**ER MODALS**

Entities

Businesses store information about their main components such as customers, suppliers, products, sales, orders, stores, employees, promotions, etc. An E-R model maps these real-world objects into entities such as customer, student, employee, user, product, department, etc.

An entity defines the object about which the information is stored in a database. It is important for a business to understand what are its main components about which the information is necessary to the business. An E-R model describes these business components as entities.

Attributes

Attributes in an E-R model represent the properties of a real-world object. For example, a particular product’s properties, such as name, weight, type, category, size, brand, etc. Attributes in an E-R model store such properties of every entity. They define what information is required regarding a business entity.

Attribute

Entity

**Relations In ER Models**

[**https://www.smartdraw.com/entity-relationship-diagram/#:~:text=An%20entity%20relationship%20diagram%20(ERD)%20shows%20the%20relationships%20of%20entity,object%2C%20a%20component%20of%20data.&text=By%20defining%20the%20entities%2C%20their,the%20logical%20structure%20of%20databases**](https://www.smartdraw.com/entity-relationship-diagram/#:~:text=An%20entity%20relationship%20diagram%20(ERD)%20shows%20the%20relationships%20of%20entity,object%2C%20a%20component%20of%20data.&text=By%20defining%20the%20entities%2C%20their,the%20logical%20structure%20of%20databases)**.**

* one-to-one
* one-to-many
* many-to-many

[**https://cloud.smartdraw.com/?nsu=1**](https://cloud.smartdraw.com/?nsu=1)

**Cardinality**

**Optional Participation (CAN)**:For example team may or may not have project (They are on bench)

Or A project may or may not have team.

**Mandatory Participation (MUST)** : A team must handle a project Or Project must be handled

By at least one team.

**Maximum Cardinality:** Many to Many then it is N

As discussed in the video, we learnt about the following points regarding the concept of Cardinality:

* Cardinality defines participation of each entity in the relation. The minimum and maximum cardinality of each entity in the relation can be different.
* Minimum cardinality defines the minimum participation of an entity in a relation.
* Maximum cardinality defines the maximum participation of an entity in a relation.
* If the minimum cardinality is 0, then every row of an entity may or may not have a corresponding row in another entity. This means that a team may or may not manage any project.
* If the minimum cardinality is 1, then every row of the entity must have a corresponding row in another entity. This means that every team must manage at least one project.
* If the maximum cardinality of entity A is 1, then it means that for any number of rows of entity B, there will be a maximum of one corresponding row in entity A.
* If the maximum cardinality of entity A is N, then it means there can be many rows of entity A that are related to a single row of entity B.
* The maximum cardinality of an entity that is on the 'one' side of a one-to-many relation is 1.
* The maximum cardinality of an entity that is on the 'many' side of a one-to-many relation is N.

<https://www.techopedia.com/definition/18/cardinality-databases>  
Link for further studies

**SUMMARY**

This session introduces the role of data models in database designing and explains in detail the entities, attributes, degree of relation and cardinality. Let us summarise what we learnt in this session:

* An E-R model is the logical schema that identifies various important entities; the relations between those entities; and the attributes of each entity for a business database.
* A Ternary relation connects three different entities.
* Minimum cardinality defines whether participation of an entity in a relation is optional or mandatory.
* Entities are those business concepts about which a company collects data.
* If the maximum cardinality of both the entities in a relation is 1, then the degree of relation is one-to-one.
* Attributes are the properties of entities. They define what data must be known for each entity.
* If the maximum cardinality of both the entities in a relation is N, then the degree of relation is many-to-many.
* A Unary relation or recursive relation relates one row of an entity to another.
* If the maximum cardinality of one entity is 1, whereas that of the other entity is N, then the degree of relation is one-to-many.
* A Binary relation connects two different entities.