Systems Analysis and design - 2

Slide Adapted from:

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(Modern Systems Analysis and Design, 7th Edition, **Pearson Prentice Hall)**

Chapter 8

Structuring System Data Requirements

Learning Objectives

- ✓ Concisely define each of the following key data modeling terms: entity type, attribute, multivalued attribute, relationship, degree, cardinality, business rule, associative entity, trigger, supertype, subtype.
- ✓ Draw an entity-relationship (E-R) diagram to represent common business situations.
- ✓ Explain the role of conceptual data modeling in the overall analysis and design of an information system.

Learning Objectives (Cont.)

- ✓ Explain the role of prepackaged database models (patterns) in data modeling.
- ✓ Distinguish between unary, binary, and ternary relationships and give an example of each.
- ✓ Define four basic types of business rules in a conceptual data model.
- ✓ Relate data modeling to process and logic modeling as different views of describing an information system.

Conceptual Data Modeling

- **Conceptual data modeling**: a detailed model that captures the overall structure of data in an organization
  - Independent of any database management system (DBMS) or other implementation considerations

Conceptual Data Modeling (Cont.)

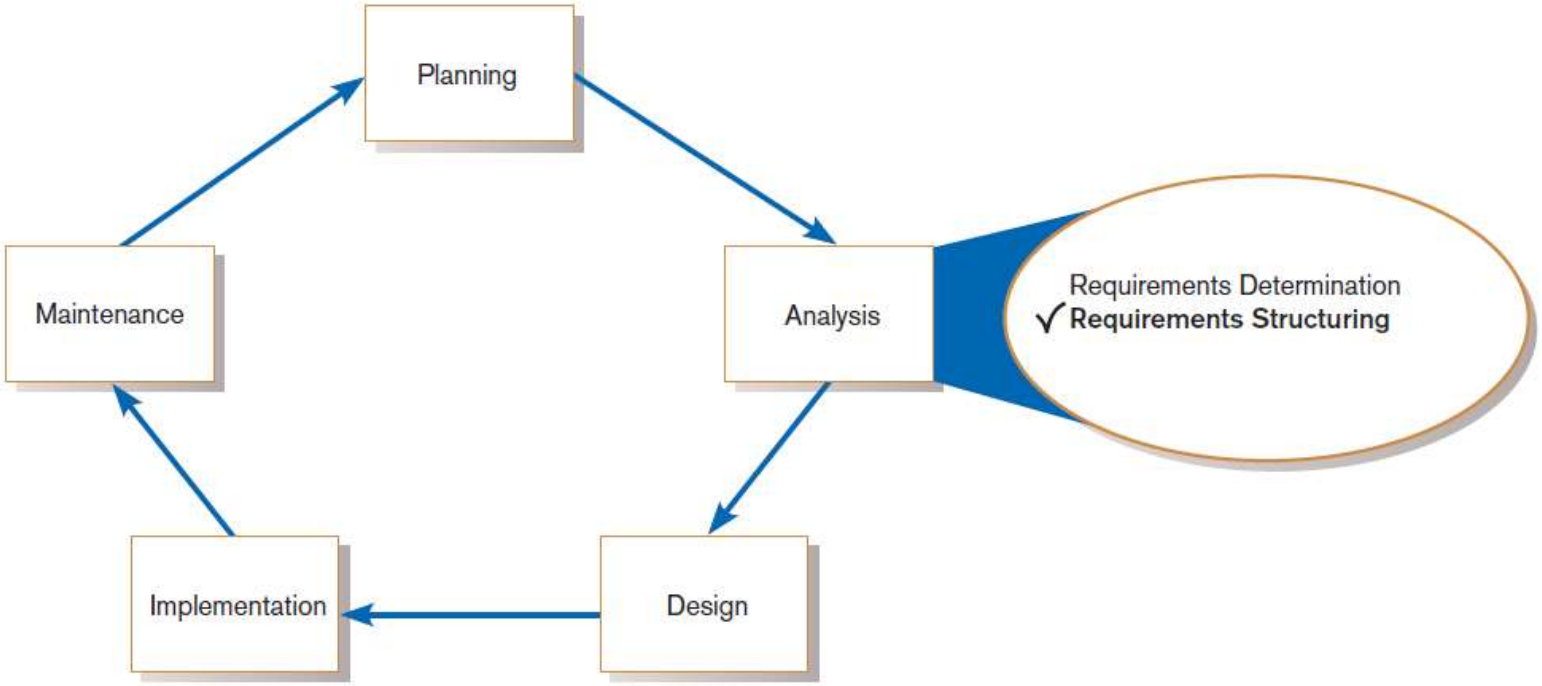


FIGURE 8-1
Systems development life cycle with analysis phase highlighted

The Conceptual Data Modeling Process

- Develop a data model for the current system.
- Develop a new conceptual data model that includes all requirements of the new system.
- In the design stage, the conceptual data model is translated into a physical design.
- Project repository links all design and data modeling steps performed during SDLC.

Conceptual Data Modeling (Cont.)

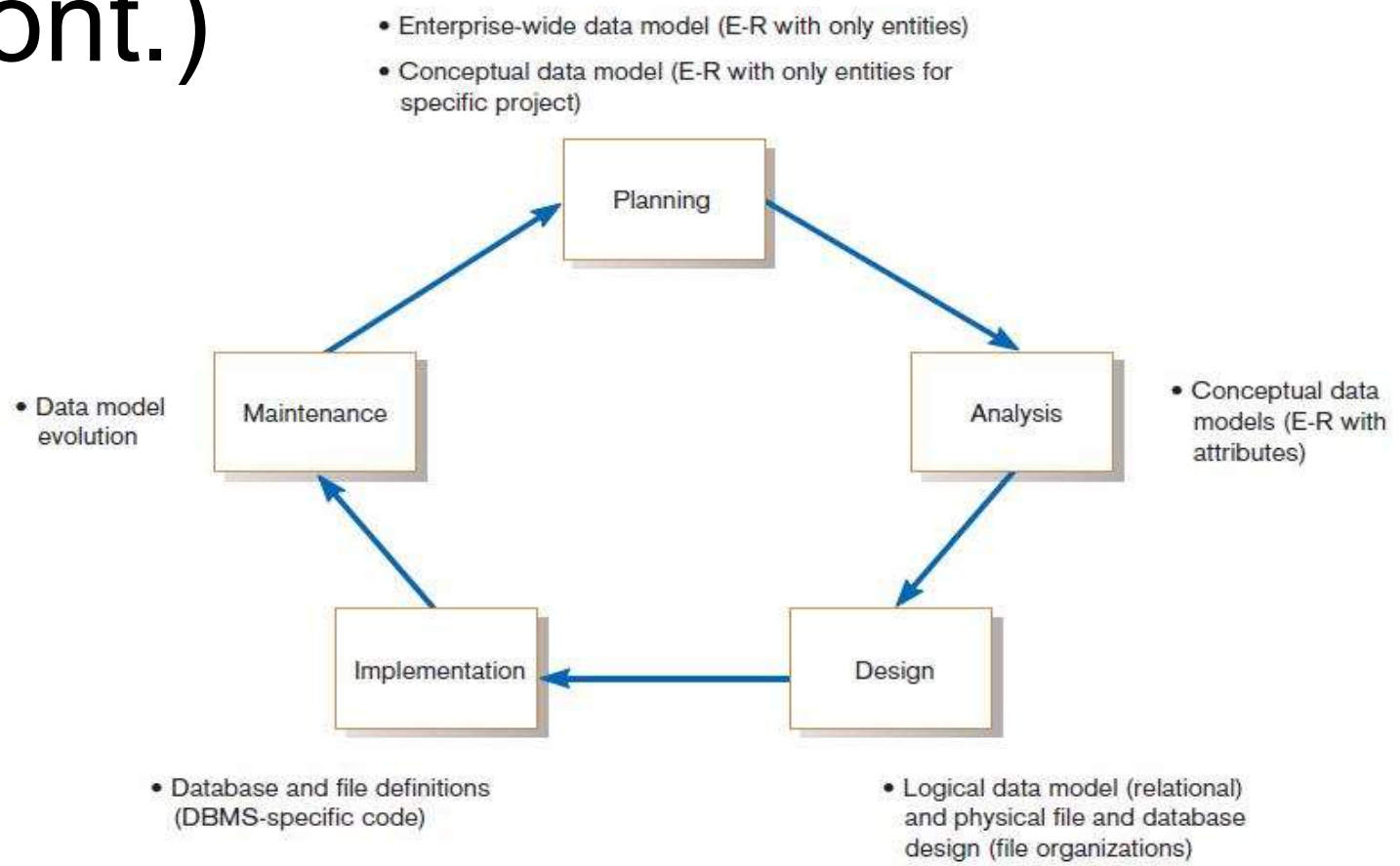


FIGURE 8-2
Relationship between data modeling and the SDLC

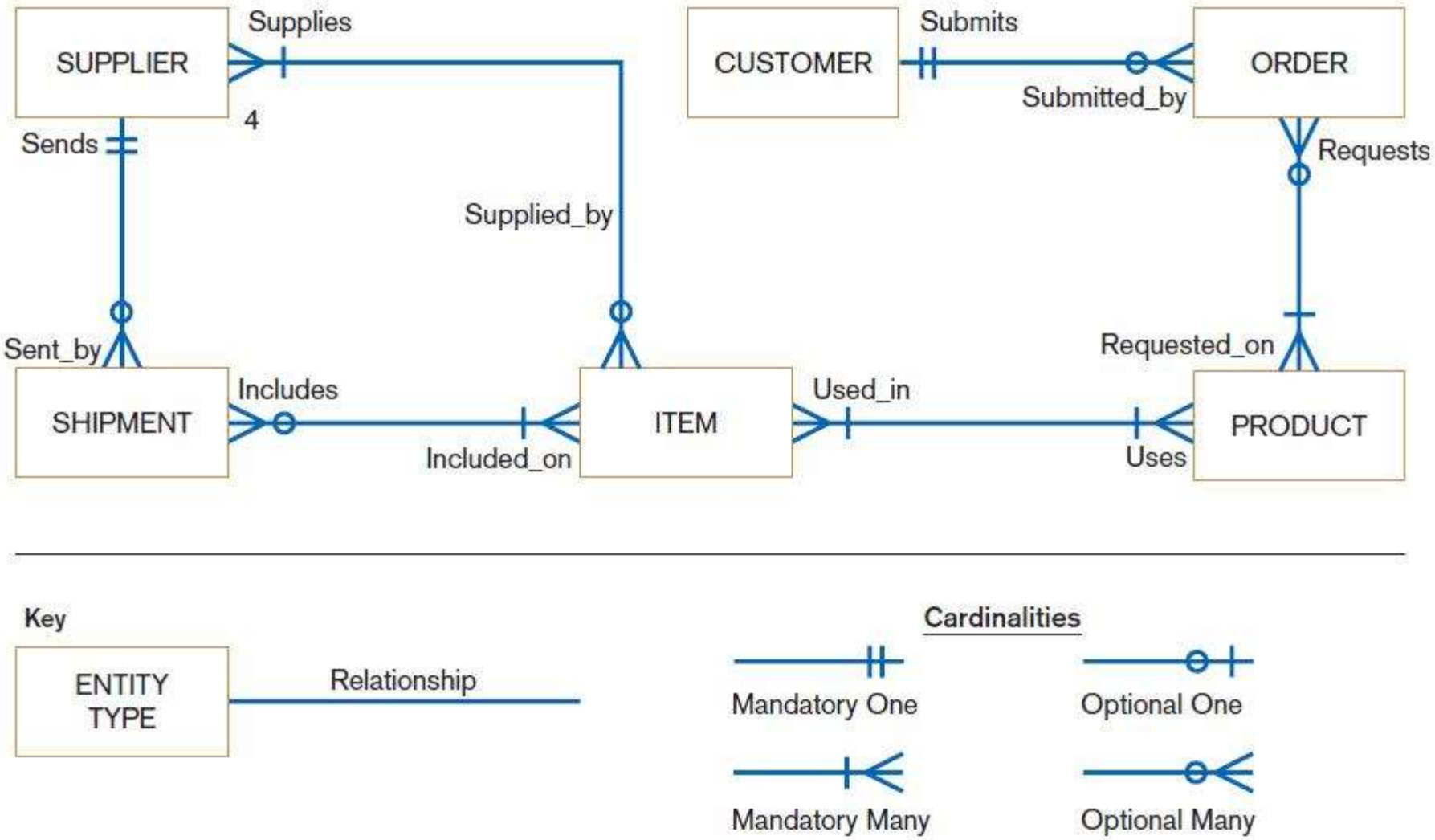


FIGURE 8-3
Sample conceptual data model

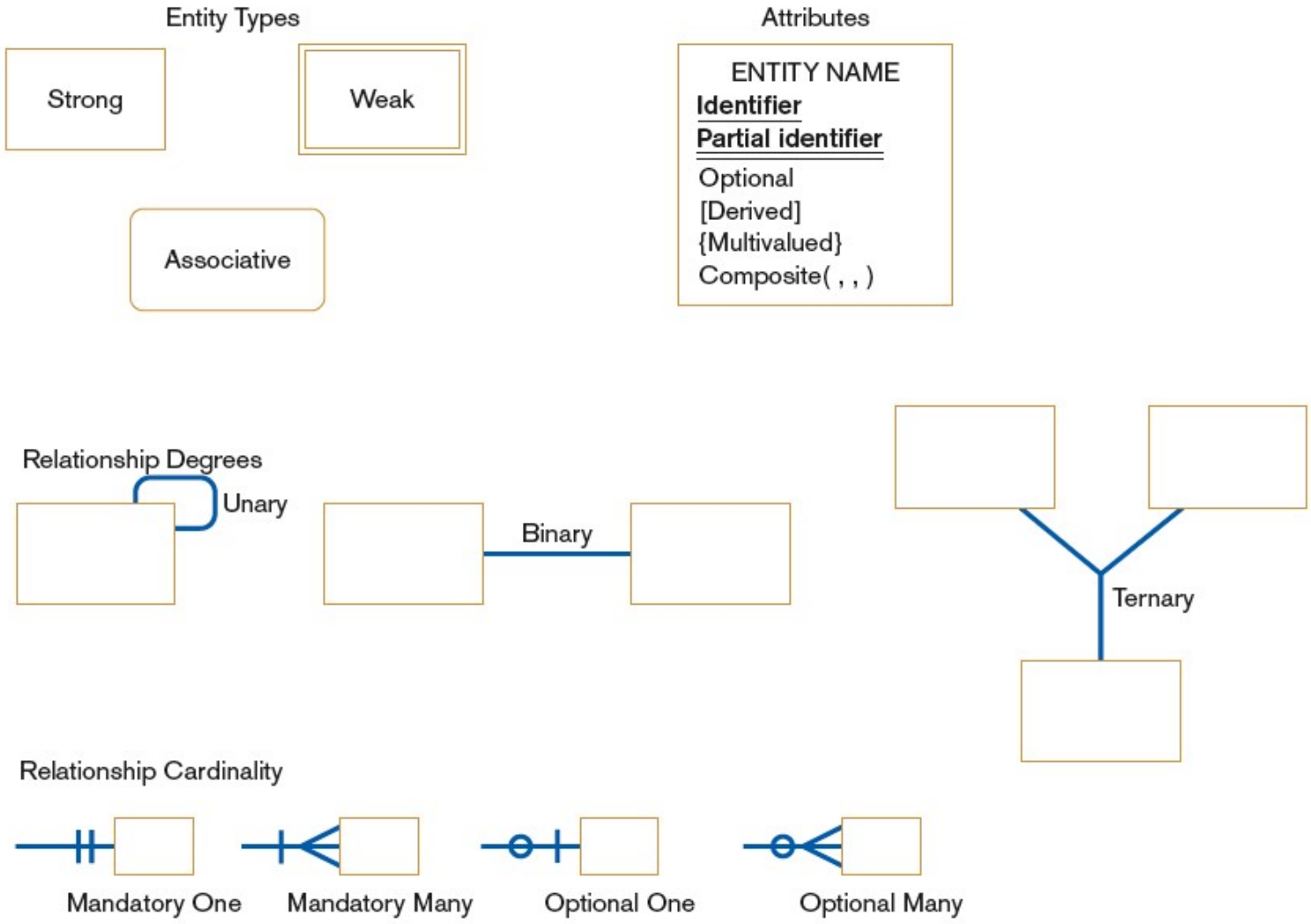
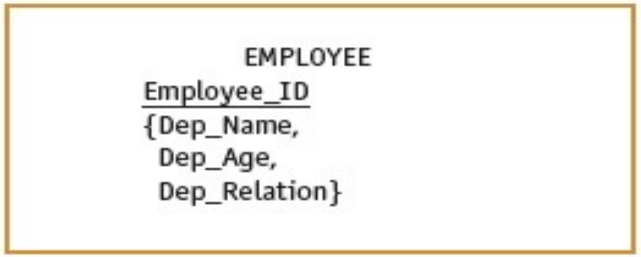
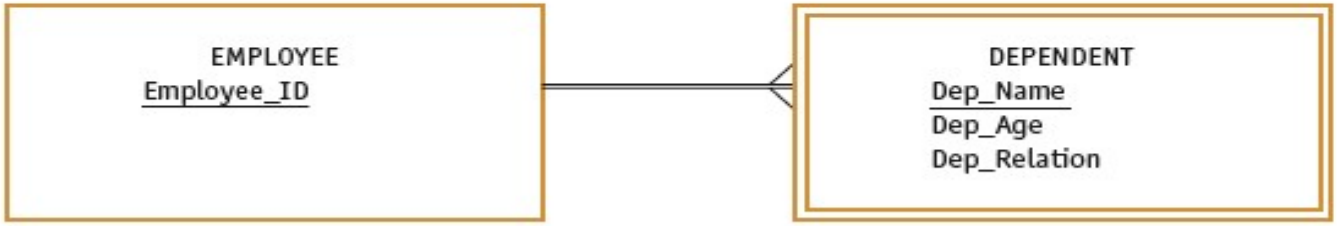


FIGURE 8-5 Basic E-R notation

(a) Multivalued attribute skill



(b) Repeating group of dependent data



(c) Weak entity for dependent data

FIGURE 8-8
Multivalued attributes and repeating groups

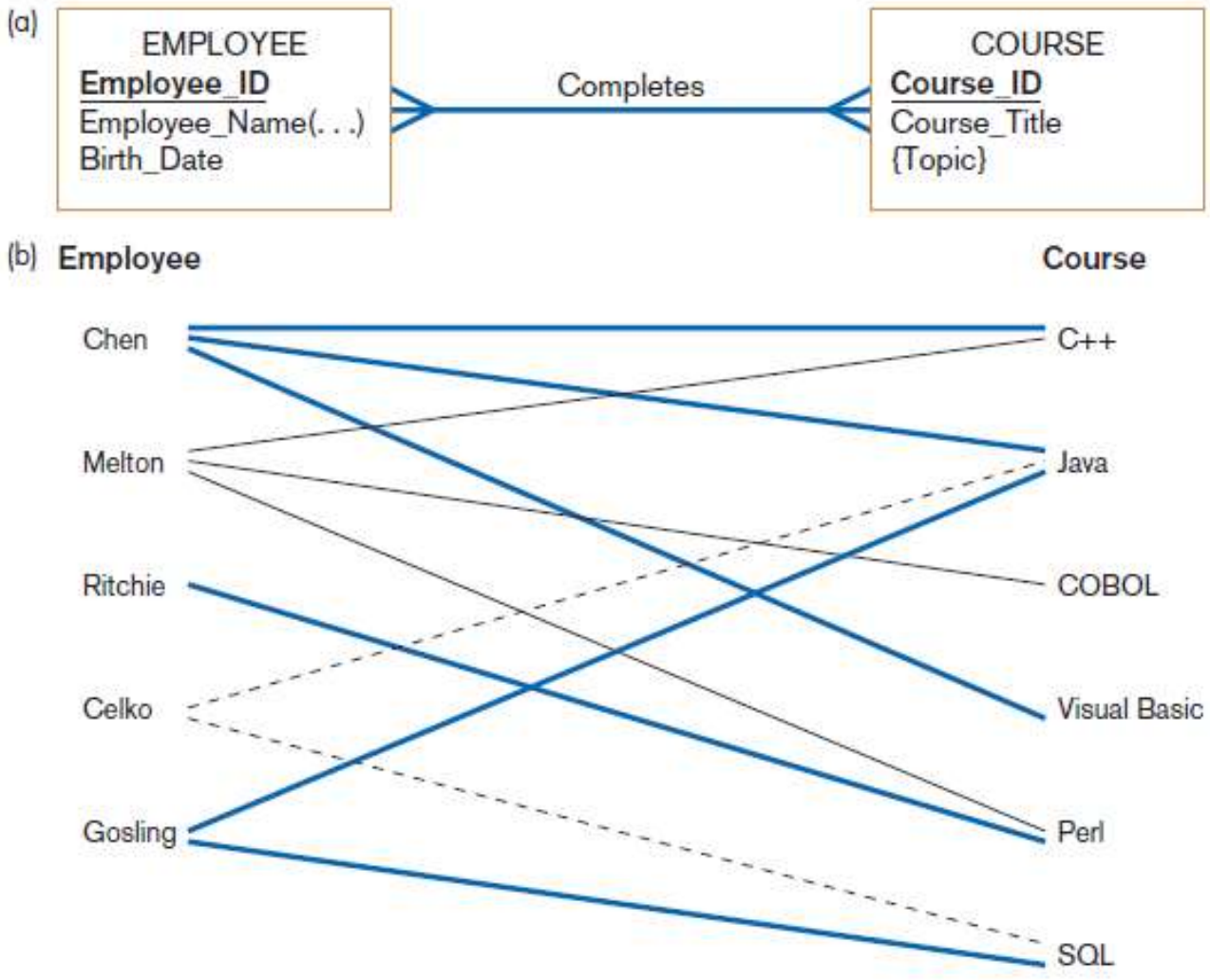


Figure 8-10
Relationship type and instances
(a) Relationship type (Completes)
(b) Relationship instances

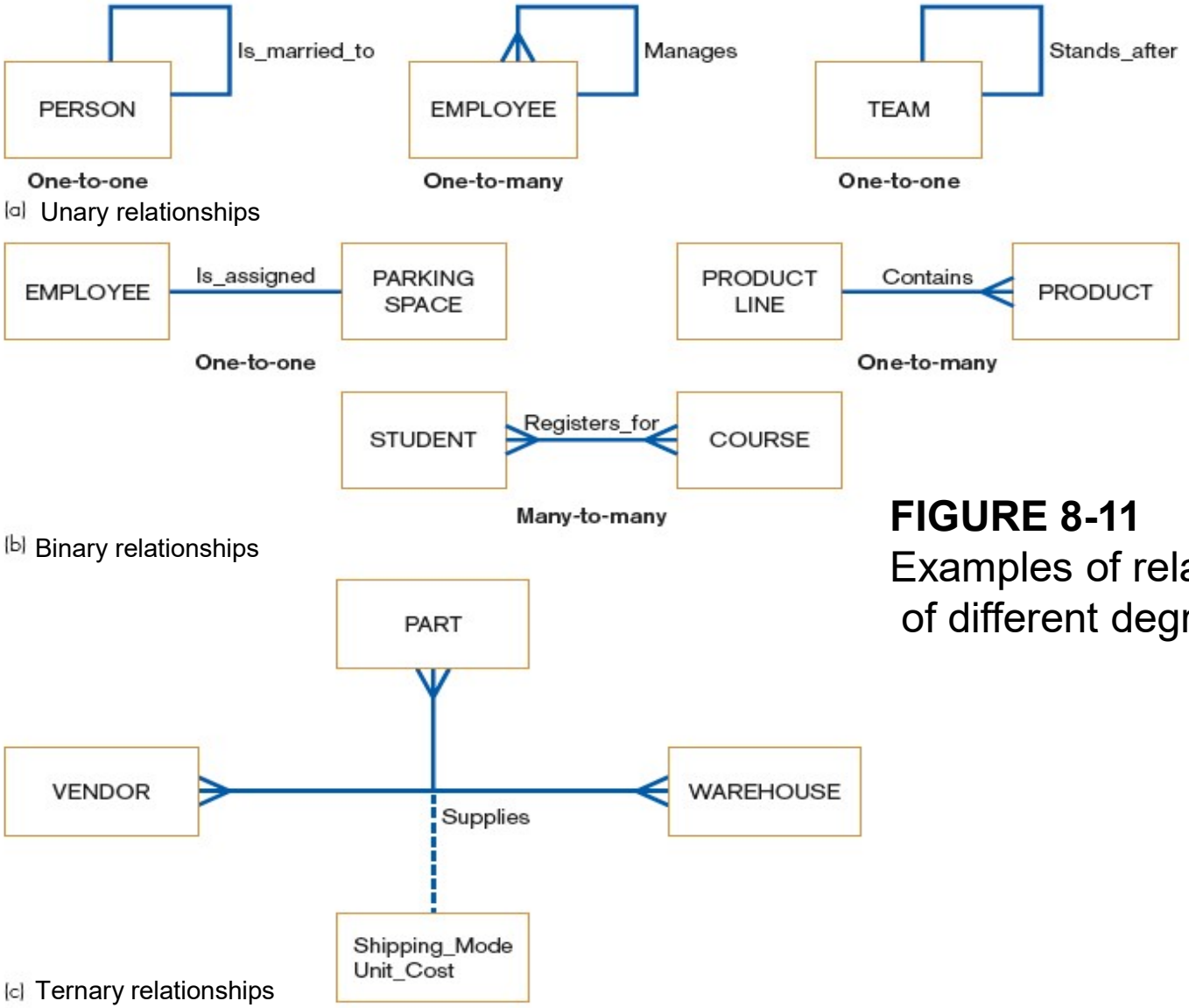


FIGURE 8-11
Examples of relationships of different degrees

Summary (Cont.)

- In this chapter you learned how to:
  - ✓ Explain the role of prepackaged database models (patterns) in data modeling.
  - ✓ Distinguish between unary, binary, and ternary relationships and give an example of each.
  - ✓ Define four basic types of business rules in a conceptual data model.
  - ✓ Relate data modeling to process and logic modeling as different views of describing an information system.