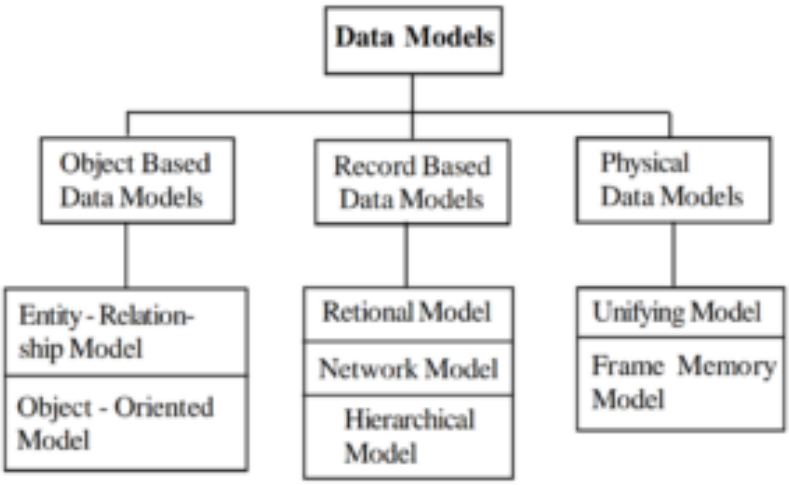
Data Model:

- ★ A data model is a collection of high-level data description constructs that hide many low-level storage details.
- ★ A DBMS allows a user to define the data to be stored in terms of a data model.
- ★ Data models define how the logical structure of a database is modeled.
- ★ They are fundamental entities to introduce abstraction in a DBMS.
- ★ They define how data is connected to each other and how they are processed and stored inside the system.
- ★ The very first data model could be flat data models, where all the data used are to be kept in the same plane.

Types of Data Model:

- ★ Data models are classified into Object Based, Record Based and Physical data models as shown in the figure.



Object Based Data Models:

- ★ These models are used to describe data and its relationships.
- ★ It uses concepts such as entities, attributes and relationships.
- ★ Common types of object-based data models are Entity-Relationship (E-r),Object Oriented.

Record Based Data Models:

- ★ These models specify the overall logical structure of the database and provides a higher-level description of the implementation.
- ★ They are so named because the database is structured in fixed format records of several types.
- ★ The most widely accepted record based data models are Hierarchical model, Network model and Relational model.

Physical Data Models:

- ★ They describe how data is stored in the computer, representing information such as record structures, record ordering, and access paths.
- ★ The models that come under this category are Unifying model and Frame memory model.

Relational Model:

- ★ Designed by E.F.Codd.
- ★ Relational model stores data in the form of tables.
- ★ Each table contains records of a particular type.
- ★ Each record type defines a fixed number of fields, or attributes.
- ★ The columns of the table correspond to the attributes of the record types.

The relational model consists of three major components:

1. The set of relations and set of domains that defines the way data can be represented (data structure)
2. Integrity rules that define the procedure to protect the data (data integrity)
3. The operations that can be performed on data (data manipulation)

The main highlights of this model are:

- ★ Data is stored in tables called relations.
- ★ Relations can be normalized means minimizing redundancy in tables and eliminate undesirable characteristics that occur during data manipulation.
- ★ In normalized relations, values saved are atomic values.
- ★ Each row in a relation contains a unique value.
- ★ Each column in a relation contains values from a same domain.