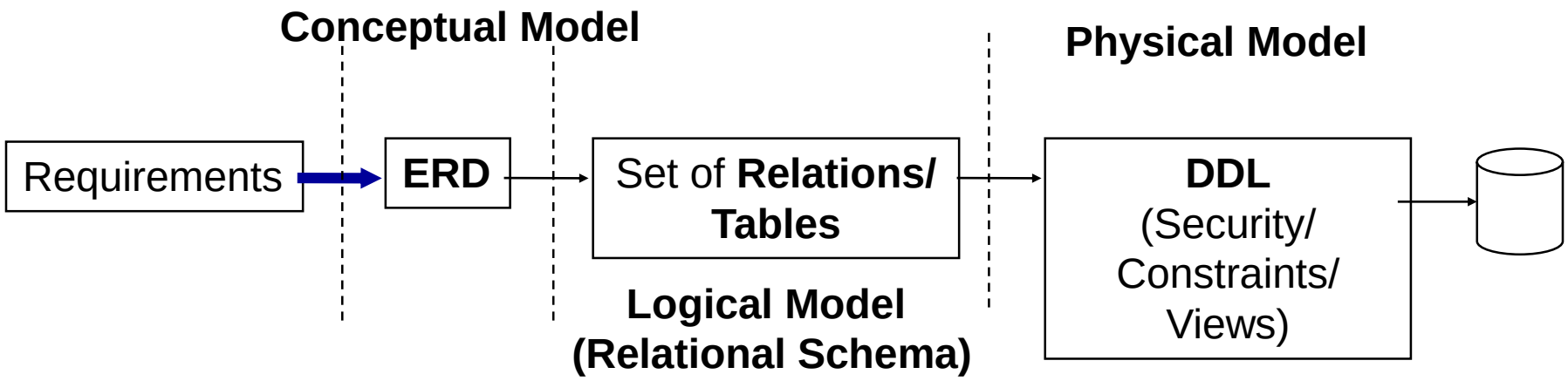
Session 2-1 Entity

Kyunghee Lee, PhD

WAYNE STATE
Mike Ilitch School of Business

Three Schemas and Conceptual Data Modeling



Conceptual Data Model

- captures the overall structure of organizational data in detail
- independent of any database management system or other implementation considerations
- accurately describes the content and structure of data in the client/user's world

Entity-Relationship Diagram (ERD)

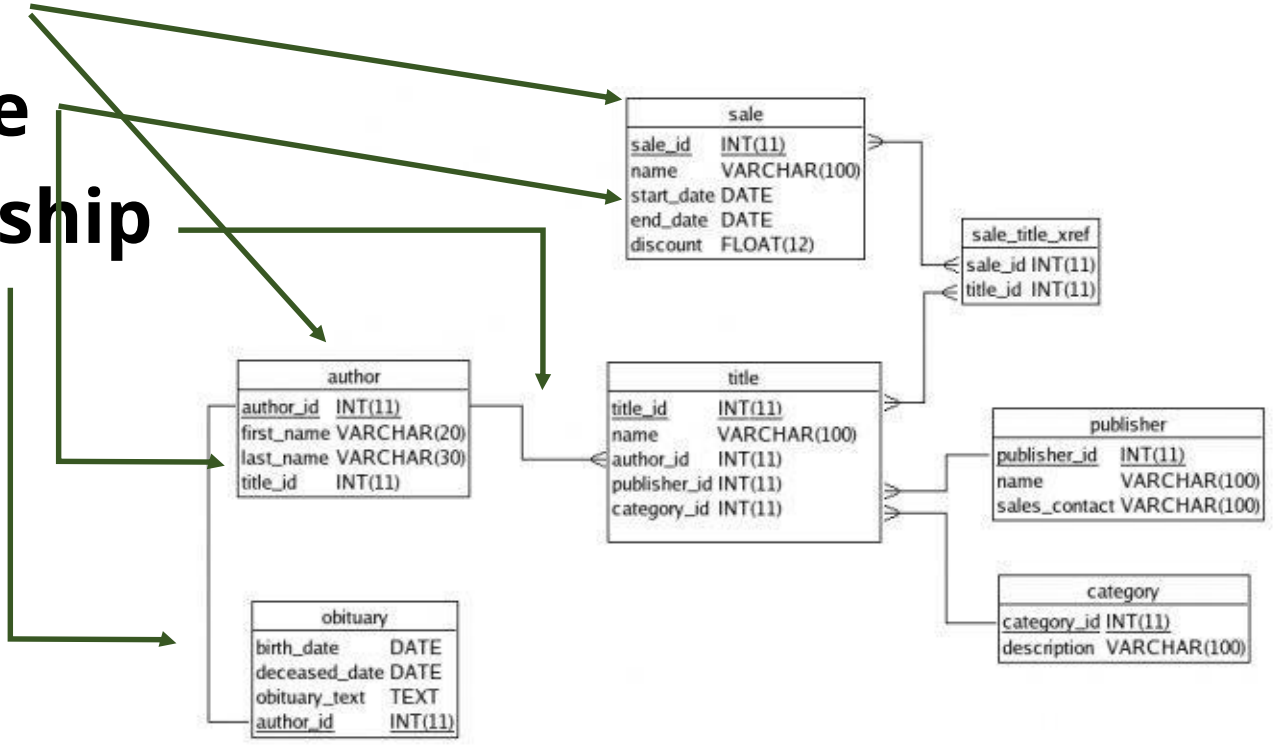
- (conceptual) data modeling tool
- depicts the associations among different categories of data in a business
- **NOT** imply how data is implemented, created, modified, used, or deleted

Three Components of ERD

Entity

Attribute

Relationship



Entity / Entity Type

- A person, place, object, event, or concept about which you want to gather and store data
- Collection of entities that share common properties or characteristics
- E.g., STUDENT, EMPLOYEE, CAR

Entity Type: STUDENT

Student ID	Last Name	First Name
2144	Arnold	Betty
3122	Taylor	John
3843	Simmons	Lisa
9844	Macy	Bill
2837	Leath	Heather
2293	Wrench	Tim

Entity Instance

- Single occurrence of an entity type
  - e.g., Jane Smith, 642-17-8360, Toyota Camry

Entity Type: STUDENT

Entity Instances

Student ID	Last Name	First Name
2144	Arnold	Betty
3122	Taylor	John
3843	Simmons	Lisa
9844	Macy	Bill
2837	Leath	Heather
2293	Wrench	Tim

What Should an Entity Be?

- An Entity SHOULD BE:
  - An object that will have many instances in the database
  - An object that will be composed of multiple attributes
  - An object that we are trying to model
- An Entity SHOULD NOT BE:
  - A user of the database system
  - An output of the database system (e.g., a report)

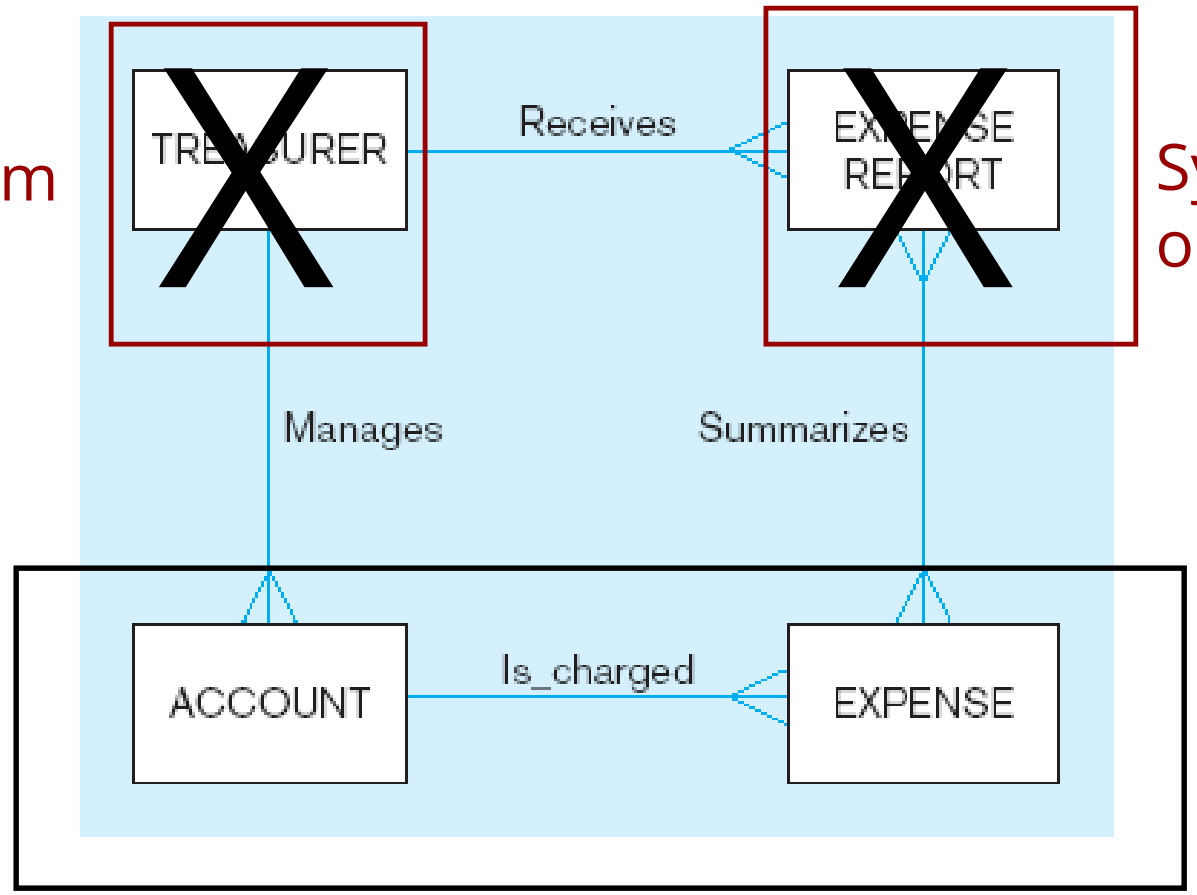
Example: Expense Management

- The treasurer manages all the accounts in the company.
- S/he needs to enter data about the various accounts in the company – say account id, responsible person, description, budget, balance, etc.,
- Each account can have various expense transactions that need to be recorded (date, time, amount, reason, etc.)
- Treasurer receives expense report at regular intervals. The expense report presents and summarizes data from the expense transactions and may also contains account information.

What are the entities that you would have in your ERD?

Example of Inappropriate Entities

System user



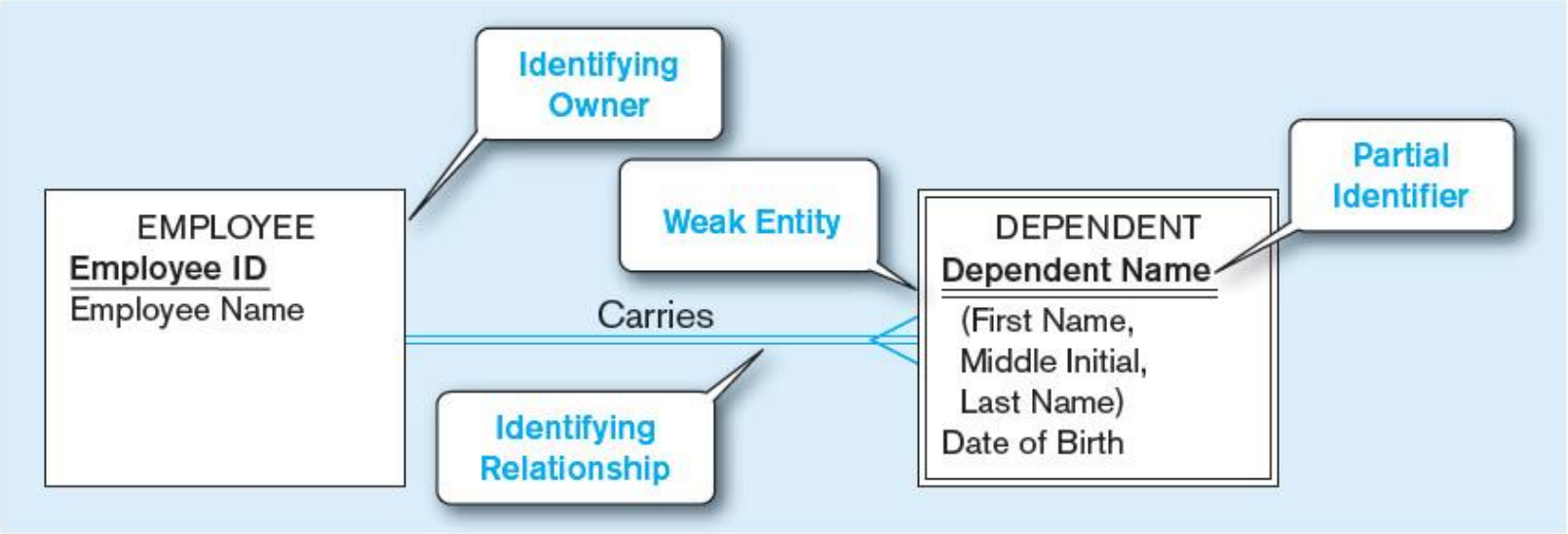
System output

Appropriate Entities

Entity Type: Strong Vs. Weak

- Strong Entity Type
  - exists independently of other types of entities
  - has its own unique identifier
- Weak Entity Type
  - dependent on a strong entity (identifying owner)…cannot exist on its own
  - does not have a unique identifier (only a partial identifier)
  - entity box and partial identifier have double lines

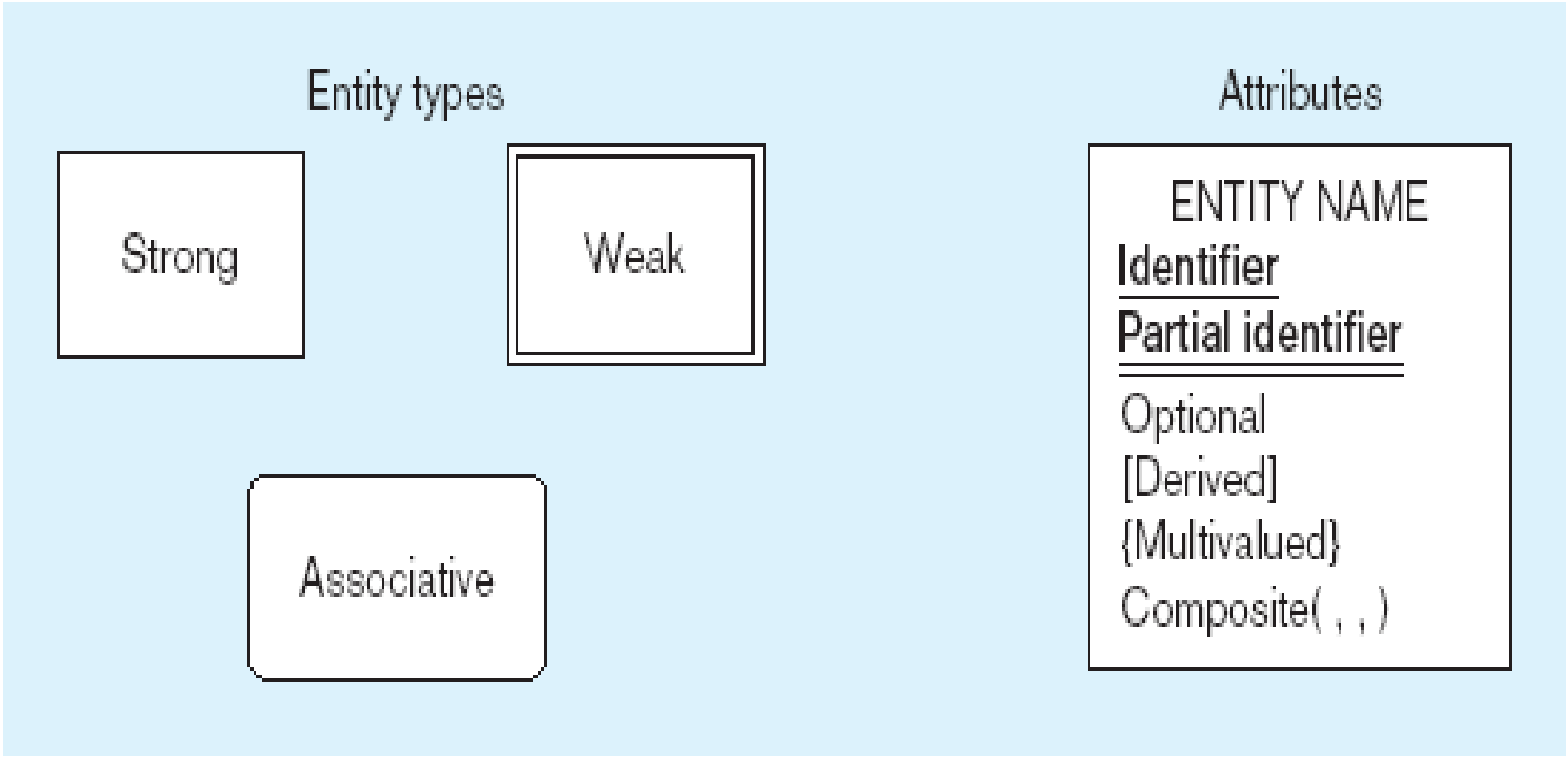
Entity Type: Strong Vs. Weak



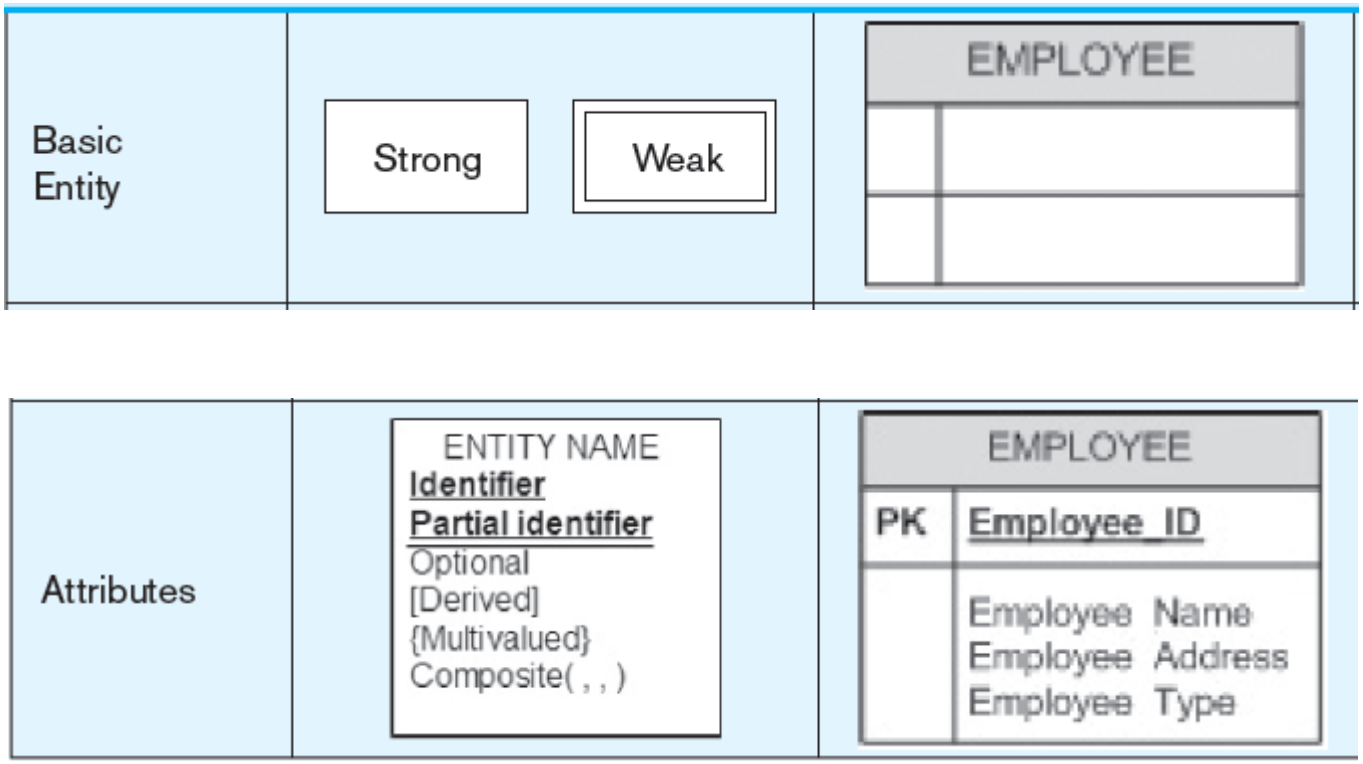
Guidelines for Naming Entities

- Singular noun
- Capital letter
- Unique
- Specific to organization
- Concise, or abbreviation
- Name consistent for all diagrams

ERD Notation (I)



ERD Notation (II)



Wrap-up

- Entity/entity type/entity instance
- Strong and weak entity types
- ERD notation