BUS 362

Assignment 06 - Entity Relationship Diagrams

Ashton Charbonneau

2015-06-23

Entity Relationship Diagrams

Purpose

- Visual representation of a database
- How data is stored
- Relationships between data
- Unrelated to processes or how data is used, therefore unrelated to DFD and use cases

Components

- Entities
- Attributes
- Relationships
    - Modality
    - Cardinality

Entities

- Think of each entity as a spreadsheet containing data
- Describes what an instance of that entity will look like
- Most businesses have multiple spreadsheets to track different things about their business

Examples

- Universities track students, classes, professors
- Car dealerships track customers, dealers, vehicle models, instances of vehicles
- Libraries track customers, librarians, books, instances of books
- Facebook tracks users, friendships, albums, events, games (all of which have their own databases), groups, wall posts, comments, statuses, etc

Attributes

- Each column in a spreadsheet
- Information about each entity that you want to store
- Not all entities have to have each attribute
- Each entity will have a primary key (unique and non-null)

Foreign Keys

- If it is on the many side of a 1:M relationship, you need to track which other entity it is related to
- List the primary key of another entity in your attributes

Relationships

- Labeled as a verb in each direction
- 1:1, 1:M, M:N
- *Entity1* has/is of *Entity2*
- *Student* takes/participates in *Class*
- Can be between any two entities

Higher Level Courses

- Can be between itself (recursive relationships, eg. hierarchical relationships)
- Entities can have multiple relationships (eg. department and boss, team and team captain)

Modality and Cardinality

Modality

- 1 or 0
- Describes whether or not the relationship is optional
- Some students are not associated with any classes, some classes are not associated with any students
- All students have a library account, all library accounts have a student

Cardinality

- 1 or many
- Whether it is associated with only one entity at a time, or multiple
- Each student can take many classes at a time
- Each student can only have one library card at a time

Resolving M:N Relationshpis

- Create an intermediate entity
- Not always obvious
- *Student* >-< *Class*
- *Student* -< *Class Enrollment* >- *Class*

Textbook Pages

- 5th Edition: Chapter 6 - Data Modeling (p224 - 254)
- 6th Edition: Chapter 6 - Data Modeling (p187 - 216)

Example

Example

- Student information system
- Students, professors, classes

Assignment

Instructions

- Using VISIO, draw the ERD. You can either try to build the diagram directly or use your use cases and a DFD to help you identify appropriate entities and attributes. Indicate cardinality and modality using crow's foot notation. Label the relationships and list the attributes, indicating the identifiers.
- Keep your diagram simple, don't make complicated assumptions.
- Stick to the case presented in this assignment, don't bring in details from the previous assignments with the same case.
- List non-obvious assumptions on the ERD