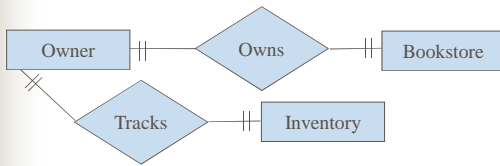


Entities

Example (Bookstore)

Mr. Miller owns a bookstore, and wants to keep track of his inventory using a database. He wants to store which books he has, and how many copies of each.



Entities

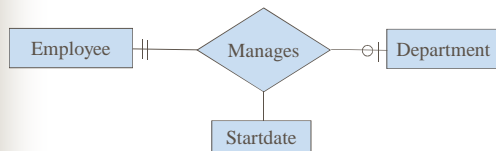
Bad example: none of the entity types should be an entity type.

Why?

An entity type should potentially have many instances: your goal is to store information on these instances.

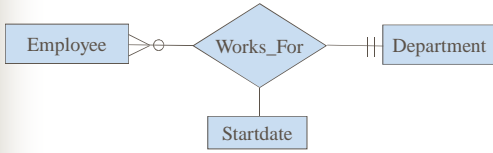
Use singular names for entities.

Attributes of Relationships



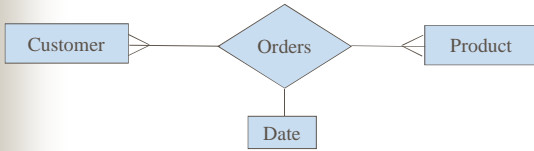
Could the attribute be placed differently?

Attributes of Relationships



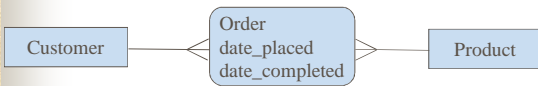
Could the attribute be placed differently?

Attributes of Relationships



Could the attribute be placed differently?

Associative Entities



Relationship versus associative entity?

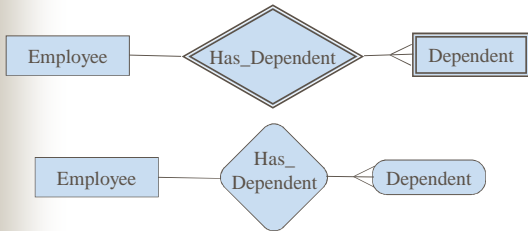
Compare to relationship design.

Weak Entity Types

- entity types without key (unique identifier)
- exist dependent on an **owner entity type**
- related by **identifying relationship**
- (**ID dependent entity**)
- drawn as double rectangular box, identifying relationship as double diamond, or by rounding edges of weak entity and identifying relation



Weak Entity Types



Weak Entity Types

- related record in the owner relationship owns weak entities related to it
- partial key** identifies records belonging to the same owner (doubly underlined)
- weak entity types have mandatory participation (reverse not true: driver license)



Multivalued Attributes via weak entities



Attributes of Relationships

See Figure 3-15, page 115.

ER Diagram Design

- Identify entities
- Identify relationships between entities
- Find attributes, identifiers; identify weak entities

Company Example Miniworld

Company consists of departments, which have unique name and number, and are managed by one employee. We need the start date of the manager. Department might be located in several locations. Departments control projects which have unique name number, and location.

For each employee we need name, SSN, address, salary, sex, and birth date. Employee belongs to one department, but can work on multiple projects in different departments. We need to store the weekly time spent by each employee on each project. Employees have supervisors.

We need the following information on dependents: first name, sex, birth date, and relationship to employee.

Big Hit Video miniworld

BigHit Video Inc. wants to create an information system for online sales of movies. People will be allowed to register as customers of the online site and to update their stored information. Information must be maintained about customers' shipping addresses, e-mail addresses, and credit cards. In a single sale, customers will be allowed to purchase any quantity of videos. The items in a single sale will be shipped to a single address and will have a single credit card charge.

A customer will be provided with a virtual shopping cart to store items to be purchased. As each item is selected, it is added to the shopping cart. When the customer finishes shopping, he will be directed to a checkout area where he can purchase all of the items in the shopping cart. At this time, payment and shipping information is entered. Once the sale is complete, shopping cart will be deleted and the customer will be sent a receipt by e-mail.

Pine Valley Furniture miniworld

See description on page 124.
