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# Database Design

2-3

Entity Relationship Modeling and ERDs

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# 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)

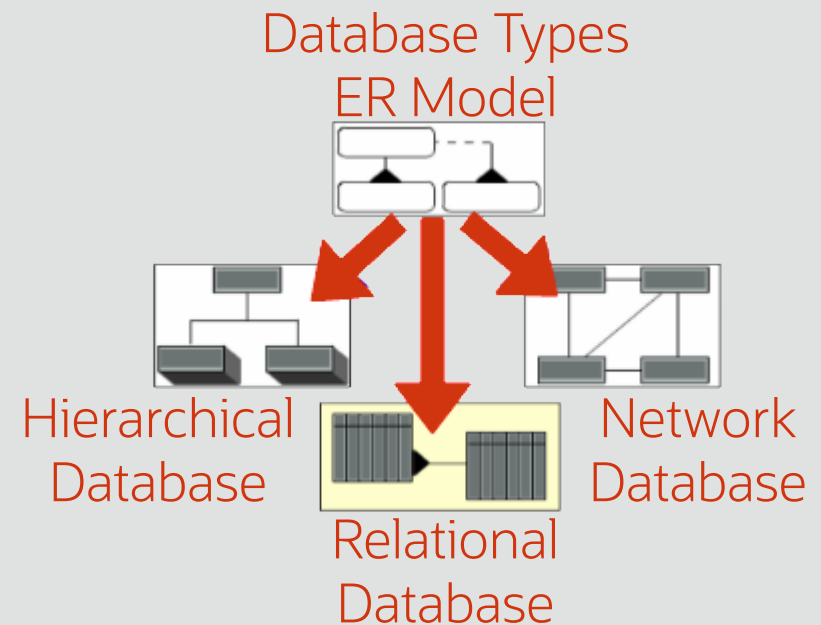


# Purpose

- 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!

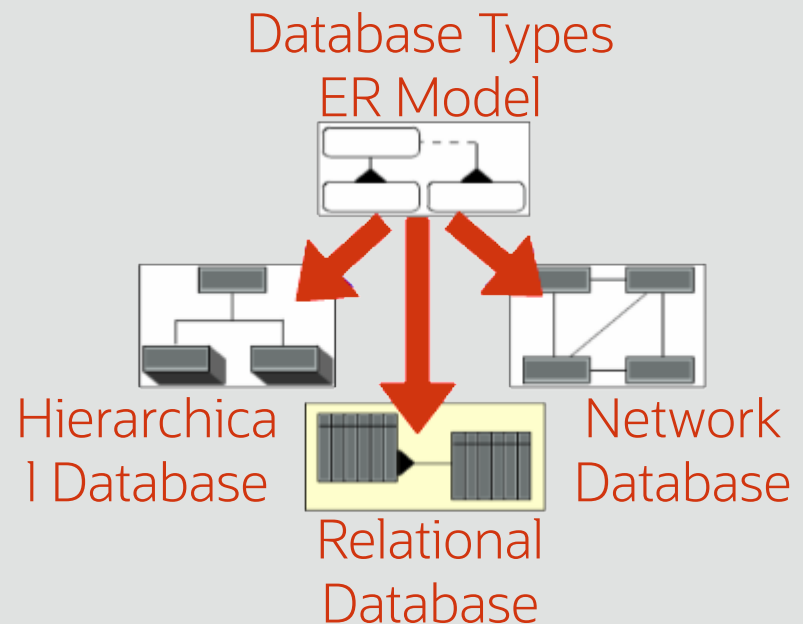
# Implementation-Free Models

- 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

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



# Goals of ER Modeling

- 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
- This data needs to be stored in a logical way, to allow accessing and updating records to be carried out easily and efficiently
- Following the goals of ER Modeling helps to achieve this

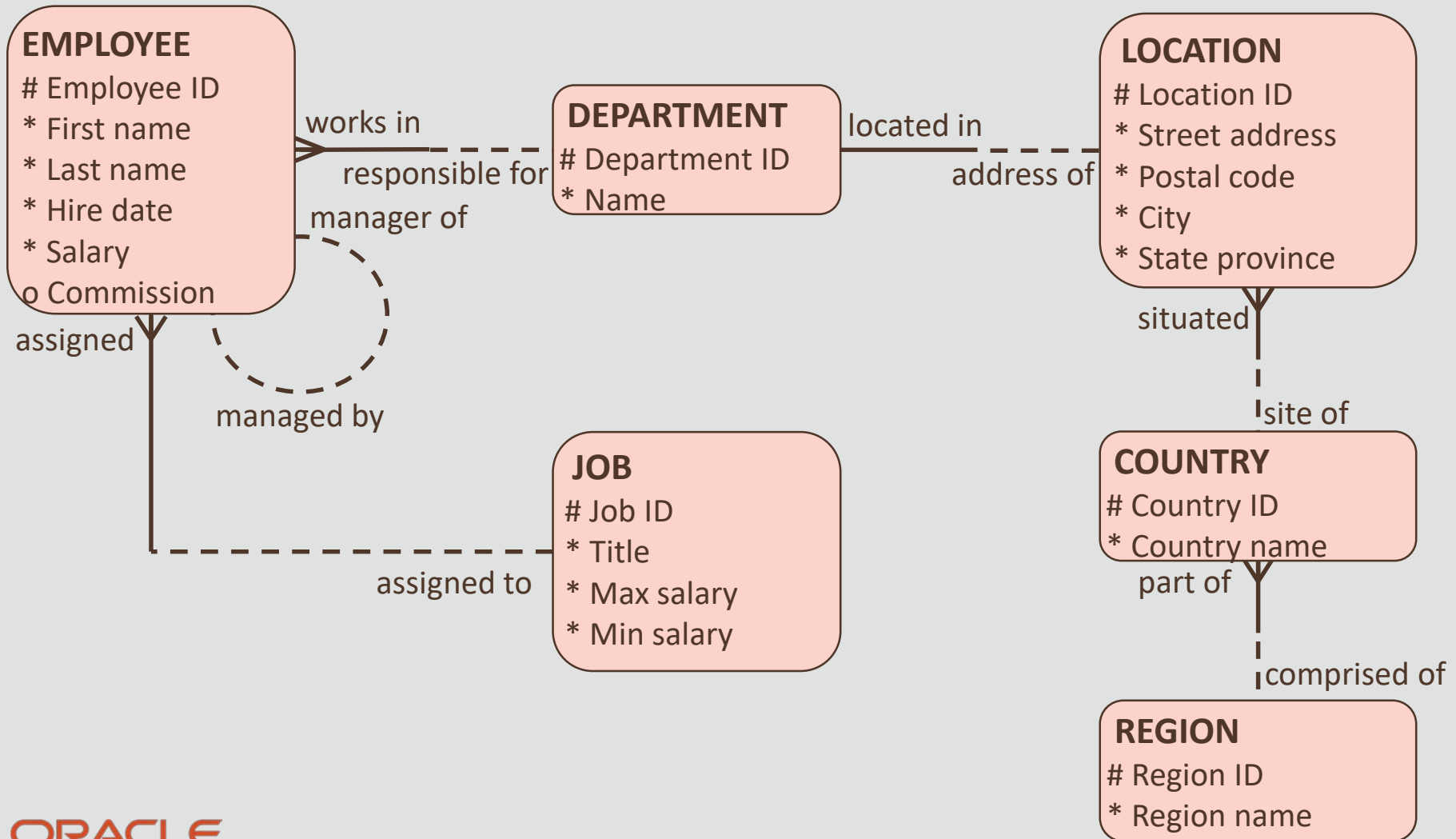
# H.R. Department Business Scenario

- Read the complete business scenario for the Human Resource Department below
- Then examine the completed ERD
  - I manage the Human Resources Department for a large company
  - We need to store data about each of our company's employees
  - We need to track each employee's first name, last name, job or position, hire date and salary
  - For each employee on commission, we also need to track his/her potential commission
  - Each employee is assigned a unique employee number

# H.R. Department Business Scenario

- Read the complete business scenario for the Human Resource Department below
- Then examine the completed ERD
  - Our company is divided into departments
  - Each employee reports to a department -- for example, accounting, sales, or development
  - We need to know the department responsible for each employee and the department location
  - Each department has a unique number.
  - Some of the employees are managers
  - We need to know each employee's manager and all of the employees that are managed by each manager

# H.R Department ERD



# 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)

## Quiz

Click the **Quiz** button to edit this object

An Entity Relationship model is independent of the hardware or software used for implementation. True or False?

☐ True

☐ False

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