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Entity Relationship Diagram

Data Modeling

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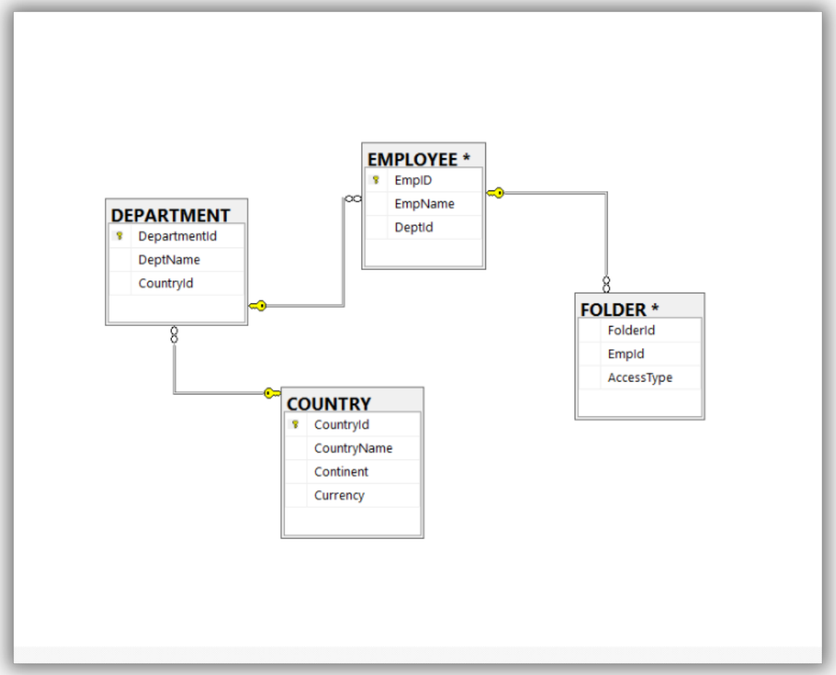
Agenda

- What is ER diagram?
- Why Entity Relationship is important?
- Components of an Entity Relationship diagram
- Create Entity Relationship Diagram in SSMS
- Data model vs Entity Relationship diagram

What is Entity Relationship Diagram?

An ER (Entity-Relationship) diagram is a visual representation that illustrates the entities (objects or concepts), attributes (properties or characteristics), and relationships between entities within a system. It's a popular tool used in database design and conceptual modeling.



Why Entity Relationship is important?

Database Design

They allow designers to conceptualize the entities within the system, their attributes, and the relationships between them. This understanding is fundamental in creating a well-organized, efficient database structure.

Identifying Relationships

ERDs help in identifying and defining the relationships between entities (such as one-to-one, one-to-many, many-to-many). Understanding these relationships is essential for maintaining data integrity.

Normalization

Normalization is a technique used to reduce data redundancy and improve data integrity. ERDs aid in identifying dependencies and normalizing the database structure.

Planning and Scalability

ERDs help in planning for scalability and future modifications. Designers can anticipate potential changes and adapt the database structure accordingly.

Components of Entity Relationship Diagram

Entity

Objects or concepts in a system that are represented by rectangles in the diagram.

Attributes

Attributes represent properties or characteristics of entities and are depicted within the entity boxes.

Relationships

Relationships describe how entities are related to each other. They are represented by lines connecting the entities and typically labeled to define the nature of the relationship (e.g., one-to-one, one-to-many, many-to-many).

Cardinality

Cardinality in ER diagrams indicates the number of instances of one entity that can be associated with the number of instances of another entity through a relationship. It defines the participation of entities in a relationship (such as one-to-one, one-to-many, or many-to-many).

Create Entity Relationship Diagram in SSMS

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Data model vs Entity Relationship diagram

- ERD is a visual representation of the data model, but they are not precisely the same thing.
- Data model is a more comprehensive concept. It refers to an abstract model that organizes elements of data and how they relate to each other and the real world. A data model can be represented in various forms, such as:
  - Conceptual Data Model: A high-level, abstract representation of the overall structure and relationships of data. It focuses on entities and their relationships.
  - Logical Data Model: This model defines the structure of the data elements, their relationships, and constraints in detail.
  - Physical Data Model: This model represents the actual implementation of the database on a specific database management system, including details like data types, indexing, keys, and other physical implementation aspects.