**Introduction of ER Model**

* The entity relational model is a model for identifying entities to be represented in the database and representation of how those entities are related.
* The ER data model specifies enterprise schema that represents the overall logical structure of a database graphically.
* The entity relationship diagram explains the relationship among the entities present in the database.
* ER models are used to model real-world objects like a person, a car, or a company and the relation between these real-world objects.
* In short, ER Diagram is the structural format of the database.

**Why Use ER Diagram In DBMS?**

* ER diagrams are used to represent the ER model in a database, which makes them easy to be converted into relations (tables).
* ER diagrams provide the purpose of real-world modeling of objects which makes them intently useful.
* ER diagrams require no technical knowledge and no hardware support.
* These diagrams are very easy to understand and easy to create even for a naïve user.
* It gives a standard solution for visualizing the data logically.

**Components of ER Diagram**

* ER Model consists of Entities, Attributes, and Relationships in a Database System.

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# **Entity**

* An Entity may be an object with a physical existence – a particular person, car, house, or employee – or it may be an object with a conceptual existence – a company, a job, or a university course.

1. **Strong Entity**

* A Strong Entity is a type of entity that has a key Attribute.
* Strong Entity does not depend on other Entity in the Schema.
* It has a primary key, that helps in identifying it uniquely, and it is represented by a rectangle.
* These are called Strong Entity Types.

1. **Weak Entity**

* An entity that depends on another entity called a weak entity.
* The weak entity doesn't contain any key attribute of its own.
* The weak entity is represented by a double rectangle.
* These are called Weak Entity types.

# **Attribute**

* Attributes are the properties that define the entity type.
* For example, Roll No, Name, DOB, Age, Address, and Mobile No are the attributes that define entity type Student.
* In ER diagram, the attribute is represented by an oval.

1. **Key Attribute**

* The attribute which uniquely identifies each entity in the entity set is called the key attribute.
* For example, Roll No will be unique for each student.
* In ER diagram, the key attribute is represented by an oval with underlying lines.

1. **Composite Attribute**

* An attribute composed of many other attributes is called a composite attribute.
* For example, the Address attribute of the student Entity type consists of Street, City, State, and Country.
* In ER diagram, the composite attribute is represented by an oval comprising of ovals.

1. **Multivalued Attributes**

* An attribute consisting of more than one value for a given entity.
* For example, Phone No (can be more than one for a given student).
* In ER diagram, a multivalued attribute is represented by a double oval.

1. **Derived Attributes**

* An attribute that can be derived from other attributes of the entity type is known as a derived attribute. e.g.; Age (can be derived from DOB).
* In ER diagram, the derived attribute is represented by a dashed oval.

# **Relationship**

* A relationship is used to describe the relation between entities. Diamond or rhombus is used to represent the relationship.