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PE03: Dimensional Modeling

Exercise 1: Identifying Facts and Dimensions

- Suppose a regional dairy products company employs you, and your task is to build the data marts for the overall data warehouse
- The company sells products to grocery stores, convenience stores, gas stations, and mass merchandisers
- You will be extracting data from the **Product Returns** operational system and **Sales Forecast spreadsheet**
- Identify each field
    - D - a dimensional attribute
    - F - a fact
    - O - operational only, not to be included

D/F/O	Product Returns
D	Customer Account Number
D	Product Category
D	Product Brand
D	Customer Name
D	Product Expiration Date
D	Product #
D	Product Description
D	Package Type
D	Plant Number
D	Manufacturing Line
O	Regular/Low fat
D	Customer Ship to Street Address
D	Customer Ship to City
D	Customer Ship to State
D	Customer Ship to Country
D	SKU (Stock Keeping Unit)
F	Returned Quantity
D	Returned Reason
F	Expired Quantity
F	Damaged Quantity
D	Damaged Code
D	Returned Date
D	Sales Rep
D	Sales Region

D/F/O	Sales Forecast
D	Account Rep
D	Month
D	Item #
D	Item Description
F	Forecast Units
F	Forecast Amount
F	Valid Forecast Flag

Exercise 2: Identifying Dimensions and Fact Groups

Using the same extract files that you used in Exercise #1, identify the following:

- Possible dimensions
- Possible fact groups (facts in each data mart)

Possible Dimensions

1. **Customer_Dimension**
2. **Product_Dimension**
3. **Manufacturing_Dimesion**
4. **Returned_Dimesion**
5. **Sales_Dimension**
6. **Return_Date Dimension**
7. **Expiration_Date**
8. **Account_Dimension**
9. **Item_Dimension**
10. **Sales_Date**

Fact Groups

1. **Product_Return_Fact**
2. **Sales_Forecast_Fact**

_____

_____

_____

_____

Exercise 3: Designing Dimensions

Design (i.e., draw a diagram of) each of the dimensions that were identified in Exercises 1 & 2. Follow the dimension representation shown on slide #8 of Week 4 Lecture notes). Specifically:

- Identify dimension attributes
- Identify all hierarchies of the attributes within a dimension

Exercise 4: Designing Fact Groups

Design each of the fact groups that were identified in Exercises #1 & #2. Specifically, for each fact group (data mart):

- list the facts that relate to the process that the fact group represents
- write a description for the fact – i.e., define it
- state the default aggregation rule ("sum" if additive; "semi-additive over time" if semi-additive; "N/A" if non-additive)

Fact Group: Product_Returned_Fact

Fact Name	Fact Description	Default Aggregation Rule
Returned Quantity	The total number of products that were returned	SUM
Damaged Quantity	The total number of products that were damaged.	Sum
Expiration Quantity	The total number of items that were found damaged.	Semi-Additive

Fact Group: Sales_Forecast_Fact

Fact Name	Fact Description	Default Aggregation Rule
Forecast Units	The number of units that were forecasted as the sale.	SUM
Forecast Amount	The total amount calculated from the sales forecast	SUM

Exercise 5: Create the Data Mart Matrix

The data mart matrix shows the relationship between the possible data marts and dimensions. Any dimension (column) with more than one X implies that this dimension must be conformed across multiple data marts to fit into the Data Warehouse Bus Architecture.

Fill in the data mart matrix using the following table:

Data Mart	Customer	Product	Manufacturer	Return	Return _Date	Sales	Expiration _Date	Item	Account	Sales _Date
Product _Return_Fact	X	X	X	X	X	X	X			
Sales_Forcast _Fact						X		X	X	X

Exercise 6: Logical Table Design

Use the dimensional models that you have created so far to:

- Design the actual star schema for each of the fact groups that you defined in Exercise #4.
- Create your Dimensional Models using MySQL Workbench and save it as a pdf file.
- Submit a zip file containing 1) a copy of the answered PE03 and 2) pdf file of EER diagrams to MyCourses PE03 Dropbox by 11:59 PM, Sunday 9/20/2020.
- Bring a hard copy of the answered PE03 & EER pdf to Monday (9/21/20) in-person class.

Name: _____

Graded By: _____

PE03: Dimensional Modeling Grade sheet

Requirements	Grade	Grade Earned
Exercise 1: Identifying Facts and Dimensions		
- Identify all the attributes correctly	10	
Exercise 2: Identifying Dimensions and Fact Groups		
- Dimensions	6	
- Fact Groups	4	
Exercise 3: Designing Dimensions		
- Identify all dimensions' attributes	8	
-		
- Identify all hierarchies of the attributes	5	
Exercise 4: Designing Fact Groups		
- Fact groups	2	
- All the facts are included with the fact groups	5	
- Fact descriptions and aggregation rules	5	
Exercise 5: Create the Data Mart Matrix	9	
Exercise 6: Logical Table Design		
- Dimensions	16	
- Fact tables	8	
- Conformed dimension	8	
- Correct primary keys and foreign key constraints	5	
- Relationships between fact tables and dimensions	9	
- Submit star schema to Dropbox & bring a hard copy	-20	
Total Grade:	**100**	