ER Diagrams

Transforming to a Relational Schema

The process of transforming an ER diagram to a relational schema is relatively straightforward.

There are five simple steps to be followed:

1. Each entity on the ER diagram becomes a table in the database
   - Take each entity name
   - Make it ***plural*** to distinguish relations from entities.

   For example:

   Stock( )

   Customers( )

2. The identifying attribute of the entity becomes the primary key of the table.

   For example:

   Stock(StockNo,……..)

   Suppliers(SuppNo,……..)

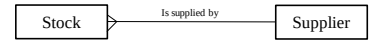
3. All other attributes of the entity become non-key attributes of the table.

   For example:

   Stock(StockNo, Description, CostP, SaleP, Qty)

   Suppliers(SuppNo, Name, TelNo)

4. For each one-to-many relationship, post the primary key of the ***one*** table into the table representing the ***many*** end of the relationship.



Becomes:…

Stock(StockNo, Description, CostP, SaleP, Qty, SuppNo)

Suppliers(SuppNo, Name, TelNo)

5. Optionality on the ***many*** end of the relationship tells us whether the foreign key representing the relationship can be NULL or not.

   If the ***many*** end is mandatory, then the foreign key cannot be NULL.

   If the ***many*** end is optional, then the foreign key can be NULL.

What about ***many-to-many*** or ***one-to-one*** relationships?

Many-to-many relationships are difficult to accommodate when transforming to the relational schema.

It is therefore recommended that many-to-many relationships are decomposed into ***two*** one-to-many relationships.

To do this, we introduce a link entity (***Weak*** entity type) to connect the original two entity types.

NOTE: that the ***many*** ends of the relationships always appear at the link entity.

One-to-one relationships can normally be handled as a single table.

i.e. take both entities in a 1:1 relationship and feed the attributes into one table structure.

For each ***role*** representing a one-to-many relationship we need a distinct foreign key.

A one-to-many recursive relationship is transformed to one table with a foreign key which is effectively the primary key.

(many-to-many recursive relationships are need to be broken down into two one-to-many relationships as discussed earlier)

Exercise

Transform the ER diagram produced in the last exercise into a relational schema.