Chapter 1-
EER Modeling

Course Code: CIS 322

Module Title: Advanced Database

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Database Design

"The process of creating a design that will support the enterprise's mission statement and mission objectives for the required database system."

Phases of Database Design

- Conceptual database design

- Logical database design

- Physical database design

Phases of Database Design

- **Conceptual Database Design:**

The process of constructing a model of the data used in an enterprise, independent of all physical considerations."

- **Logical Database Design:**

"The process of constructing a model of the data used in an enterprise based on a specific data model, but independent of a particular DBMS and other physical considerations."

- **Physical Database Design:**

"The process of producing a description of the implementation of the database on secondary storage.

What is an Entity?

- An entity may be defined as a thing which an organization recognizes as being capable of an independent existence and can uniquely be identified.

- An entity will have the same set of properties.

- An object's information that will require to be hold by an information system is known as **system's entity.**

Types of Entities

Physical Entity: The information to be kept of a real world object is known as physical entity.

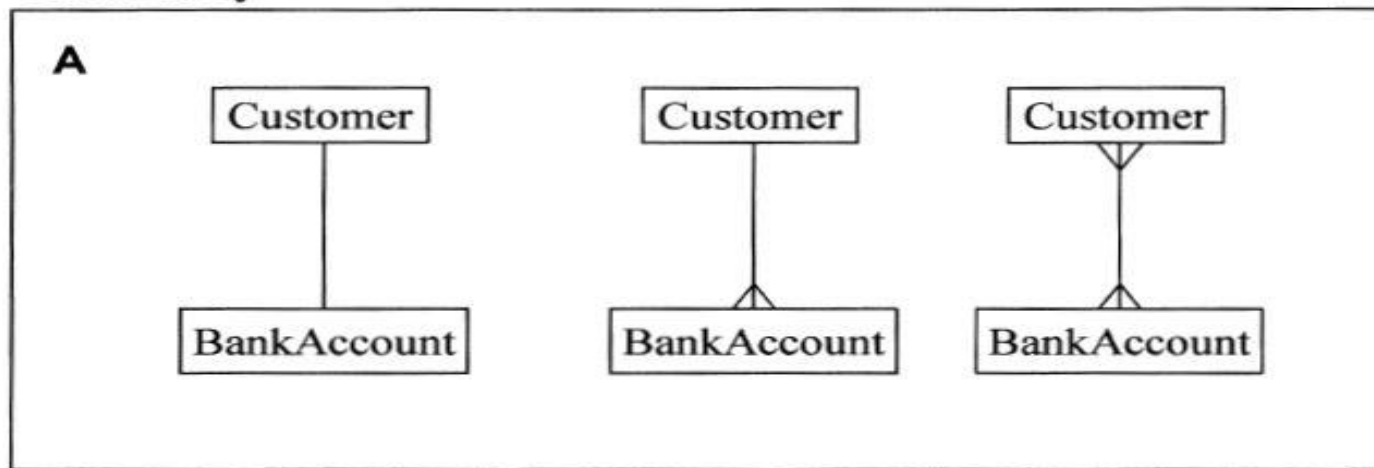**Such as** a house, a car, a student.

Conceptual Entity: The information to be kept of a concept is known as conceptual entity.

Such as an order, a transaction, a grade.

Cardinality

Cardinality/Degree of Relationship concerns the number of instances involved in a relationship. A relationship can be said to be either a 1:1(one to one) relationship, a 1:M(one-to-many) relationship, or a M:N(many to many) relationship.

Cardinality

Identifying Entities

- Examine user requirements

- Look for nouns

- Look for objects that exist in their own right e.g. Customers, staff

- Be aware of synonyms and homonyms

Example of an Art Supplier

From an interview with the manager:

"We get our goods from various suppliers. Generally we have one supplier for each item. Customers order from us. They usually order in bulk and we fill in an order form. We usually group orders in the same are into a delivery. We have three delivery vans."
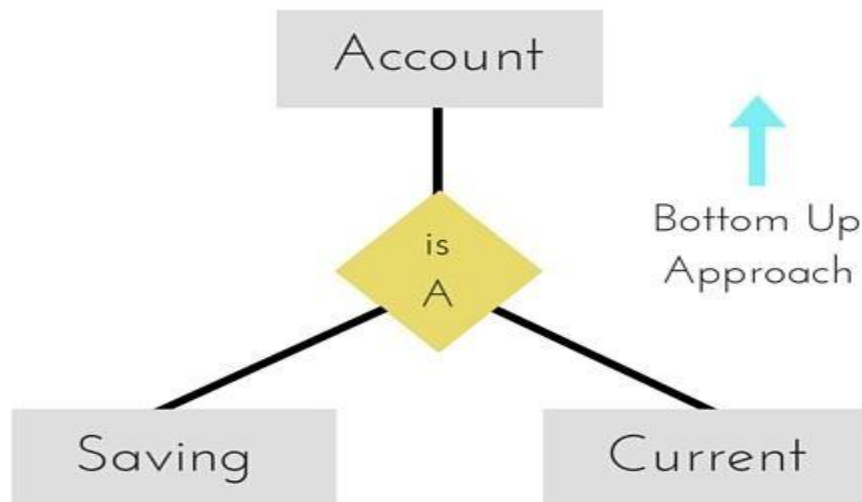
The Enhanced ER Model

Three new concepts were added to the existing ER Model, they were:
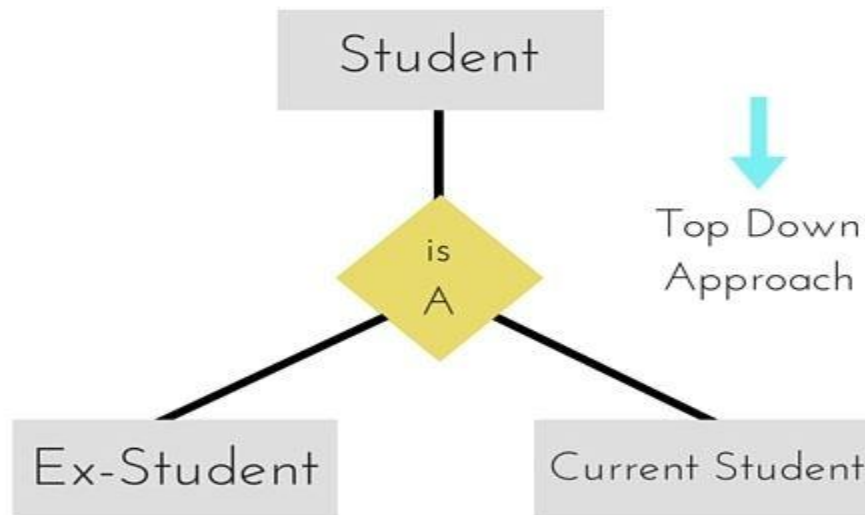
- Generalization
- Specialization
- Aggregation

Generalization

Generalization is a bottom-up approach in which two lower level entities combine to form a higher level entity. In generalization, the higher level entity can also combine with other lower level entities to make further higher level entity.

Specialization

Specialization is opposite to Generalization. It is a top-down approach in which one higher level entity can be broken down into two lower level entity. In specialization, a higher level entity may not have any lower-level entity sets, it's possible.

Aggregation

Aggregation is a process when relation between two entities is treated as a **single entity**.