DATABASE MANAGEMENT SYSTEM

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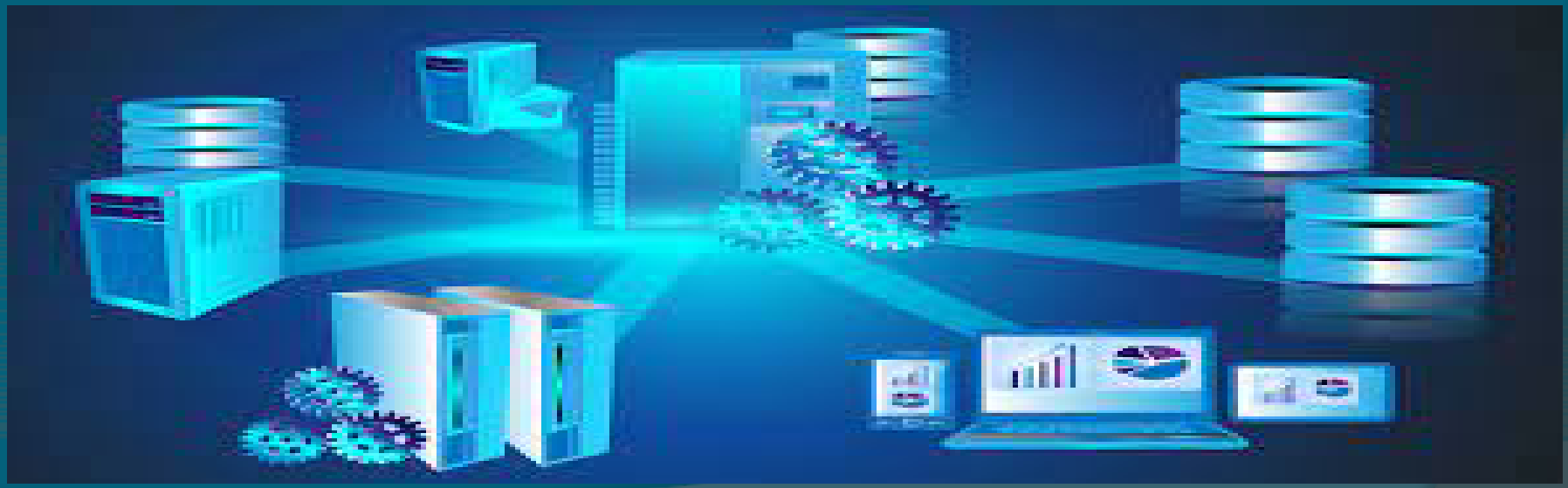
What is database ?

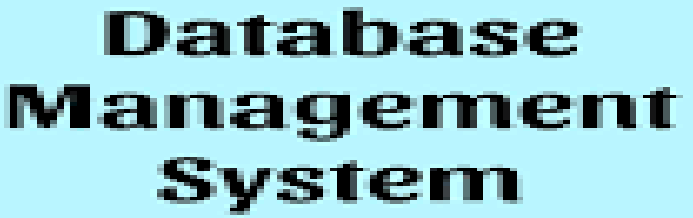
- A database is collection of related data which represents some aspect of the real world.

- A database system is designed to be build and populated with data for a certain task.



What is DBMS ?

- DBMS stands for Database Management System.
- Database Management system is a software for storing and retrieving users data while considering appropriate security measures.
- It consists of a group op programs which manipulate the database.



History of Database Management System :

1960 – Charles Bachman designed first DBMS
1970 – Codd introduced IBM's Information Management System
1976 – Peter Chen coined and defined the Entity-relationship model also know as the ER model
1980 – Rational Model becomes a widely accepted database component
1985 – Object – oriented DBMS develops
1990s – Incorporation of object orientation in related DBMS
1991 – Microsoft ships MS access , a personal DBMS and that displaces all other personal DBMS products.
1995 – First internet database applications
1997 – XML applied to database processing . Many vendors begin to integrate xml into DBMS products.

Characteristics of DBMS :

- Provides security and removes redundancy
- Self-describing nature of a database system
- Insulation between programs and data abstraction
- Support of multiple views of the data
- Sharing of data and multi user transaction processing
- It follows the ACID concept(Atomicity, Consistency, Isolation and Durability)
- DBMS supports multi-user environment that allows users to access
- manipulation data in parallel.

DBMS vs FFMS ;

DATABASE MANAGEMENT SYSTEM	FLAT FILE MANAGEMENT SYSTEM
Multi-user access	It does not support multi-user access
Design to fulfill the need for small and large business	It is only limited to smaller DBMS system
Remove redundancy and integrity	Redundancy and integrity issues
Expensive	Cheaper
Easy to implemented complicated transaction	No support for complicated transactions

Users of DBMS :

- Following are the various category of users of DBMS
  - Application programmers
  - Database Administrators
  - End users

Popular DBMS Software :

Here is the list of some popular DBMS system

- ✔My SQL
- ✔Microsoft Access
- ✔Oracle
- ✔postgreSQL
- ✔Dbase
- ✔Foxpro
- ✔SQLite
- ✔IBM DB2
- ✔Libreoffice base
- ✔MariaDB
- ✔Microsoft SQL server etc

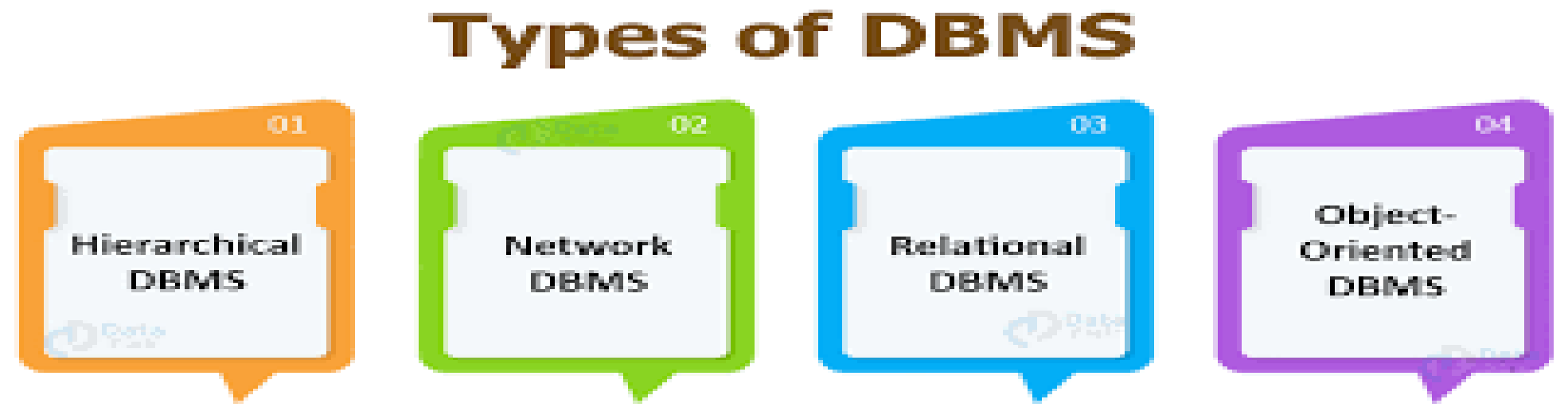
Applications of DBMS :

Below are the popular database system applications

- BANKING – For customer information , account activities , payments, ` ` , deposits, loans etc
- AIRLINE – For reservation and schedule information
- UNIVERSITIES –For students information, course registration , colleges and grades
- SALES – Use for storing customer , product and sales information
- TELECOMMUNICATION – It helps to keep call records, monthly bills, maintaining balance , etc
- FINANCE – For storing information about stock, sales and purchases of financial instruments like stocks and bonds
- HR MANAGEMENT - For information about employees , salaries , payroll, deduction, generation of paychecks

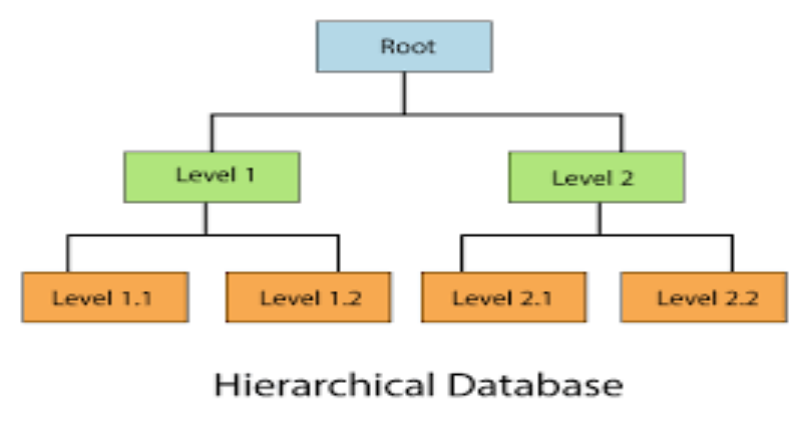
Types of DBMS :

- ❖Hierarchical database
- ❖Network database
- ❖Relational database
- ❖Object-Oriented database



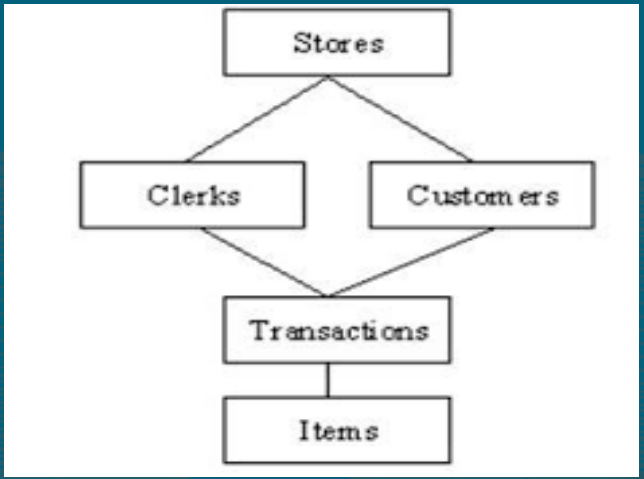
Hierarchical DBMS :

- In a hierarchical database model data is organized in a tree-like structure.
- Data is stored Hierarchical (top down or bottom up) format.
- Data is represented using a parent-child relationship.
- In Hierarchical DBMS parent may have many children but children have only one parent



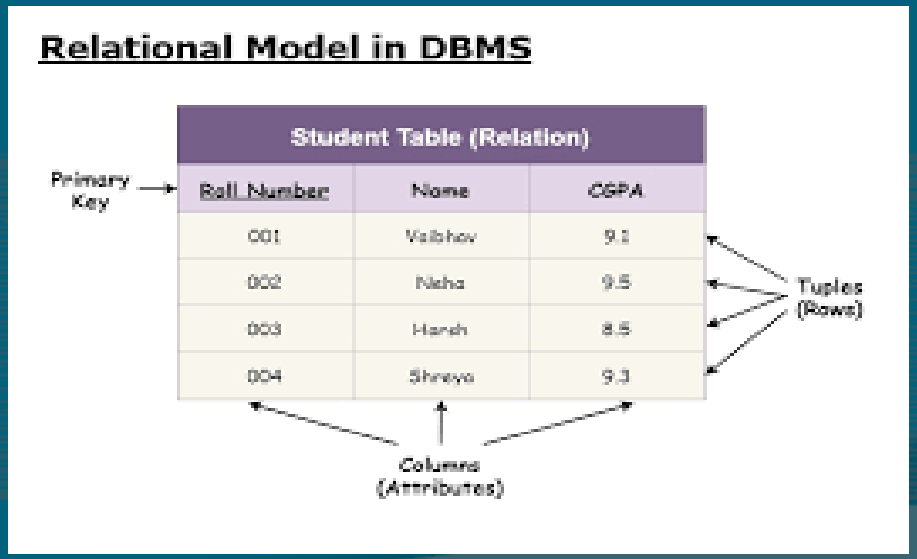
Network model :

- The network database model allows each child to have multiple parents.
- It helps you to address the need to model more complex relationships like as the orders/parts many to many relationships.
- In this model, entities are organized in a graph which can be accessed through sevarel paths



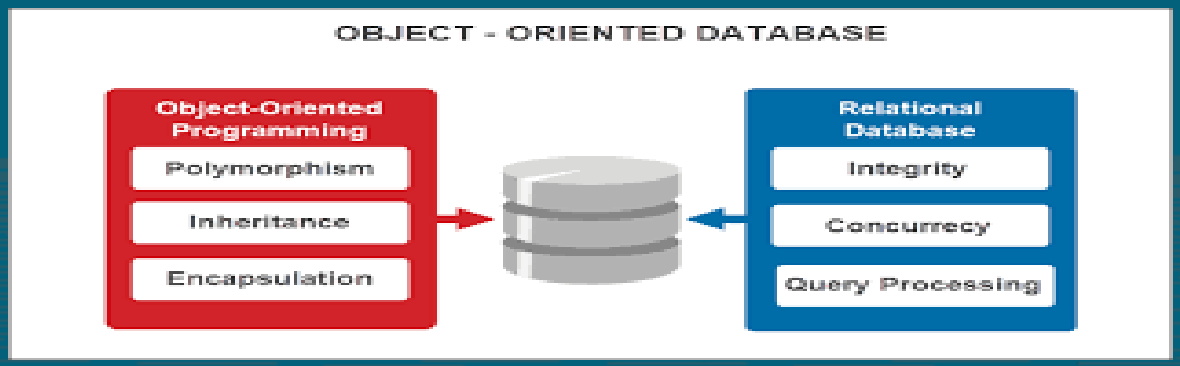
Relational model :

- Relational DBMS is the most widely used DBMS model because it is one of the easiest.
- This model is band on normalized data in the rows and columns of the tables.
- Relational model stored in fixed structure and manipulated using SQL

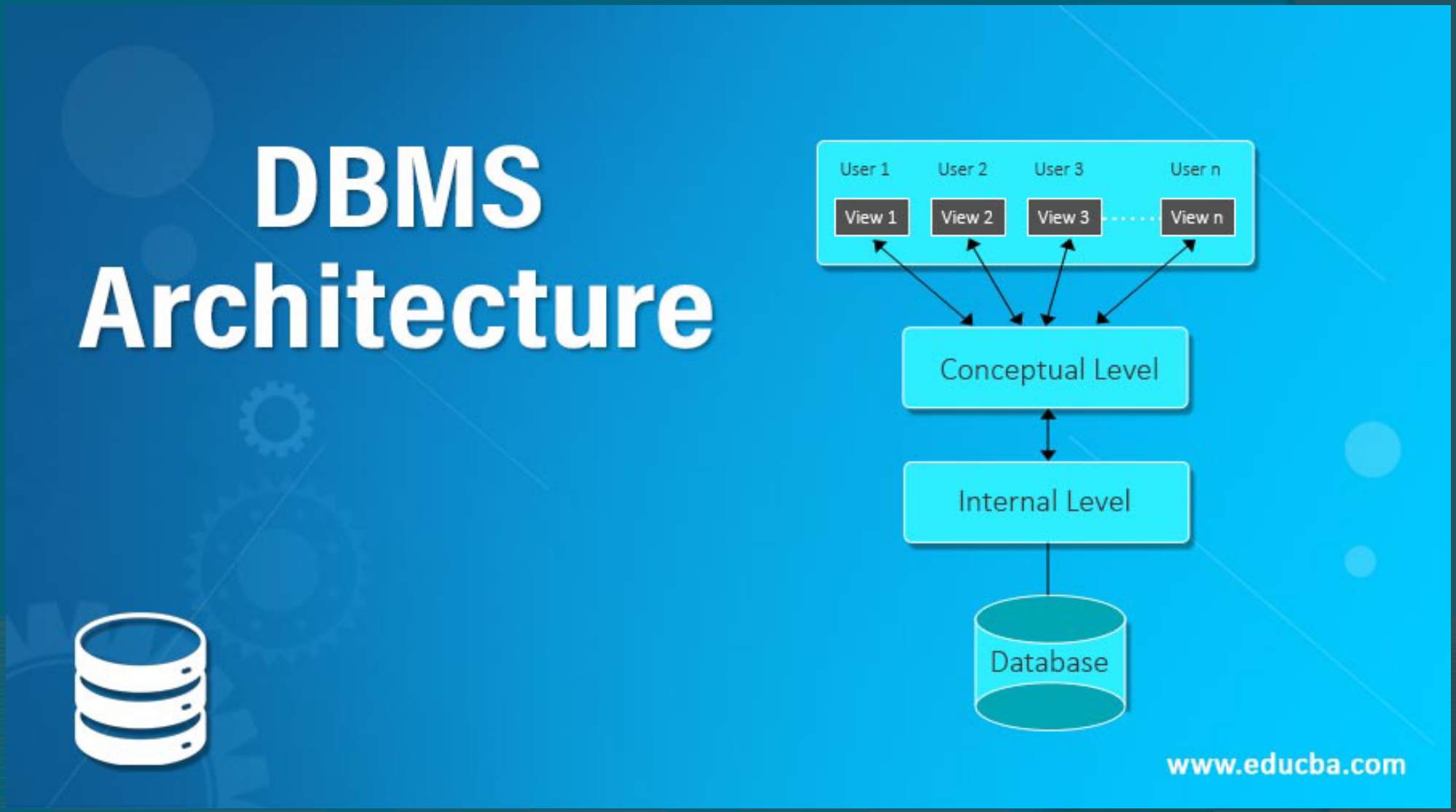


Object-Oriented Model :

- In Object-Oriented model data stored in the form of object.
- The structure which is called which display data within it.
- It is one of the components of DBMS that defines a database as a collection of object which stores both data members values and operations



Architecture of DBMS



Advantage of DBMS :

- Controlling redundancy
- Sharing of data
- Data consistency
- Integration of data
- Integration constraints
- Data security
- Back up and recovery procedures

Disadvantage of DBMS :

- Cost of hardware and software
- Cost of data conversation
- Appointing technical staff
- Database damages

DBMS Languages :

Data Definition Languages- DDl ;

Data Definition Languages statements are used to define the database structure

Some of the examples :

CREATE – To create objects in the database
ALTER - alter the structure of the database
DROP - delete objects from the database
COMMENT – add comments to the data dictionary
RENAME- rename an object
TRUNCATE – remove all records from a table , including all spaces allocated for the records are removed

Data Manipulation language (DML) :

Data manipulation language statements are used for managing data without schema object

Some of examples :

- SELECT – retrieve data from the database
- INSERT – insert data into a table
- UPDATE – updates exiting data within a table
- DELETE – delete all records form a table, the space for the records
- MERGE – UPSERT operation
- CALL – call a pl/sql or java subprogram
- LOCK TABLE – control concurrency