

Comp2411 Tutorial No. 2:

1. Explain the difference between physical and logical data independence.

Answer: Available from the 1st week's lecture notes!

Basic Concepts and Terminologies

■ *Data Independence*

- ◆ the ability to modify a schema definition in one level without affecting a schema in the next higher level
- ◆ there are two kinds (a result of the 3-level architecture):
 - ◆ ***physical data independence***
 - *the ability to modify the physical schema without altering the conceptual schema and thus, without causing the application programs to be rewritten*
 - ◆ ***logical data independence***
 - *the ability to modify the conceptual schema without causing the application programs to be rewritten*

Example?

2. Discuss the need to have "ternary" relationships in ER design:

- a) Is it possible to replace a ternary relationship by a set of binary ones? Why or why not?
- b) For a ternary relationship R, if one of the entity sets linked by R is a weak entity set, how do we convert R into a table?

Answer:

- a) refer to the examples given in the lecture notes of Week 2 (*see below*)

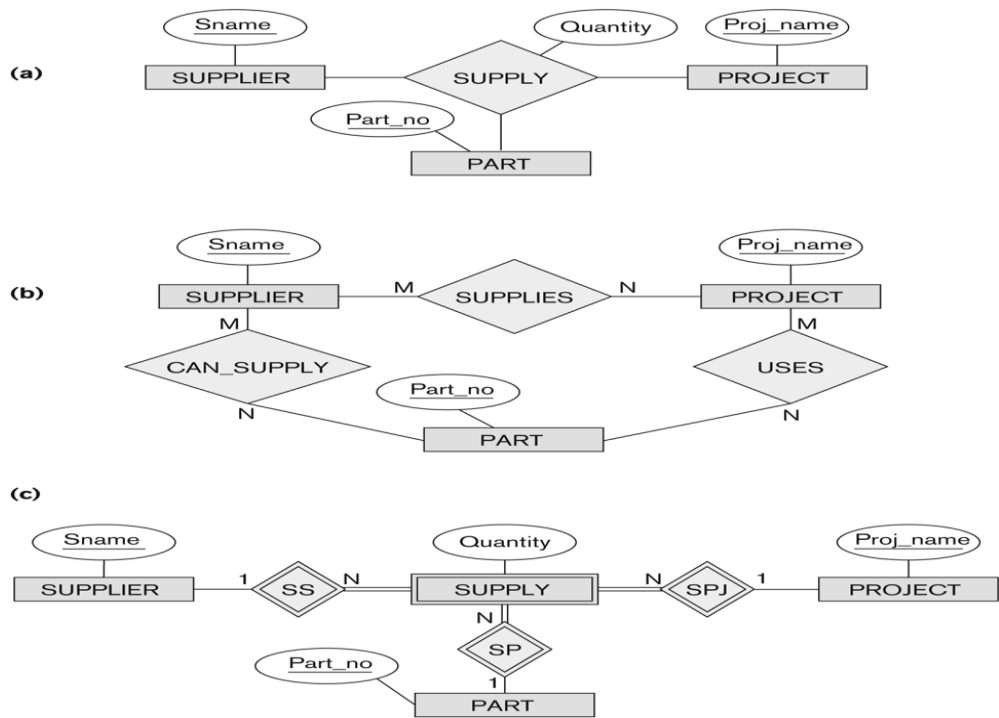


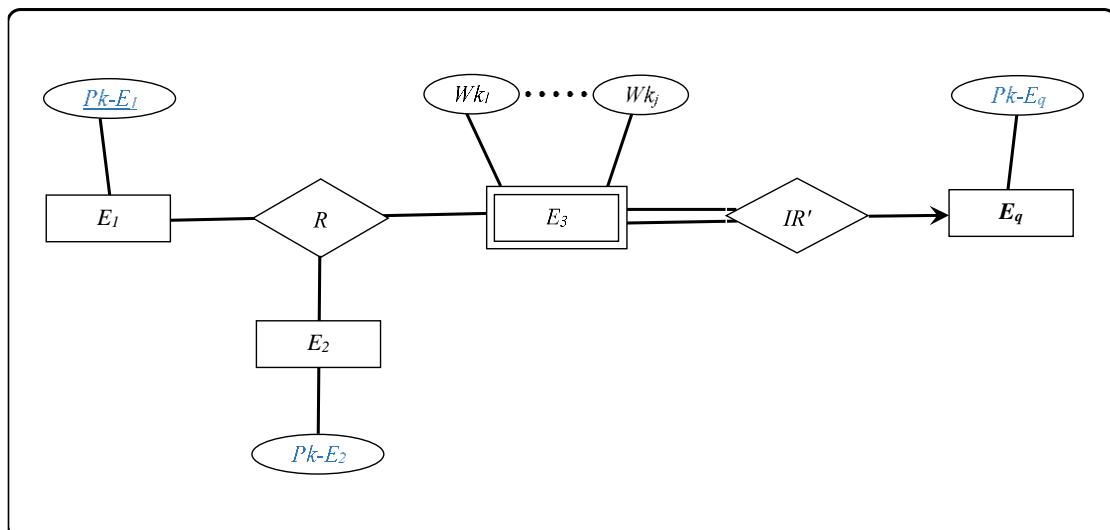
Figure 3.17
Ternary relationship types. (a) The SUPPLY relationship. (b) Three binary relationships not equivalent to SUPPLY. (c) SUPPLY represented as a weak entity type.

Could you use your own example?

b) *See the following:*

Let's assume the weak entity set E_3 has a set of “weak key” attributes (also called “partial key” attributes) $Wk_1 \dots Wk_j$, and that E_3 is dependent on another (strong) entity set E_q whose primary key is $Pk-E_q$.

Then to convert the ternary relationship R into a table also called R , the primary keys of E_1 and E_2 (say, $Pk-E_1$ and $Pk-E_2$) shall become the corresponding attributes in table R , as well as the weak-key attributes $Wk_1 \dots Wk_j$ plus the primary key of E_q (ie, $Pk-E_q$)!



3. Design an ER schema (diagram) for a database application that you are familiar with. Indicate all constraints that you know should hold on the database, either directly on the diagram if appropriate or in text.

(Preferably, the schema is a reasonably rich one, e.g., it has at least 5 entity types, 4 relationship types, one weak entity type, and an n-ary ($n > 2$) relationship type. This diagram will be used in subsequent tutorials.)

May reference to the ER diagram below to have your own answer.

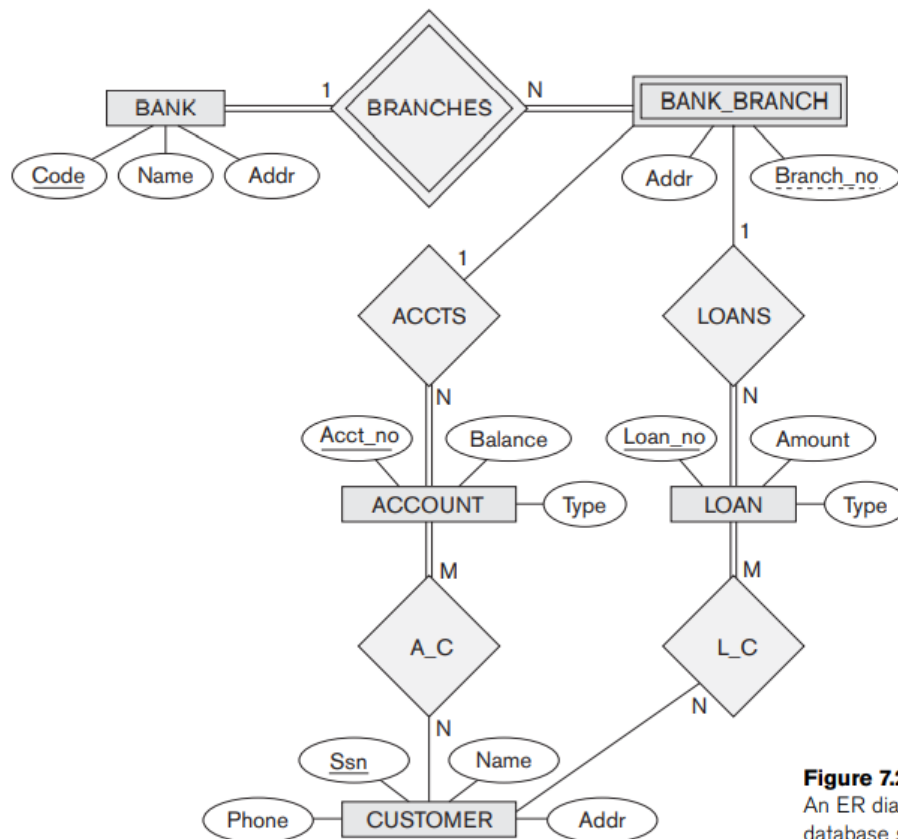


Figure 7.21
An ER diagram for a BANK database schema.