is save with sequence Each record type In this model called node. Data is represented using a parent-child relationship.

- A node represent a particular entity

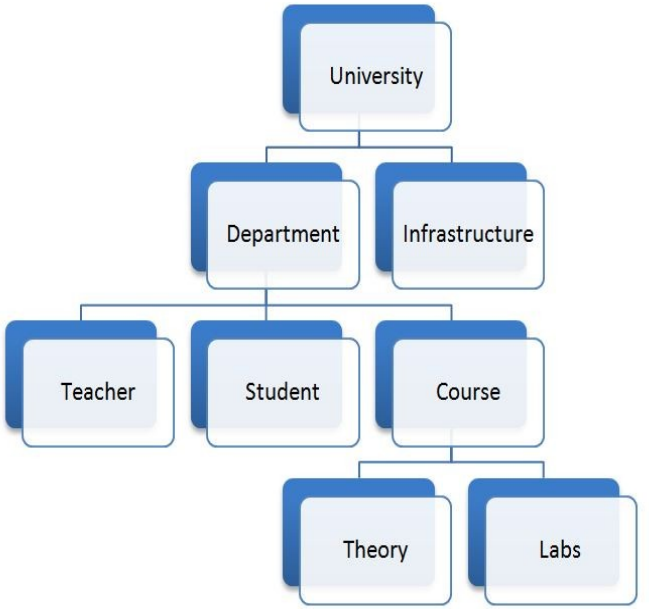
Types Of Data Model

Entity defined as

Entity in DBMS can be a real-world object with an existence, For example, in a College database, the entities can be Professor, Students, Courses, etc. ... The attribute value gets stored in the database.

Attributes defined as

Entities are represented by means of their properties, called **a** values. For example, a student entity may have name, class, a



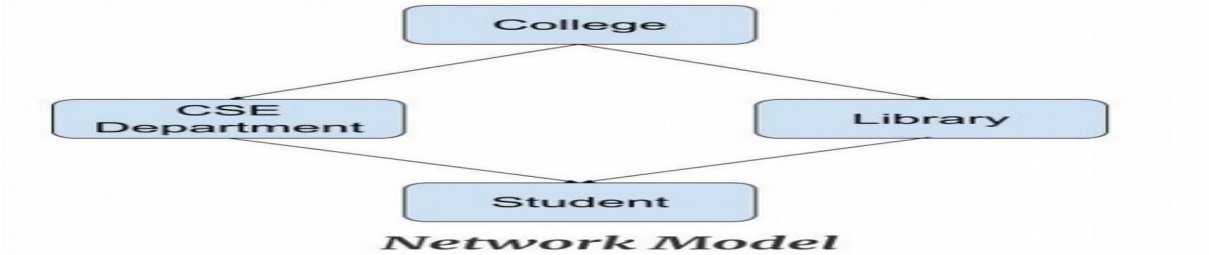
Top most node is called root

- A higher node is called parents root
- A lower level node is called child node
- A parent node have one or many node
- A child node Can have one parent node

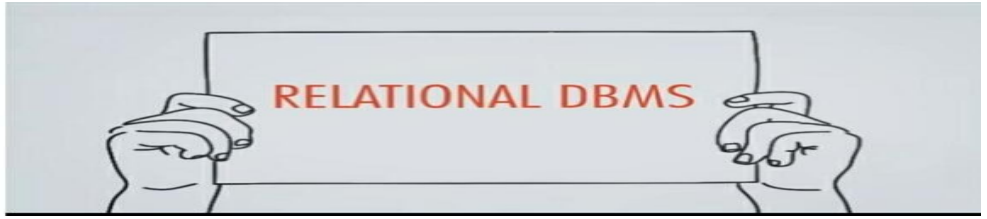
Types of Data model

Connection of different computers is called network. Network database model are similar To hierarchical database differ with one key that in network database one node can have Relationship with multiple entities.
Example data in different files and using network model to integrate or combine with eachother

- Manly used on a large network of computer
- Network (DBMS) uses network structure to create relationship with entities



Types of Data model



Relational DBMS is the most widely used DBMS model because it is one of the easiest. This model is based on normalizing data in the rows and columns of the tables.Rows represent record and column attributes

Reason to most effective from other database

- Database Can be used easily with little or no traning
- One can easily modified database entities

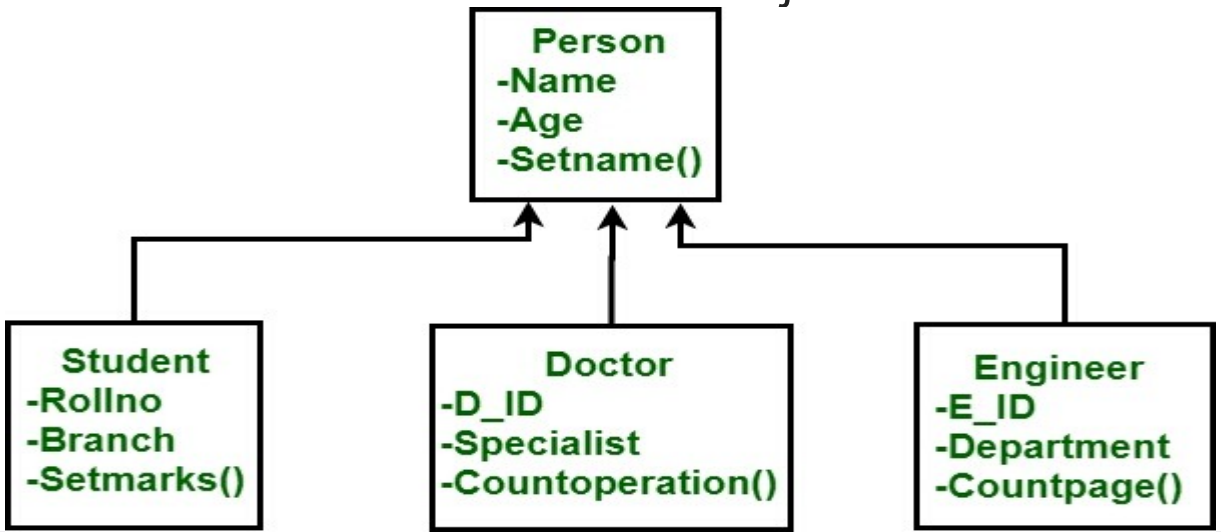
student_id	name	age
1	Akon	17
2	Bkon	18
3	Ckon	17
4	Dkon	18

subject_id	name	teacher
1	Java	Mr. J
2	C++	Miss C
3	C#	Mr. C Hash
4	Php	Mr. P H P

student_id	subject_id	marks
1	1	98
1	2	78
2	1	76
3	2	88

Types of Data model

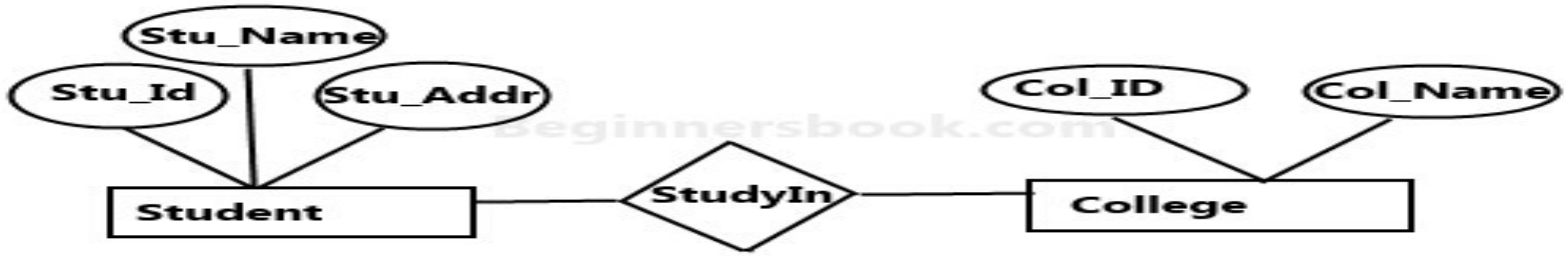
In Object-oriented Model data stored in the form of objects. The structure which is called classes which display data within it. It defines a database as a collection of objects which stores both data members values and operations.



Types of Data model

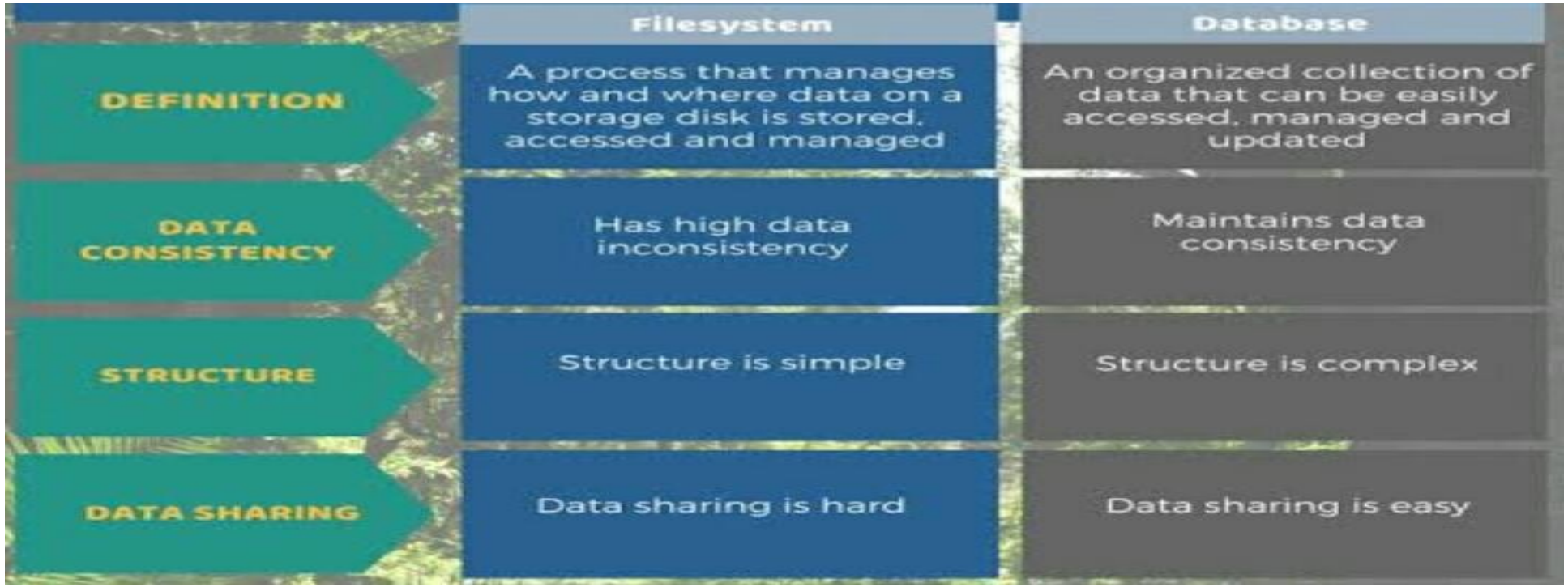
Entity-Relationship Model

- An **Entity–relationship** model (**ER** model) describes the structure of a database with the help of a diagram, which is known as **Entity Relationship** Diagram (**ER** Diagram).
  An **ER** model is a design or blueprint of a database that can later be implemented as a database.



Sample E-R Diagram

Comparison between File system and Database system



	Filesystem	Database
DEFINITION	A process that manages how and where data on a storage disk is stored, accessed and managed	An organized collection of data that can be easily accessed, managed and updated
DATA CONSISTENCY	Has high data inconsistency	Maintains data consistency
STRUCTURE	Structure is simple	Structure is complex
DATA SHARING	Data sharing is hard	Data sharing is easy

Comparison Between File system and Database system

Architecture Of Database System

The Three-Tier Architecture

The Three Tier Architecture

Architecture Of Database System

A 3-tier application is an application program that is structured into three major parts; each of them is distributed to a different place or places in a network. These three. divisions are as follows:

- The workstation or presentation layer
- The business or application logic layer
- The database and programming related to managing layer

Data Independence

The ability to modify a schema defination in one level without affecting a schema defination in the next higher level is called data independence
Data independence helps us to keep data Separated from all program That make use of it

Types of data independence

- Pysical data Independence
- Logical data independence
-
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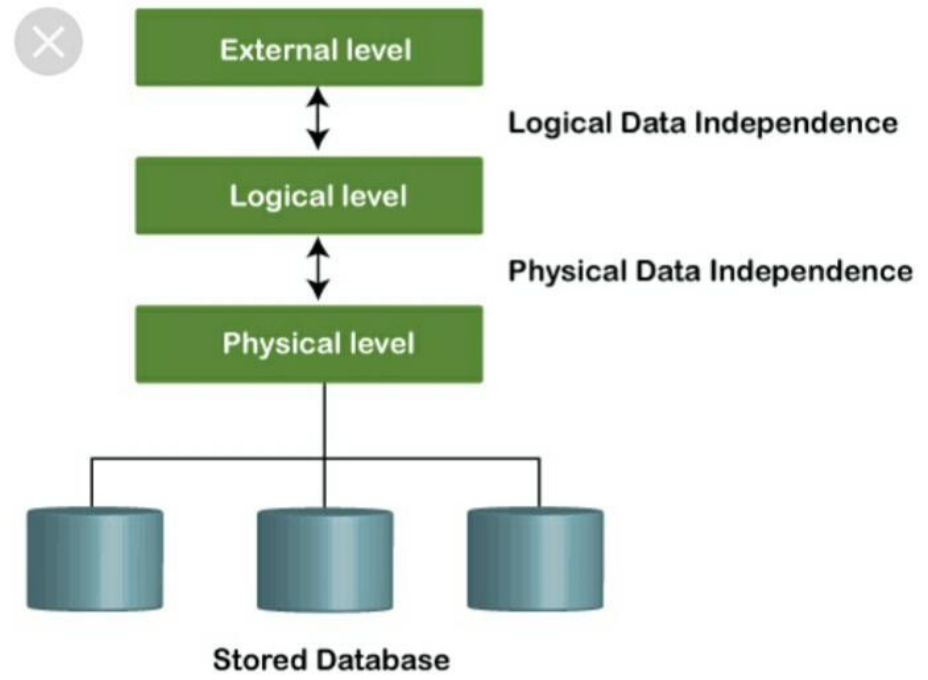


Data Dictionary

A **data dictionary** is a collection of the names, **definitions**, and attributes for **data** elements and models. The **data** in a **data dictionary** is the metadata about the **database**. These elements are then used as part of a **database**, research project, or information system. ... Physical information about where **data** is stored.

There are two type of data dictionary

- _Active data dictionary
- Passive data dictionary

Database Administrator (DBA)

- A **Database Administrator** (**DBA**) is individual or person responsible for controlling, maintenance, coordinating, and operation of **database** management system. ... Their role also varies from configuration, **database** design, migration, security, troubleshooting, backup, and data recovery

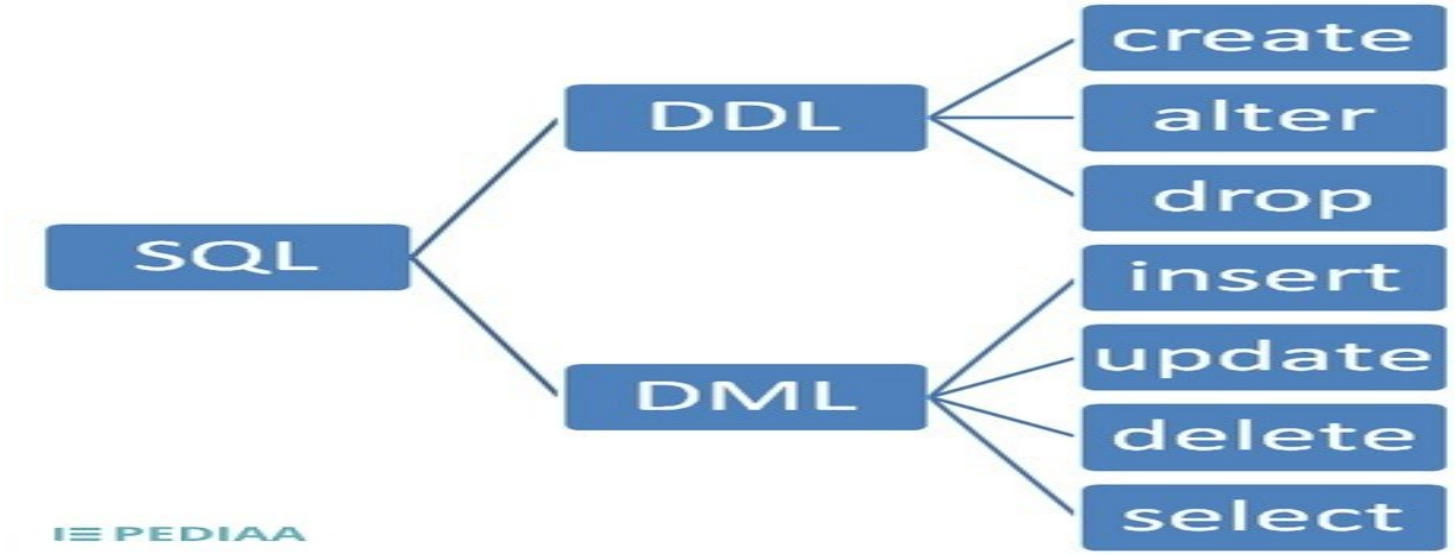
Primary key

- A **primary key** is a column or a set of columns in a table whose values uniquely identify a row in the table. A relational **database** is designed to enforce the uniqueness of **primary keys** by allowing only one row with a given **primary key** value in a table

Customer ID	Forename	Surname
1	Simon	Jones
2	Emma	Price
3	Laura	Jones
4	Jonathan	Hale
5	Emma	Smith

Simple primary key

Data definition Language And Data Manipulation Language



Data Definition Language

- **DDL** is **Data Definition Language** which is used to **define data** structures. For example: create table, alter table are instructions in SQL.

Data definition Language And Data Manipulation Language

Data Manipulation Language.

- **DML**: **DML** is **Data Manipulation Language** which is used to **manipulate data** itself. For example: insert, update, delete are instructions in SQL.