

Data Design

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Web Development with PHP

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Outline

- 1 Data Modeling
- 2 Three Models
 - Conceptual Model
 - Logical Model
 - Physical Model

Data Modeling Process

- The Data Modeling Process is used to define and analyze data requirements needed to support the understanding of the data within a problem domain or business context.
- The process of data modeling involves data modelers or business analysts working closely with business stakeholders, as well as potential users of the system.
- Many believe that data modeling is the process of learning about the data, and the data model is the end result of the data modeling process.
- A well engineered information system will typically use three different types of data models while progressing from requirements to the actual database to be used for the information system.
- The data requirements are initially recorded as a conceptual data model which is essentially a set of coarse grained data definitions and is used to discuss initial requirements with the business stakeholders.

Example: Data Modeling Twitter

Definition

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Important Data Models: What is required for a tweet to be stored within our systems?

- **Profile:** Essential data about the user
- **Tweet:** All the tweet messages ever posted on our site
- **Others:** Inevitably, more data requirements will arise as the model grows

Notice how the complexity of the data model will grow organically over time as the data model is mapped by the developers and stakeholders.

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Example relationships:

- One **user** can **tweet** many times.
- Many **users** can like many **tweets**.
- Many **tweets** can be **retweeted** many times by many **users**.

Enumerating all such relationships completes the conceptual model. The conceptual model is the first step in organizing the data that will drive the web site.

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Logical models can be thought of as a transitional step from the conceptual model to the physical model. The logical model incorporates all the concepts mapped out in the conceptual model and integrate it into a model that can be directly deployed in any database system. A logical model usually takes the form of Unified Modeling Language (UML) and/or an Entity Relationship Diagram (ERD). An example ERD is depicted in Figure 2.

Entity Relationship Diagram Symbols

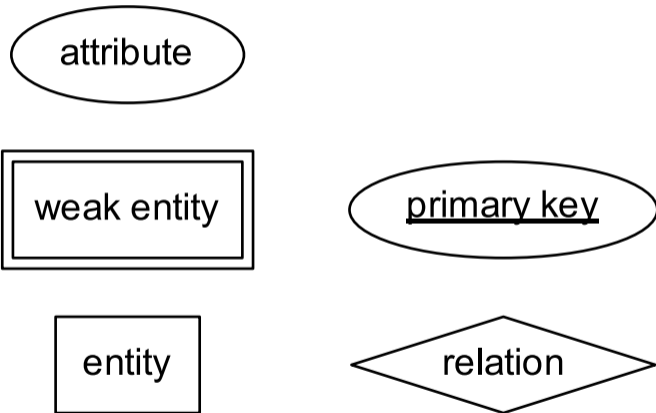


Figure 1: Entity Relationship Diagram Symbols

Example Entity Relationship Diagram

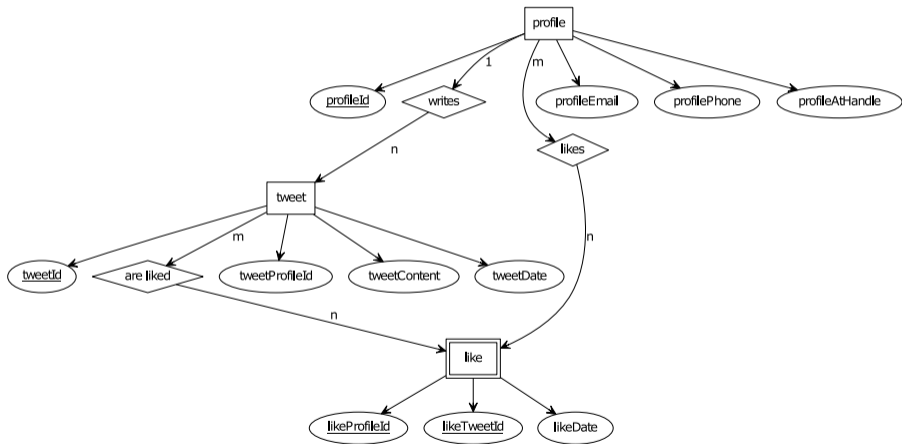


Figure 2: Entity Relationship Diagram for Twitter

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In MySQL, the physical model will be a *.sql file containing one or more CREATE TABLE statements. The CREATE TABLE statement creates a concrete storage area for data in a MySQL database and describes exactly how the data will be stored and managed.