

DBMS Basis

Codd's Rules (13 rules based on which the relation DB models are created)

Types of databases :

Data models: Framework used to represent data, relationships, constraints and rules within DBMS

Relational

Theoretical

Logically stored in structures format e.g. tables

Use SQL for interacting with the DB

Entity Relational

Systematic tool to plan all the data requirements

Entity : represent object (tables)

Entity

Weak Entity - An entity that relies on another entity

e.g.

Attribute: Describe entity (Columns)

Key - Can be used as a unique identifier eg. Student_ID

Composite - not atomic in nature and be divided further eg. Name(FirstName, LastName)

Multivalued - Contains more than one value eg. Phone No.

Derived - Derived from other attribute eg. Age(derived from date of birth)

Relationship: How 2 entity are related (links)

1:1 - When a single element of an entity is associated with a single element of another entity eg. Student and ID-card

1:M - When a single element of an entity is associated with more than one element of another entity eg. Emp - Project

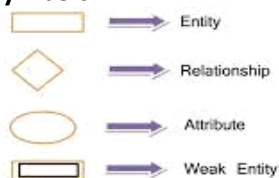
M:1 - When more than one element of an entity is associated with a single element of another entity eg. Emp - Dept

M:M - When more than one element of an entity is associated with more than one element of another entity eg. Student - Courses

Why(Uses)

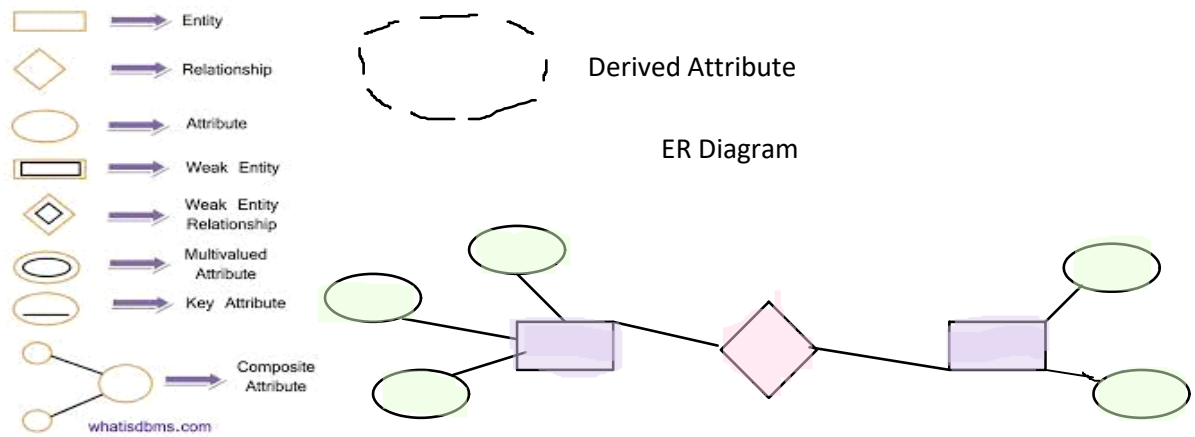
- Help conceptualize database
- Provides better understanding of information to be stored in the database
- Reduces complexity
- Helps to describe elements using Entity Relationship model
- It allows users to get a preview of the logical structure of the database

Symbols:



Derived Attribute

ER Diagram



Need:

Data Complexity, data redundancy, data integrity, effective communication, query optimization

Object based

Semi structured

Normalization

Is the process of reorganizing the data within a database so the users can utilize it for further query and processing.

Divides the larger table into smaller tables and links them using relationships, in order to organize the data in the database and reduce redundancy, data anomalies.

The most basic normal form of data normalization is 1NF which ensures that there are no two same entries in a row.

1NF - Eliminate repeating groups

Each cell should contain a single value. (All values should be atomic.)

Each record should be unique

2NF - Eliminate partial functional dependency

All the subsets of data that can be placed in multiple rows are placed in separate tables.

The primary key should not be functionally dependent on any subset of candidate keys.

3NF - Eliminate Transitive dependency

Change in one column should not impact any other column

It should not have any transitive functional dependency

4NF - Eliminate multi-value dependency

5NF - Eliminate join dependency

BCNF Boyce Codd normal form

Advanced form of 3NF

