**Lab 2 : Constraints in the E/R Model**

**We have the database consist of 5 relations:**

Product (ProductCode, Name, PurchasePrice, SellPrice, Type, SupplierCode)

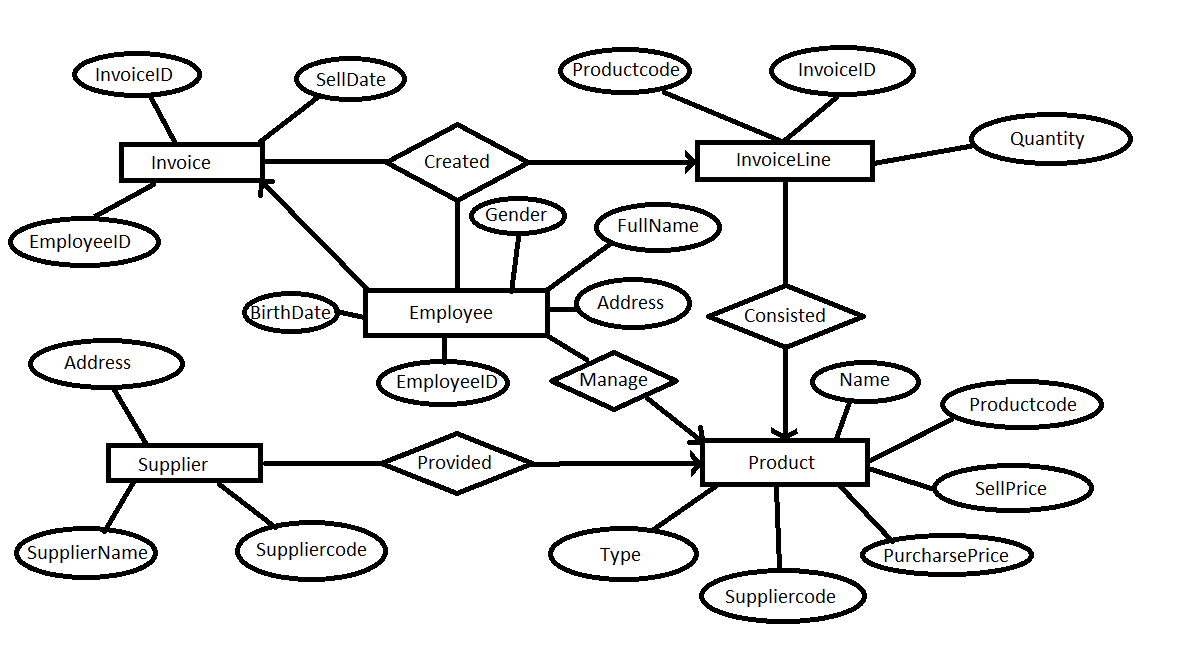
Supplier (SupplierCode, SupplierName, Address)

Employee (EmloyeeID, FullName, Gender, BirthDate, Address)

Invoice (InvoiceID, SellDate, EmployeeID)

InvoiceLine(ProductCode, InvoiceID, Quantity)

**Exercise 1: Draw an ER model corresponding to the database above**



**Exercise 2: Use Relational Algebra to express following constraints:**

1. The sell price must be higher than the purchase price.

F: = ∅

1. A product of Samsung must be television, mobile or tablet.

R1 = Product ⋈ Supplier

SupplierName <> “Samsung” and ( Type <> “television” and Type <> “mobile” and Type <> “tablet”) (R1) = ∅

1. No supplier of mobile’s or tablet’s may also supply food.

Supplier(type!=mobile && type!=tablet) || supplier(type!=food) = ∅

) (product join supplier) = ∅

∅

Sửa 3:

R1 =chiếu SupplierCode(Select Type =Mobile or Type = “tablet”)®

R2 =chiếu SupplierCode(SelectType = “food”)®

R1 giao R2 = ∅

No product may appear more than one time in an invoice.

1. The quantity of each product in each invoice should be greater than 0.

F :Quantity <= 0 (InvoiceLine)

1. There is no invoice without product.

F: InvoiceID <> null and ProductCode = null(InvoiceLine)

1. If purchase price is less than 500.000 VND, the sell price could not be greater than 9.000.000 VND.

**F :**

1. The sell price could not be greater than 2 times the purchase price.

T: **(**SellPrice <= (PurchasePrice \* 2)) (Product)∅

F: ∅

1. The gender of an employee should be “Male” or “Female”.

T: (Gender= ‘Male’ or Gender ‘Felmale’)(Employee)

∅

1. With the same purchase price, the sell price of two products could not have the difference more than 0.5 times of the purchase price.

R1:= p(Product)

R2:= p(Product)

**F :**∅