Lab W04 – Conceptual Design

Objective: You will create an ERD that models the data requirements identified in your requirements analysis.

This artifact will guide future work in this lab. Vague diagrams, poor designs, and decisions at this stage will have consequences later in the semester.

Note: Do not use generative AI (considered a violation of academic integrity).

Crow's Foot ERD

You will create a crow's foot ERD in a diagram tool (Draw.io, Inkscape, or Lucidchart) to represent the system.

Your ERD must include:

- All entities
- Relevant attributes for each entity
- Primary keys
- Foreign keys
- Relationships between entities
- Cardinality and participation constraints

The ERD should represent the system at a conceptual level, not a physical database design. Do not include SQL-specific details such as data types or indexing.

Design Guidelines

- Model users, roles, and permissions explicitly where appropriate
- Use associative entities to resolve many-to-many relationships
- Use the proper symbols to identify the components correctly
- Bold all primary keys and mark with PK (see lecture examples)
- Bold foreign keys as appropriate, and marked with FK (see lecture examples)
- Consider all ERD design principles we have covered and use appropriately
- Note: You are expected to update your requirements document as you resolve design issues

Evaluation Criteria

Grading Breakdown

- Objective Criteria: 60%
- Subjective Evaluation: 40%

Both parts matter. A diagram that is neat but incorrectly modeled will not score well, and neither will a technically correct diagram that is unclear, incomplete, or poorly reasoned.

Objective Criteria (60 points)

The objective portion of the grade is based on whether the ERD correctly applies Crow's Foot notation and fundamental data modeling principles. This includes:

- Correct Use of Crow's Foot Notation
    - Entities are clearly identified and consistently named
    - Primary identifiers are correctly identified

    - Relationships use correct cardinality and optionality symbols
    - Many-to-many relationships are resolved using associative entities
- Structural Correctness
    - Each entity represents a single, well-defined concept
    - Attributes are placed on appropriate entities
    - No apparent redundancy or attribute duplication
    - Weak entities are modeled correctly, where applicable
- Alignment with Requirements and Business Rules
    - All major data requirements are represented
    - Key business rules are reflected in relationships or constraints
    - No unexplained entities or relationships appear
- Diagram Quality
    - Diagram is legible, consistently formatted, and readable
    - Naming conventions are clear and professional
    - Relationships are not ambiguous or visually confusing

Subjective Evaluation (40%)

The subjective portion of the grade evaluates the quality of modeling decisions where multiple correct solutions are possible. This portion considers:

- Appropriateness of Design Choices
    - Are entities defined at the right level of abstraction?
    - Are roles, permissions, and approvals modeled reasonably?
    - Are associative entities used when they add clarity?
- Thoughtfulness and Anticipation
    - Does the model anticipate future requirements implied by the scenario?
    - Are constraints modeled in a way that supports later implementation?
    - Does the design avoid unnecessary complexity?
- Consistency and Coherence
    - Does the diagram read as a cohesive model rather than a collection of parts?
    - Are similar concepts modeled consistently across the diagram?
- Evidence of Effort
    - Does the diagram appear carefully constructed and revised?
    - Are naming and structure deliberate rather than accidental?

Submission

- Save the diagram in the application's native format. Do not convert it into another format.
- Name the file 'lastERD' or 'lastlastERD' like we did in the previous lab. The filename extension will depend on the application you used.
- Upload and commit the diagram to the labs folder.
- Place "done" in the Moodle submission textbox for Lab W04.