
ORACLE
Academy

Database Design

2-1

Conceptual and Physical Models

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Objectives

This lesson covers the following objectives:

- Explain the importance of clearly communicating and accurately capturing information requirements
- Distinguish between a conceptual model and its physical implementation
- List five reasons for building a conceptual data model
- Give examples of conceptual models and physical models

Purpose

- When you are able to recognize and analyze information, you can better understand how things work and potentially make them better
- For example:
  - How to make the line at the food counter go faster
  - How to successfully exchange an item at the store
  - How to organize and keep track of your growing CD collection
- Also, recognizing and analyzing information helps prevent mistakes and misunderstanding
- For a business, this is important because it saves time and money

What is a Conceptual Model?

A conceptual model:

- Captures the functional and informational needs of a business
- Is based on current needs but it may reflect future needs
- Addresses the needs of a business (what is conceptually ideal), but does not address its implementation (what is physically possible)
- Is the result of completing the Data Modeling process

What is a Conceptual Model?

- A conceptual model:
  - Identifies :
    - important entities (objects that become tables in database)
    - relationships among entities
  - Does not specify :
    - attributes (objects that become columns or fields in database)
    - unique identifiers (attribute that becomes primary key in database)

What is a Conceptual Model?

- A conceptual model is important to a business because it:
  - Describes exactly the information needs of the business
  - Facilitates discussion
  - Prevents mistakes and misunderstandings
  - Forms important “ideal system” documentation
  - Forms a sound basis for physical database design
  - Documents the processes (also known as the “business rules”) of the business
  - Takes into account regulations and laws governing this industry

What is a Logical Model?

- A logical model:
  - Includes all entities and relationships among them
  - Is called an entity relationship model (ERM)
  - Is illustrated in an ERD
  - Specifies all attributes and UIDs for each entity
  - Determines attribute optionality
  - Determines relationship optionality and cardinality

What Is a Physical Model?

- A physical model:
  - Is an extension to a logical data model
    - Defines table definitions, data types, and precision
    - Identifies views, indexes, and other database objects
  - Describes how the objects should be implemented in specific database
  - Shows all table structures, including columns, primary keys, and foreign keys

Conceptual and Physical Models

- It is the art of planning, developing, and communicating that allows a group of people to work together to achieve a desired outcome
- Data modeling is the process of capturing the important concepts and rules that shape a business and depicting them visually on a diagram
- This diagram becomes the blueprint for designing the physical thing
- The client's dream (conceptual model) will become a physical reality (physical model)

Terminology

- Key terms used in this lesson included:
  - Conceptual model
  - Data
  - Data modeling
  - Physical model

Summary

- In this lesson, you should have learned how to:
  - Explain the importance of clearly communicating and accurately capturing information requirements
  - Distinguish between a conceptual model and its physical implementation
  - List five reasons for building a conceptual data model
  - Give examples of conceptual models and physical models


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