

Fifth Lecture

Some Solved Examples about ER Model

Example(1): Draw the ER-Model for a "COMPANY" which has the attributes (CName, CType, CId, CAddress, CProduct_Name, CAgent) that have Two relations, the first one is (Purchasing) with "MATERIAL" which has the attributes (MName, MSupplier, MMan_Date, MExp_Date, MExp_Time, MUnit_Price). The second relation is (Marketing) with "PRODUCT" which has the attributes (PName, PId, PUnit_Price, PUsage).

Note that there is an attribute Marketing_Date applied on the relationship (Marketing)

Solution:

A: There are three entity types (COMPANY, MATERIAL, PRODUCT)

The attributes for COMPANY are: CName, CType, CId, CAddress, CProduct_name, CAgent

1. CAddress is a composed attribute, at least (Buildind_No and Street_No)
2. The COMPANY has many Agents, so CAgent is a multivalued attribute.
3. CId is the primary key for entity type "COMPANY"

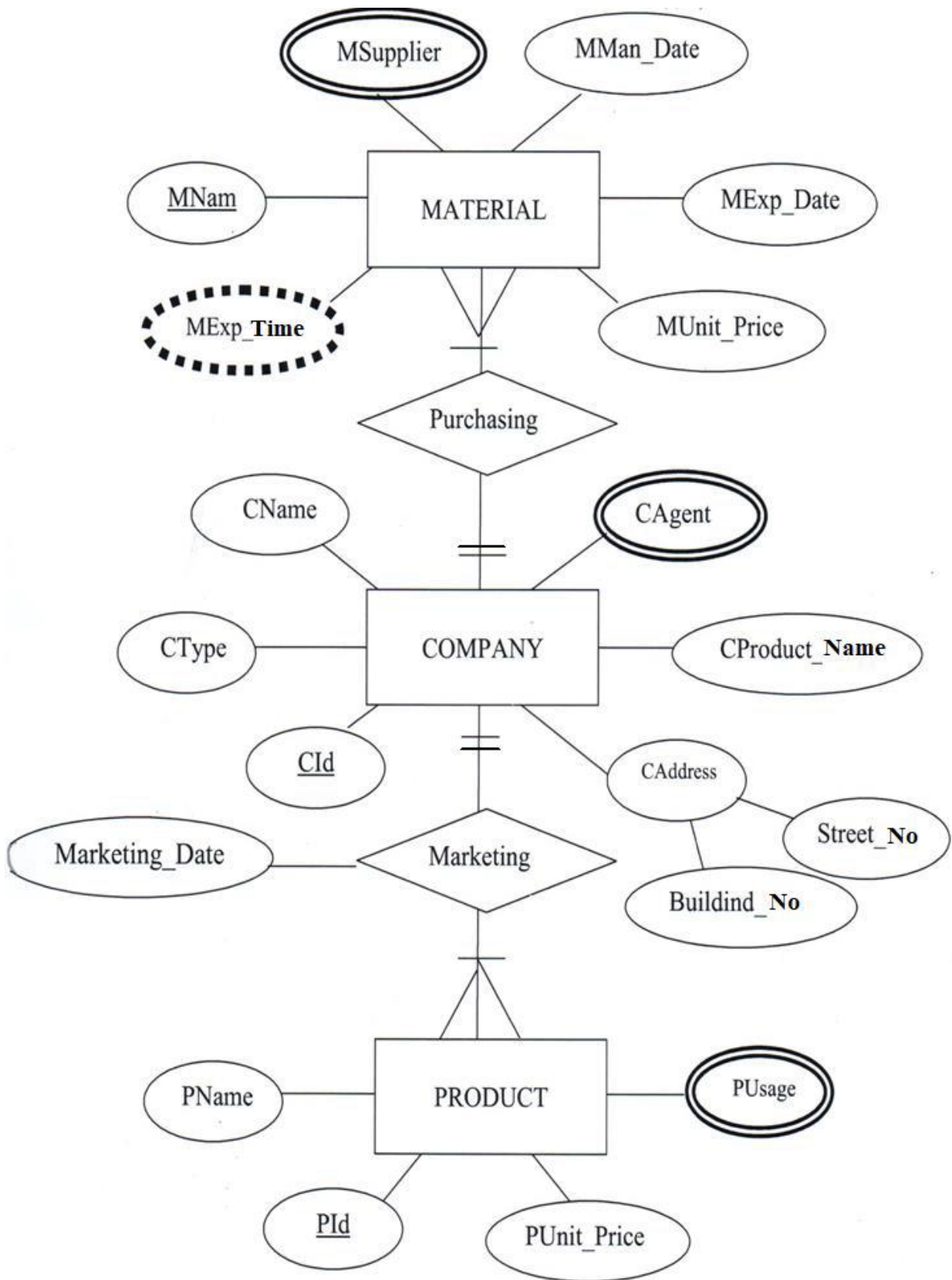
The attributes for MATERIAL are: MName, MSupplier, MMan_Date, MExp_Date, MExp_Time, MUnit_Price

1. The MSupplier is a multivalued attribute since we can have more than one supplier for the MATERIAL.
2. MExp_Time is calculated from (MMan_Date – Mexp_Date), so it is derived attribute.
3. MName is the primary key for material

The attributes for PRODUCT are: PName, PId, PUnit_Price, PUsages

1. We can expect there are many usages for one product, so is a multivalued attribute.
2. the primary key for the product is PId.

B: there are two relations (Purchase & Marketing). Marketing has an attribute (Marketing_Date), the relation from Company to Material is one –to-many, and from Company to Product is also one –to-many, Since the company can buy many materials, and sell many products, all of them are mandatory because the company in this example should buy material to produce a Products, and the all the relations are binary.



Example (2):

Suppose you have a Mathematical PROBLEM to solve, you need VARIABLES to use, and OPERATORS. How can you represent that in ER-Diagram? If you know that the attributes for PROBLEM (Problem_No, Problem_Degree, Problem_Body), VARIABLES (Variable_Name, VData_Type), and OPERATORS are (Operator_Symbol, Operator_Operands). The relation among the Three entity types is "Solve" which have the attribute (No_Of_Variables).

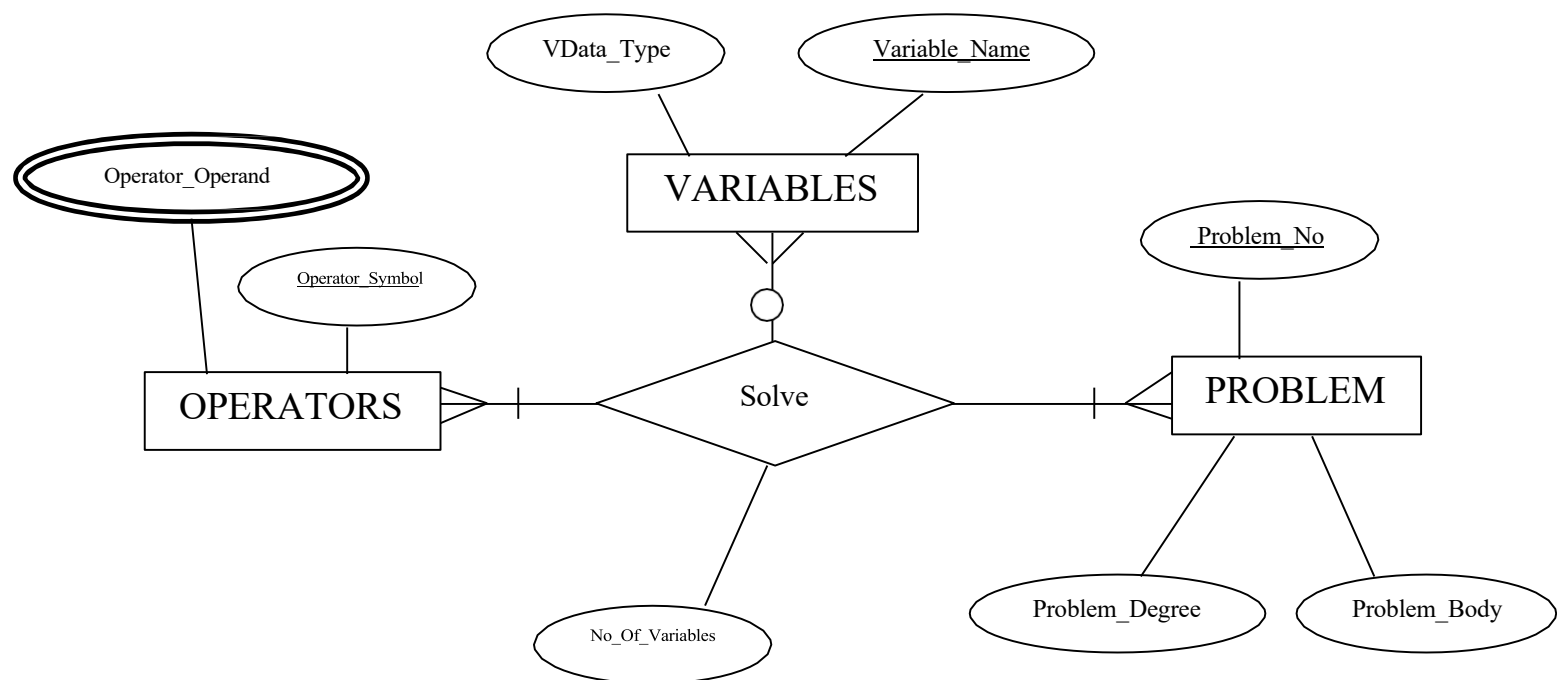
The Solution:

A: we have three entity types: PROBLEM, VARIABLES, and OPERATORS

1. For the PROBLEM, Problem_No is the primary key.
2. For the VARIABLES Variable_Name is the primary key, and Operator_Operand may have more than one so it is a multivalued attribute
3. For the OPERATORS, the Operator_Symbol is the primary key.

B: We have one relationship (Solve).

Here we have a ternary relationship, all of them are many to many, mandatory for OPERATORS and PROBLEM, optional for VARIABLES, and the diagram as follows:



Since we can Add a new attribute to the Relationship Problem_Name which is the primary key, we can get an associative entity (PROBLEM_SOLVING) as follows:

