

Database Design

Entity Relationship Modeling and ERDs

Objectives

This lesson covers the following objectives:

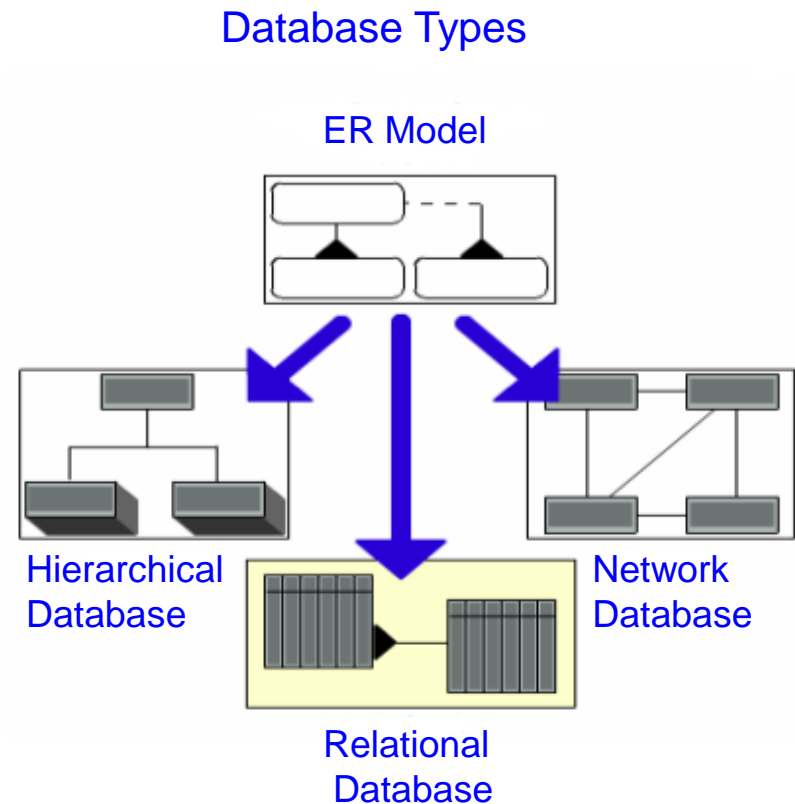
- Define the meaning of “implementation-free” as it relates to data models and database design implementation
- List the four goals of entity relationship modeling
- Identify an entity relationship diagram (ERD)

Purpose

An entity relationship diagram (ERD) is a consistent tool that can be used to represent the data requirements of a business regardless of the type of database that is used, and even in the absence of one!

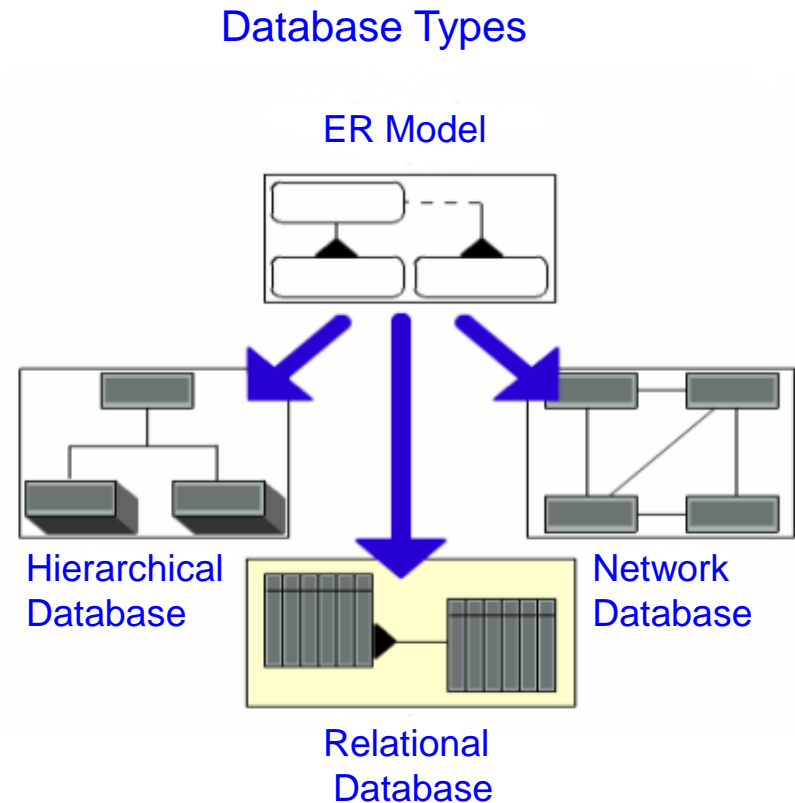
Implementation-Free Models

A good conceptual data model stays the same regardless of the type of database the system is eventually built—or implemented—on. This is what we mean when we say that the model is “implementation-free.”



Implementation-Free Models (cont.)

The data model should stay the same even if a database is not used at all. For example: when the data is eventually stored on pieces of paper in a filing cabinet.



What is an Entity Relationship Model?

An Entity Relationship Model:

- Is a list of all entities and attributes as well as all relationships between the entities that are of importance.
- Provides background information such as entity descriptions, data types, and constraints.

Note: The model does not require a diagram, but the diagram is typically a very useful tool.

Goals of ER Modeling

There are four goals of ER modeling:

- Capture all required information
- Ensure that information appears only once
- Model no information that is derivable from other information already modeled
- Locate information in a predictable, logical place

Imagine your school record—from your earliest days in school, data about you was captured. Your absences, discipline history, classes taken, and grades earned are probably part of your record.

DJs on Demand Business Scenario

Read the complete business scenario for the DJ business below. Then examine the completed ERD.

We started out as a group of friends who organized parties and customized our own music. Then we thought we'd turn it into a business to pursue our interests and earn some money. We called ourselves the "DJs on Demand."

DJs on Demand Business Scenario (cont.)

Everyone who works here is a partner. Every partner has a specific responsibility. The project manager makes the first contact with the client to discuss the event. Is it a birthday party, a wedding, an anniversary, a graduation? What is the date for the party or event?

DJs on Demand Business Scenario (cont.)

Once that is decided, the event planner gets in touch with the client about specific locations, catering, decorations, and other specific details. The DJ talks with the client about the preferred style of music. The project manager supervises the event planners and DJs. He/she also authorizes expenditures related to a project.

We have a large collection of CDs. Each CD contains several songs, and the same song can appear on several CDs. We like to classify each song by type (hip hop, salsa, R & B (rhythm and blues), techno, salsa, polka, rock, jazz, new age, classical, etc.)

DJs on Demand Business Scenario (cont.)

We can propose an initial list of songs to the client depending on the event. Of course, a client can request other songs as well.

Our client list is growing. We have a lot of repeat business -- customers who like what we've done and ask us to work their other events. We have some very busy customers who can have more than one event going on at the same time.

DJs on Demand Business Scenario (cont.)

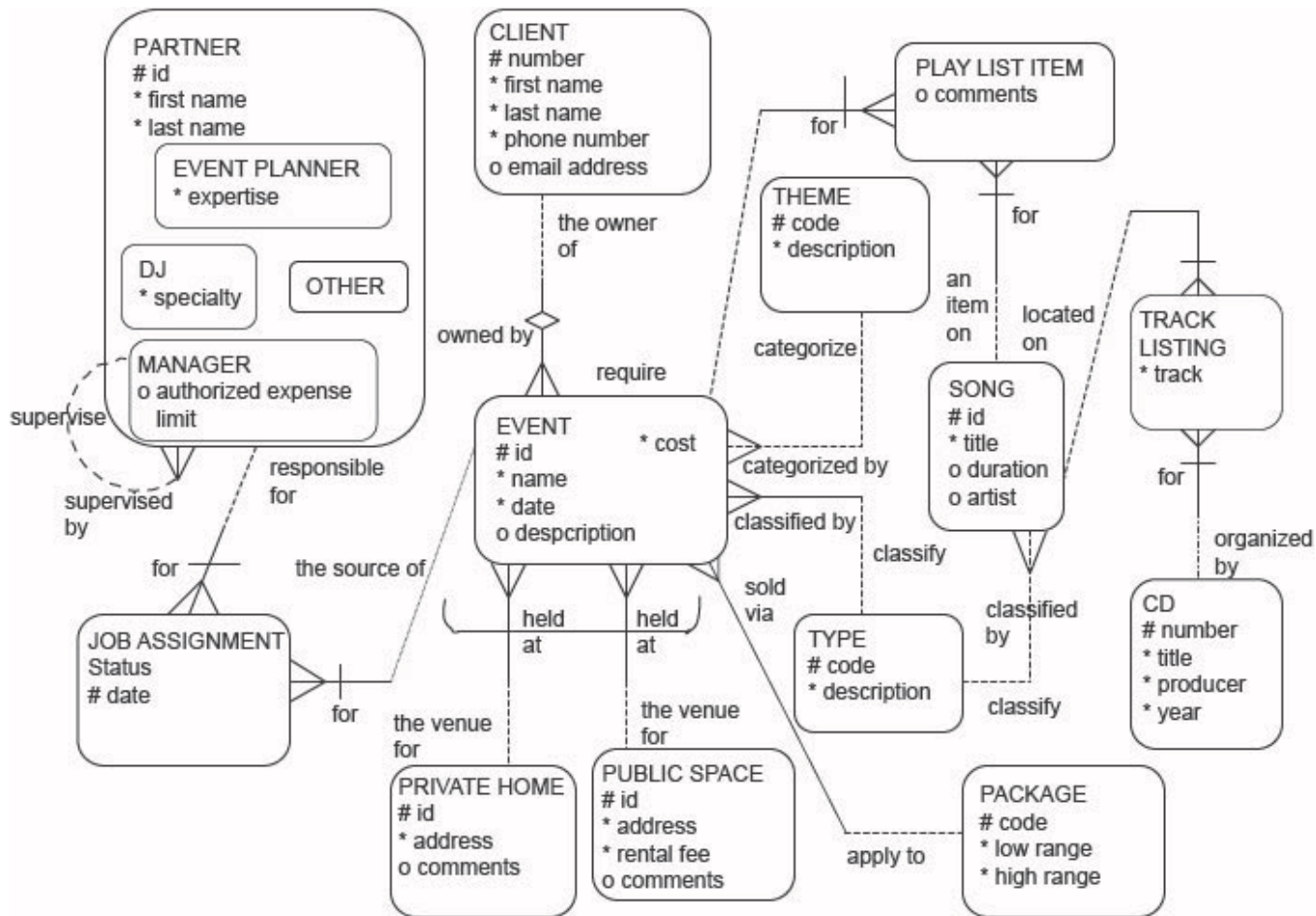
We also have a list of themes that we can use to categorize these events. For example: a wedding may have a tropical theme, a party may have a carnival theme, an anniversary could have a sixties theme, etc. This helps us pick a venue and also gives us an idea of what the DJ (and other musicians) should wear. Some partners have a specialty or expertise, so a theme also can help us assign the right person to the job.

DJs on Demand Business Scenario (cont.)

Events are held either in a public space or a private home. The event manager visits both and makes arrangements with the public-space renter or the private-home owner.

Since several partners can work on an event, and an event can be assigned to several partners, we like to keep track of who is working on which event. We keep a log of what each event planner and DJ has done on an event, and when they did it.

DJs on Demand Completed ERD



DJs on Demand

Terminology

Key terms used in this lesson included:

- Entity relationship diagram (ERD)
- Implementation-free

Summary

In this lesson, you should have learned how to:

- Define the meaning of “implementation-free” as it relates to data models and database design implementation
- List the four goals of entity relationship modeling
- Identify an entity relationship diagram (ERD)