

# Database Systems

## CS204 (3+1 Credits)

Ch:7 "Data Modeling using ER model

Examples

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## ER-Modeling steps

- Identifying Entities, classify them into strong and weak
- Outline the attributes of each entity, along with a key, their data types (define types if necessary)
- Identifying relationships and their types.
- Identifying attributes for each relationships, decide for the natural place of these attributes.
- Identify the constraints for each entity and relationship. Participation Constraints and cardinality constraints.
- Review your design with some data.

## Example No. 1 Message Board

- A message board or discussion forum is a web-based system. Where people post their queries and get reply from other members of the discussion forum.
- A message board can belong to another message board.
- A topic must belong to a message board
- A topic can have one or many messages
- A user can send or received messages
- A user can create a topic by sending first message for that topic in any message board.
- A user can request a topic watch for any topic of its interest.

## Example No. 2 Recipe Database

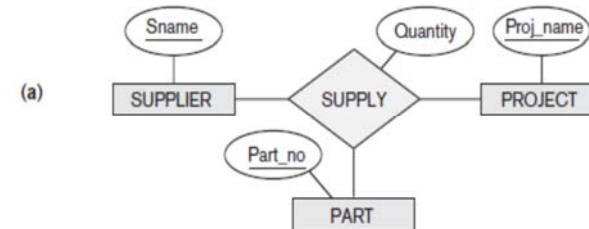
- An Internet based food recipe database is required to be developed. The recipe database will store all the information regarding the customer who supplied the recipe, the date on which the customer sent the recipe, the name of the meal, the ingredients and quantity used, etc.
- The database will also store the step by step tasks of preparation of that meal. Those tasks can be recorded as short sentences.
- Each recipe must belong to some category. Categories can have any number of levels, so that the search for any recipe can be flexible. Identify the entities and relationships and write appropriate name of each fundamental and associative entities as well as the attributes.
- Construct an ER Diagram for the above scenario also outlines the different keys/constraints.

### Example No. 3 Albano Style

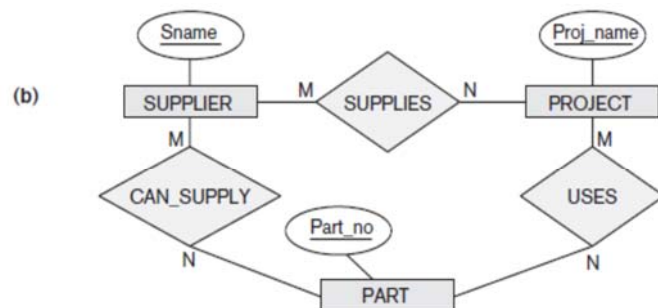
- Albino Style is a dress designer exclusively for men dressing. They have their sales outlet in different areas in the city. Each outlet has a sales person, who is responsible for selling and maintaining the outlet.
- There can be many customers for the sales-person. Each outlet is in direct connection to the customers. Hence each sales person has many customers.
- The salesman can sales different style-products to different customers.
- Draw an ER diagram for the above scenario.

## Ternary Relationship

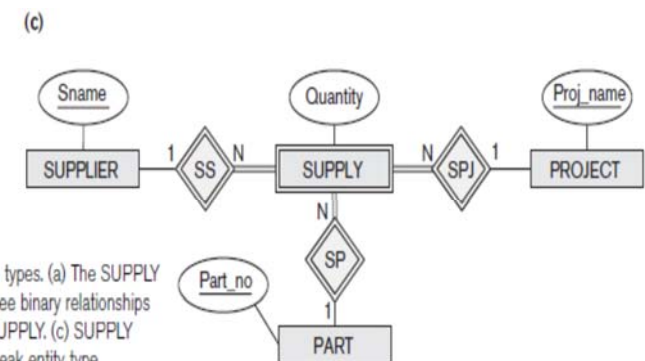
Relationships between three entities.



## Ternary Relationship



## Ternary Relationship



**Figure 7.17**  
Ternary relationship types. (a) The SUPPLY relationship. (b) Three binary relationships not equivalent to SUPPLY. (c) SUPPLY represented as a weak entity type.

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## What is a good ER design?

- There are four design guidelines for measure of quality for relational schema design.
    - Semantic of the attributes
    - Reducing redundant values in tuples
    - Reducing null values in tuples
    - Disallowing the possibilities of spurious tuples
  - The Database Design approaches
    - Design by analysis (we did this)
    - Design by synthesis (old-discarded method)
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