Validating Relationships
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Roadmap

Conceptual and Physical Data Models

Business Rules

Entities

Attributes

Unique Identifiers

Relationships

Validating Relationships

Tracking Data Changes over Time

Validating Data Using Normalization

You are here
Objectives

This lesson covers the following objectives:

• Resolve M:M relationships
• Identify hierarchical, recursive, and arc relationships
• Identify the UIDs in hierarchical, recursive, and arc relationship models
M:M Relationships

• Attributes describe only entities.
• If attributes describe a relationship, the relationship must be resolved.

ORDER
#Number
* Date
* Total

include

PRODUCT
#ID
* Name
* Description
* Price

included in

Where would you add the Quantity attribute?
Resolving M:M Relationships: Example 1

Resolve a M:M relationship with a new intersection entity and two 1:M relationships.
Case Scenario: Resolving M:M Relationships

Matt, how would you resolve the following M:M relationship between the MEMBER and the BOOK entities?

Faculty

MEMBER
#Member ID
* First Name
° Last Name
* Street Address
° City
° State
° Zip

BOOK
#Book ID
* Title
° Publr ID
* Athr ID

take

taken by
I would create an intersection entity with identifying relationships to the originating entities.
Resolving M:M Relationships: Example 2

The EMPLOYEE and JOB entities do not store the history of an employee’s jobs.
Barred Relationships

**EMPLOYEE**
- # id
- * first name
- ° last name
- ° email
- * hire date
- * salary

**JOB**
- # id
- * title
- ° minimum salary
- ° maximum salary

**JOB HISTORY**
- ° start date
- ° end date
Composite Unique Identifier

A composite UID is a UID that is a combination of attributes or relationships or both.
Modeling Hierarchical Data

Represent hierarchical data as a set of 1:M relationships.

The UIDs for a set of hierarchical entities can be propagated through multiple relationships.
Recursive Relationships

- A recursive relationship is one where an entity instance is related to another instance in the same entity.
- A recursive relationship is always modeled with a loop.
Examining Recursive Relationships

Sample Instances: fan, radiator, ignition module, carburetor, automatic choke

Sample Instances: washers, nuts, bolts, fan blade, fan belt, radiator cap, hoses, thermostat

Sample Instances: cooling system, ignition system, fuel system, engine

Sample Instances: car, truck, cab, tractor trailer rig

Diagram showing recursive relationships between Elementary Part, Subassembly, Assembly, and Product.
Generic Modeling

Another way to model a Bill of Materials recursive relationship is to create a generic `PRODUCT` entity.
Resolving an M:M Recursive Relationship

Resolve the M:M recursive relationship with an intersection entity
Arc Relationship

• An arc is an exclusive relationship group, which is defined such that only one of the relationships can exist for any instance of an entity.

• All relations included in an arc should belong to the same entity and should have the same cardinality.

• Arc relationship is represented as the arc-shaped line across two or more relationship lines.
Arc Relationships

A supertype entity and its subtypes can be modeled as an arc relationship.

Example: A PERSON entity is either an EMPLOYEE or a CUSTOMER, but not both.
Case Scenario: Arc Relationship

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Matt, can you create an entity that can have an arc relationship?

I can create a common entity called MEMBERSHIP that would hold membership details common to all membership categories.

Matt
Case Scenario: Creating a Common Entity

MEMBERSHIP

/\ held by
/  \
| holds |
|  \\ |
| / \ |
| \  |
| \ holds |
|    |
|    |

FACULTY

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STUDENT

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Summary

In this lesson, you should have learned how to:

• Resolve M:M relationships
• Identify hierarchical, recursive, and arc relationships
• Identify the UIDs in hierarchical, recursive, and arc relationship models