

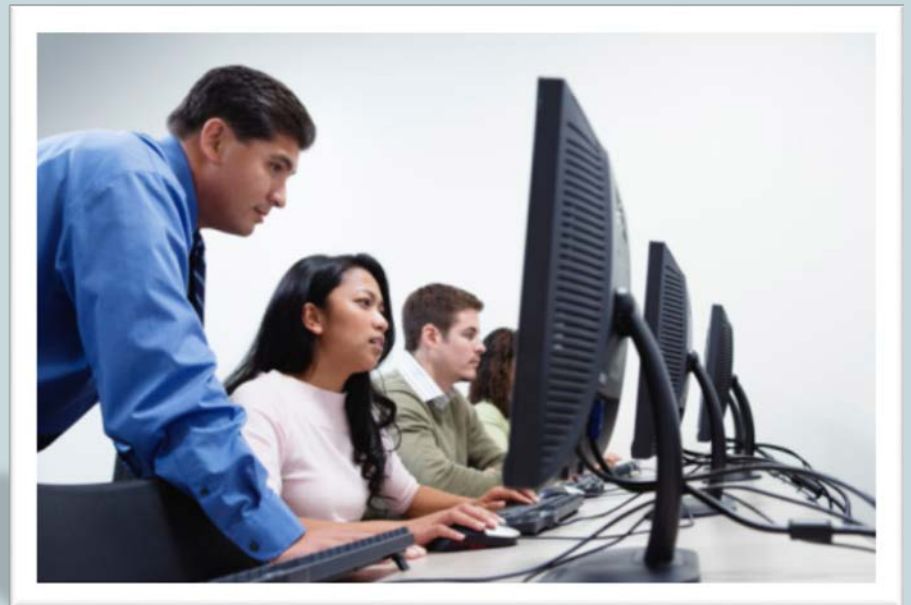




Database Design

2-1

Conceptual and Physical Models



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 UUIDs 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

