Exercises Data Warehousing
From Operational to Multidimensional Databases
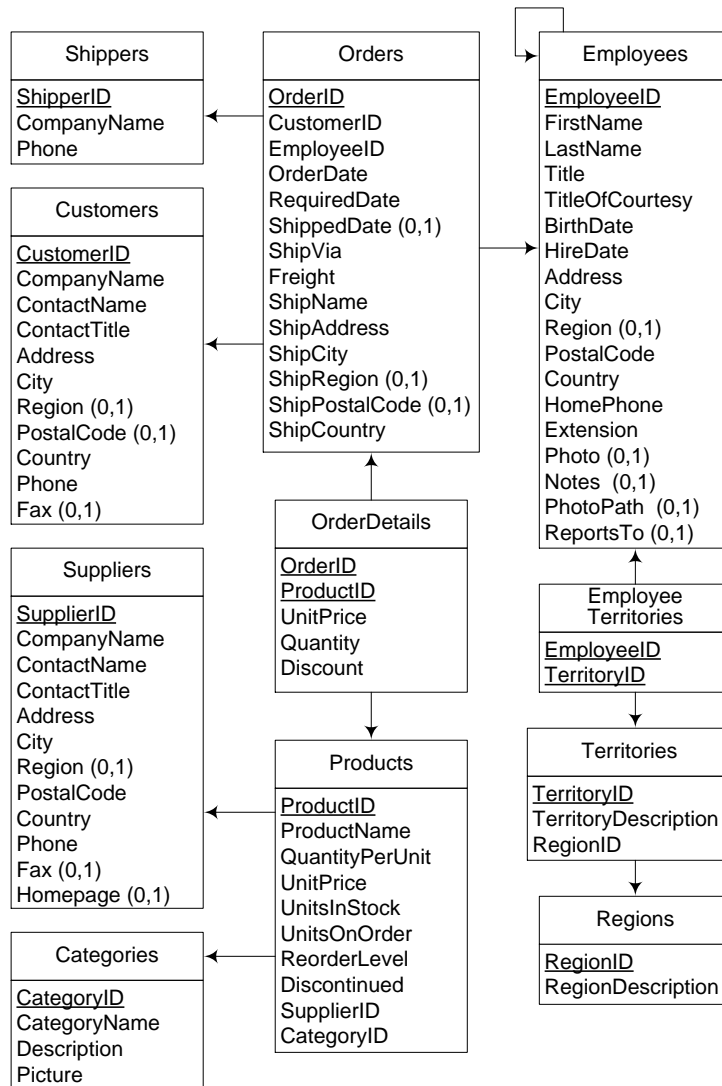
Solutions

Figure 1: Schema of the Northwind database

Consider the Northwind operational database whose schema is given in Figure 1. This database contains information of orders placed by customers. For every order the detail is given of what products were sold, for what unit price and in what quantity. The employee that secured the order is recorded as well as the date in which the order was inserted. For customers the city they live in etc. is recorded, and for employees their sales district.

For this database, create a data warehouse that will be used for analyzing the sales of the organization. Justify your choices.

One possible conceptual schema for the data warehouse is given in Figure 2 and its relational schema is gien in Figure 3.
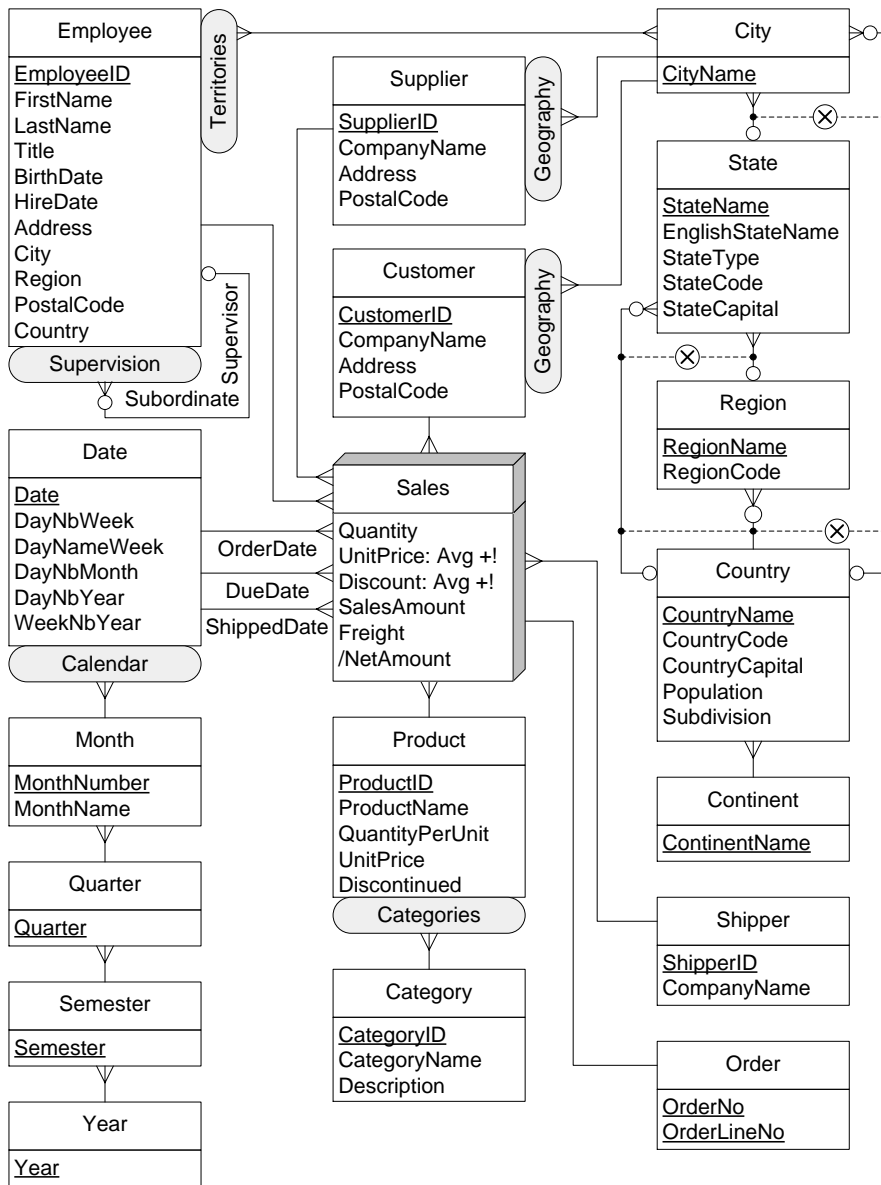
Figure 2: Conceptual schema of the Northwind data warehouse

Product

ProductKey
ProductName
QuantityPerUnit
UnitPrice
Discontinued
CategoryKey

Category

CategoryKey
CategoryName
Description

Supplier

SupplierKey
CompanyName
Address
PostalCode
CityKey

Sales

CustomerKey
EmployeeKey
OrderDateKey
DueDateKey
ShippedDateKey
ShipperKey
ProductKey
SupplierKey
OrderNo
OrderLineNo
UnitPrice
Quantity
Discount
SalesAmount
Freight

AK: (OrderNo,
OrderLineNo)

Customer

CustomerKey
CustomerID
CompanyName
Address
PostalCode
CityKey

AK: CustomerID

Territories

EmployeeKey
CityKey

Date

DateKey
Date
DayNbWeek
DayNameWeek
DayNbMonth
DayNbYear
WeekNbYear
MonthNumber
MonthName
Quarter
Semester
Year

AK: Date

Shipper

ShipperKey
CompanyName

Employee

EmployeeKey
FirstName
LastName
Title
BirthDate
HireDate
Address
City
Region
PostalCode
Country
SupervisorKey

City

CityKey
CityName
StateKey (0,1)
CountryKey (0,1)

State

StateKey
StateName
EnglishStateName
StateType
StateCode
StateCapital
RegionName (0,1)
RegionCode (0,1)
CountryKey

Country

CountryKey
CountryName
CountryCode
CountryCapital
Population
Subdivision
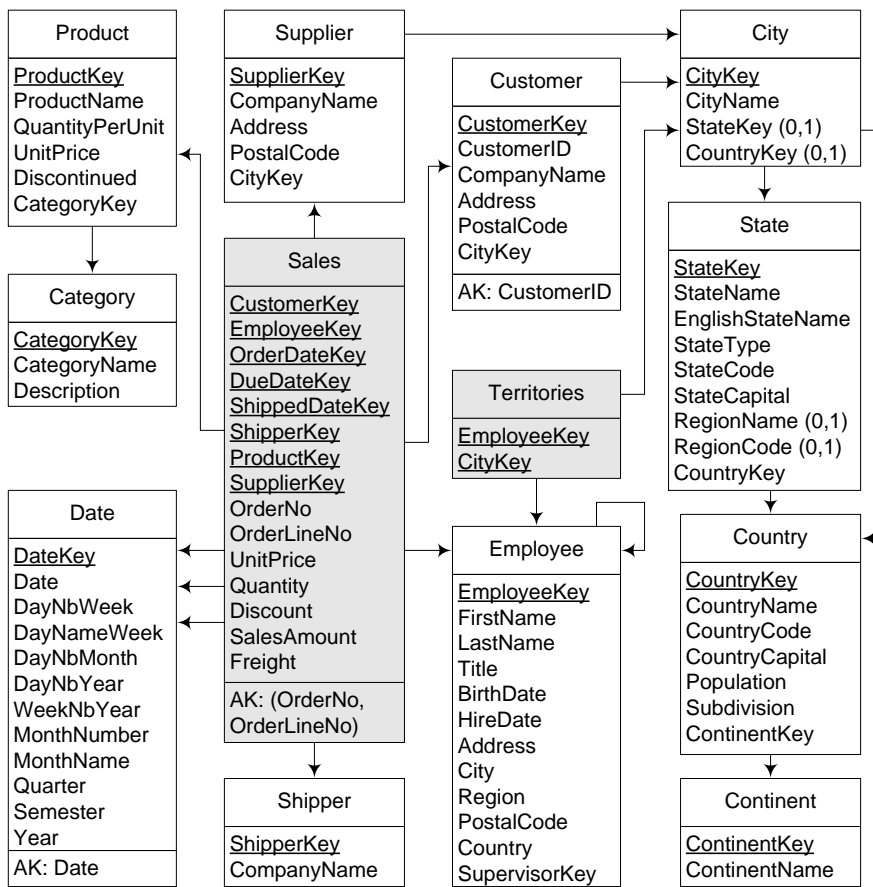ContinentKey

Continent

ContinentKey
ContinentName

Figure 3: Relational schema of the Northwind data warehouse