

Actors on scene:

1. DataBase Administrator (DBA)
2. Database designers
3. End users
 - Casual end users
 - Naïve/Parametric end users
 - Sophisticated end users
 - Stand-alone users
4. System analysts, Application Programmers, Software Engineers.

① DATABASE ADMINISTRATOR (DBA)

This is the chief administrator, who oversees and manages the database system (including data & software). He performs no. of crucial tasks. He must be on call all time when a problem does arise.

Duties / Roles / Functions / Responsibilities of DBA

1. Generate database application performance reports
2. Investigate user performance complaints
3. Modify database structure such as tables, indexes.
4. Evaluate and implement new database management features

5. Tune Database

6. Database planning

7. Policies and procedures

8. Logical/Conceptual database design

9. Security, Integrity & control

10. Maintain OS

11. Enrolling new users

12. Helping load/unload data

13. Make data easily ACCESSIBLE when required.

14. Planning future storage requirements.

15. Data Repository (is a logical partitioning of data where multiple databases which apply to specific applications).

16. Data Replication (Process of storing data in more than one site or node. This is necessary for improving availability of data).

17. Creating primary objects once application developers have designed an application.

18. Creating primary database storage structures (table spaces) once application developers have designed an application.

19. Installing, upgrading, configure the oracle database

server and application tools

20. Primary role is to protect files from loss or corruption.

21. Maintains backups and recovery.

→ Backups can be used to restore & recover data that has been lost through server failure but different errors may need different recovery strategies. So, DBA must be alert to the dangers.

* DBA is a single person in organization with final responsibility and authority for database setup, use and maintenance.

② DATABASE DESIGNERS

* They are responsible for identifying data to be stored and for choosing an appropriate way to organize it.

* They also define views for different categories of users.

* Final design must be able to support the requirements of all user subgroups.

3) END USERS: These are the persons who access the database for querying, updating and report generation.

* They are main reason for database's existence

→ Some of the users are:

(i) Casual end users:

* These use database occasionally, needing different information each time; use query language to specify their requests; typically middle or high level managers

(ii) Naive/Parametric end users:

* Typically biggest group of users; frequently query/update the database using standard canned transactions that have been carefully programmed and tested in advance.

Examples:

- Bank tellers check account balances, post deposits/withdrawals.
- Reservation clerks for airlines, hotels etc checks availability of seats/rooms & make reservations.
- Shipping clerks (eg. at UPS) use buttons, bar code scanners etc to update status of packages.

(iii) Sophisticated end users: Engineers, scientists, business analysts who implement their own applications to meet their complex needs.

(iv) Stand alone users: Use "personal" databases, possibly employing a special purpose (ex: financial).

* Mostly maintain personal databases using ready-to-use packaged applications.

(4) SYSTEM ANALYSTS, APPLICATION PROGRAMMERS, SOFTWARE ENGINEERS:

* System analysts: Determine needs of end users; especially naive and parametric users and develop specifications for canned transactions that meet these needs.

* Application programmers: Implement, test, document, and maintain programs that satisfy the specifications.

* SOFTWARE ENGINEERS: Used to write the programs in order to access database efficiently.

WORKERS BEHIND THE SCENE

1. DBMS system designers/ implementors
2. Tool developers
3. Operators & maintenance personnel

① DBMS system designers/ implementors;

Provide DBMS software that is at foundation of all this.

② Tool Developers:

Design and implement software tools facilitating database system design, performance monitoring, creation of GUI, prototyping etc.

③ Operators and maintenance personnel:

Responsible for day-to-day operation of the system.

Brief Introduction of Data Models

- (4) (i) Explain data model & list the data models used. (3M)
(ii) What is a data model? Discuss various data models. (8M)
(iii) What are different data models present? Explain briefly. (8M)

(A) Data Models:-

A data model is a collection of concepts that can be used to describe the structure of a database and provides the necessary means to achieve this abstraction. Whereas structure of the database means data types, relationships and constraints that should hold on the data.

Types of Data Models:-

Data Models are categorized into three types.

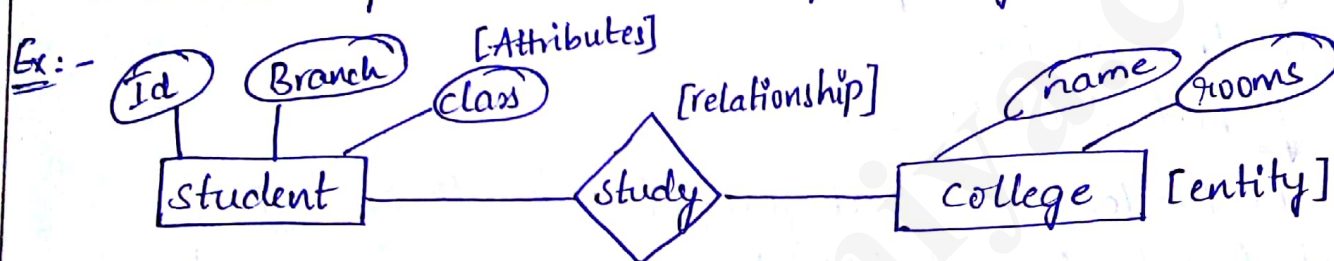
1. Object-based Logical Models
2. Record-based Logical Models
3. Physical Models.

1. Object-based Logical Models:-

They are used in describing data at the logical and view levels. They are ~~not~~ characterized by the fact that they provide fairly flexible structuring capabilities and allow data constraints to be specified explicitly. The data is stored in object form. There are many different models and more are likely to come.

1. The ER Model
2. The Object oriented Model
3. The Semantic data Model
4. The Functional data Model.

- Entity Relationship Model is based on perception of a real world that consists of a collection of basic objects called Entities and Relationships among these objects.
- The structure of database can be expressed by an ER diagram.
 - Entity is an object / Group of objects is an Entity
 - 'Rectangles' represent entity set.
 - characteristics of Entities is an Attribute
 - 'Ellipses' represent Attributes.
 - 'Diamond' represent relationship among entities.



2. Object-Oriented Model:-

- Like ER Model, the object oriented model is based on a collection of objects. Object contains values stored in instance variables within the object.
- Classes:- collection of objects which consist of same type of values and methods.

3. Semantic Model:-

- These include the extended relational, semantic network and functional models.
- These are characterized by richer facilities for capturing the meaning of data objects and maintaining database integrity.

4. Functional Model:-

- In this Model, the operations are performed based on the predefined functions.

Record-based Logical Models:-

- Record based Logical Models are also used in describing data at the logical and view levels.
- Record-based models are so named because the database is structured in fixed-format records of several types. Each record type defines a fixed number of fields, or attributes, and each field is usually of a fixed length.

1. Relational Model
2. Network Model
3. Hierarchical Model.

1. Relational Model:-

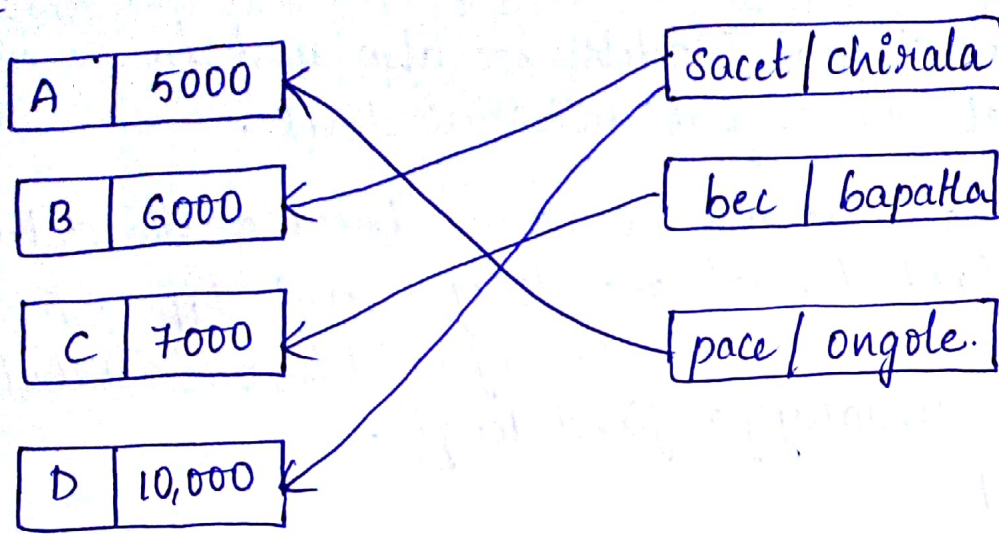
- Relational Model uses a collection of tables to represent both data and relationships among those data.

Ex:- Student Table.

st-Id	st-Name	st-Branch	st-section	st-year
5C1	P. Swathi	CSE	C	3
5C2	P. Ajay	CSE	C	3
5C3	P. Deepika	CSE	C	3
5C4	P. Rajeswari	CSE	C	3
5C5	P. Parankalyan	CSE	C	3

2. Network Model:-

- Data in the network model is represented by collection of records, and relationship among databases is represented by links. Links are viewed as pointers. The records in the database are organized as collection of arbitrary graphs.



3. Hierarchical Model:-

The Hierarchical Model is similar to the network model in the sense that data and relationships are represented by records and links. It differs from network model, in that records are organized as collection of trees rather than arbitrary graphs.

