**Entity Relationship Diagram – ER Diagram in DBMS**

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. The main components of ER model are: entity set and relationship set.

What is an **Entity Relationship Diagram** (ER Diagram)?

An ER diagram shows the relationship among entity sets. An entity set is a group of similar entities and these entities can have attributes.

Lets have a look at a simple ER diagram to understand this concept.

Facts about ER Diagram Model:

ER model allows you to draw Database Design

It is an easy to use graphical tool for modeling data

Widely used in Database Design

It is a GUI representation of the logical structure of a Database

It helps you to identifies the entities which exist in a system and the relationships between those entities

ER diagrams are translatable into relational tables which allows you to build databases quickly

A simple ER Diagram:

**Rectangle**: Represents Entity sets.

**Ellipses**: Attributes

**Diamonds**: Relationship Set

**Lines**: They link attributes to Entity Sets and Entity sets to Relationship Set

**Double Rectangles**: Weak Entity Sets

Components of a ER Diagram

As shown in the above diagram, an ER diagram has three main components:

1. **Entity**

2. **Attribute**

3. **Relationship**

**Entity**

An entity is an object or component of data..

**Weak Entity**:

An entity that cannot be uniquely identified by its own attributes and relies on the relationship with other entity is called weak entity. The weak entity is represented by a double rectangle. A weak entity can be identified uniquely by considering the primary key of another entity.

In the ER diagram the relationship between two strong entity set shown by using a diamond symbol.

The relationship between one strong and a weak entity set shown by using the double diamond symbol.

2. **Attribute**

An attribute describes the property of an entity. An attribute is represented as Oval in an ER diagram. There are four types of attributes:

**Key attribute**:

A key attribute can uniquely identify an entity from an entity set. Key attribute is represented by oval same as other attributes however the text of key attribute is underlined.

3. **Relationship**

Cardinality: Defines the numerical attributes of the relationship between two entities or entity sets.

There are four types of cardinal relationships:

1. One to One

2. One to Many

3. Many to One

4. Many to Many

1. **One to One Relationship**

When a single instance of an entity is associated with a single instance of another entity.

2. **One to Many Relationship**

When a single instance of an entity is associated with more than one instances of another entity.

3. **Many to One Relationship**

When more than one instances of an entity is associated with a single instance of another entity.

4. **Many to Many Relationship**

When more than one instances of an entity is associated with more than one instances of another entity

Summary

* The ER model is a high-level data model diagram
* ER diagrams are a visual tool which is helpful to represent the ER model
* Entity relationship diagram displays the relationships of entity set stored in a database
* ER diagrams help you to define terms related to entity relationship modeling
* ER model is based on three basic concepts: Entities, Attributes & Relationships
* An entity can be place, person, object, event or a concept, which stores data in the
* database
* Relationship is nothing but an association among two or more entities
* A weak entity is a type of entity which doesn't have its key attribute