**CONCEPTUAL DATA MODELING**

**Entity-relationship (ER) diagram**

An entity-relationship (ER) diagram is a specialized graphic that illustrates the [relationships between entities in a database](http://databases.about.com/od/specificproducts/a/Database-Relationships-An-Introduction-To-Foreign-Keys-Joins-And-E-R-Diagrams.htm). ER diagrams often use symbols to represent three different types of information. Boxes are commonly used to represent entities. Diamonds are normally used to represent relationships and ovals are used to represent attributes.

ERD elements

1. **Entity** is something that has a distinct, separate existence which is recognized as being capable of an independent existence and which can be uniquely identified. entity may be a physical object such as a house or a car, an event such as a house sale or a car service, or a concept such as a customer transaction or order. Entities can be thought of as [nouns](http://en.wikipedia.org/wiki/Noun). Examples: a computer, an employee, a song, a mathematical theorem.



1. **Relationship** captures how two or more entities are related to one another. Relationships can be thought of as [verbs](http://en.wikipedia.org/wiki/Verb), linking two or more nouns. Examples: an *owns* relationship between a company and a computer, a *supervises* relationship between an employee and a department, a *performs* relationship between an artist and a song, a *proved* relationship between a mathematician and a theorem.



1. **Attributes** are the characteristics properties of Entities and relationships .

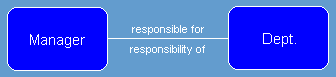


**Cardinality**

Cardinality specifies how many instances of an entity relate to one instance of another entity.Ordinality is also closely linked to cardinality. While cardinality specifies the occurences of a relationship, ordinality describes the relationship as either mandatory or optional. In other words, cardinality specifies the maximum number of relationships and ordinality specifies the absolute minimum number of relationships.

**Cardinality**

1. **One-to-one**: An entity in A is associated with at most one entity in B, and an entity in B is associated with at most one entity in A.



1. **One-to-many**: An entity in A is associated with any number in B. An entity in B is associated with at most one entity in A. 

**Many-to-one**: An entity in A is associated with at most one entity in B. An entity in B is associated with any number in A.

1. **Many-to-many**: Entities in A and B are associated with any number from each other.



