

Building a Dimension Table

In SQL, a dimension table is a table that contains descriptive attributes or context for the quantitative data stored in a fact table within a data warehouse or analytical database. Dimension tables provide additional information about the facts in the fact table, allowing for more comprehensive analysis and reporting. Here are key characteristics and components of dimension tables:

1. **Descriptive Attributes:** Dimension tables store descriptive attributes or characteristics that provide context to the facts stored in the associated fact table. These attributes are often non-numeric and represent various dimensions or aspects of the business, such as time, geography, product, customer, or sales channel.
2. **Primary Key:** Each dimension table typically has a primary key that uniquely identifies each record or row in the table. This primary key is often referenced as a foreign key in the fact table to establish relationships between the fact and dimension tables.
3. **Denormalized Structure:** Dimension tables are usually denormalized, meaning that redundant data may be stored to optimize query performance and simplify queries. Denormalization can involve storing aggregated data or pre-joining related attributes within the dimension table.
4. **Hierarchical Relationships:** Dimension tables may represent hierarchical relationships between attributes. For example, a time dimension table may include hierarchical levels such as year, quarter, month, day, and hour.
5. **Lookup Values:** Dimension tables often serve as lookup tables for the fact table, allowing analysts and users to easily interpret the numerical facts by referencing descriptive attributes. For example, a sales fact table might include foreign keys pointing to a product dimension table to identify the product associated with each sale.
6. **Support for Slicing and Dicing:** Dimension tables enable slicing and dicing of data, which involves analyzing and disaggregating facts along different dimensions. This allows for multidimensional analysis and exploration of data to uncover insights and patterns.
7. **Slowly Changing Dimensions (SCDs):** In some cases, dimension tables may include attributes that change over time. Techniques such as slowly changing dimensions (SCDs) are used to manage these changes and maintain historical data integrity within the data warehouse.

Use Cases of Dimension Table:

Dimension tables play a crucial role in organizing and providing context to the data stored in fact tables within a data warehousing environment. Here are some common use cases for dimension tables in SQL:

1. Time Dimension:

- Recording time-related attributes such as year, quarter, month, day, hour, and minute.

- Facilitating time-based analysis, such as comparing sales performance across different time periods, identifying seasonal trends, and analyzing customer behavior over time.

2. Product Dimension:

- Storing product attributes such as product name, category, brand, price, and specifications.
- Supporting product-related analysis, including sales by product category, top-selling products, product performance over time, and product profitability.

3. Customer Dimension:

- Capturing customer attributes such as customer ID, name, address, demographics, and purchase history.
- Enabling customer-centric analysis, such as customer segmentation, lifetime value analysis, customer churn prediction, and personalized marketing campaigns.

4. Geographic Dimension:

- Recording geographic attributes such as country, region, state, city, and postal code.
- Supporting geographic analysis, including sales by region, market penetration analysis, territory management, and location-based targeting.

5. Employee Dimension:

- Storing employee-related attributes such as employee ID, name, position, department, and tenure.
- Facilitating workforce analysis, including employee performance evaluation, workforce demographics, organizational hierarchy analysis, and staffing optimization.

6. Promotion Dimension:

- Recording promotion-related attributes such as promotion ID, promotion type, start date, end date, and discount rate.
- Supporting promotion analysis, including evaluating the effectiveness of marketing promotions, measuring promotional ROI, and optimizing promotional strategies.

7. Channel Dimension:

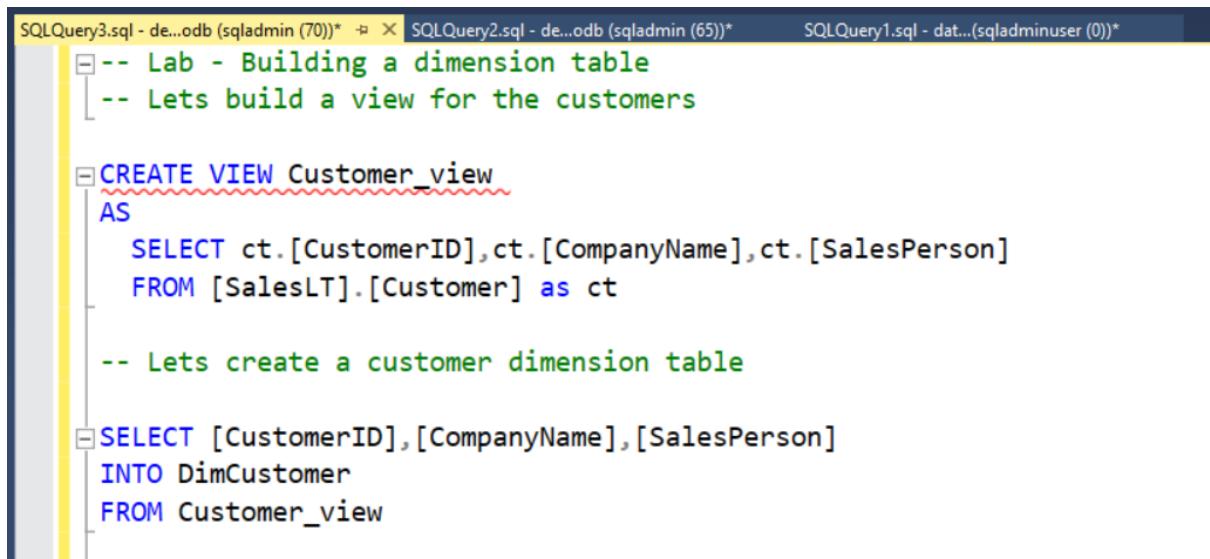
- Capturing attributes related to sales channels such as channel ID, channel name, channel type, and channel performance metrics.
- Enabling channel analysis, including sales distribution across different channels, channel profitability analysis, and channel optimization.

8. Supplier Dimension:

- Storing supplier-related attributes such as supplier ID, name, contact information, and product offerings.
- Supporting supplier analysis, including supplier performance evaluation, vendor management, and procurement optimization.

To begin with the Lab:

1. First you are going to create a new query from your SQL Database.
2. Then you are going to use this code over there.
3. First, we are going to create a create-for-customer table. After we will create our customer table.



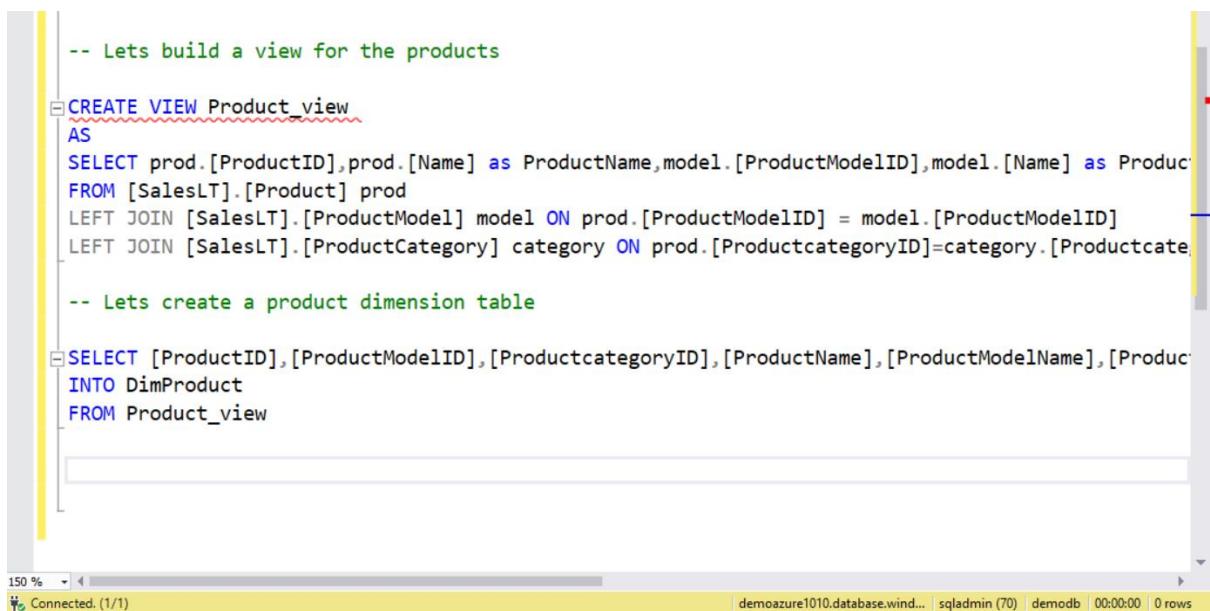
```
-- Lab - Building a dimension table
-- Lets build a view for the customers

CREATE VIEW Customer_view
AS
    SELECT ct.[CustomerID],ct.[CompanyName],ct.[SalesPerson]
    FROM [SalesLT].[Customer] AS ct

-- Lets create a customer dimension table

SELECT [CustomerID],[CompanyName],[SalesPerson]
INTO DimCustomer
FROM Customer_view
```

8. After that we will create the view for products then we will create the table for products.



```
-- Lets build a view for the products

CREATE VIEW Product_view
AS
    SELECT prod.[ProductID],prod.[Name] AS ProductName,model.[ProductModelID],model.[Name] AS ProductModelName
    FROM [SalesLT].[Product] prod
    LEFT JOIN [SalesLT].[ProductModel] model ON prod.[ProductModelID] = model.[ProductModelID]
    LEFT JOIN [SalesLT].[ProductCategory] category ON prod.[ProductcategoryID]=category.[ProductcategoryID]

-- Lets create a product dimension table

SELECT [ProductID],[ProductModelID],[ProductcategoryID],[ProductName],[ProductModelName],[ProductcategoryName]
INTO DimProduct
FROM Product_view
```

9. Now you are going to execute them one by one.
10. Now if you run the Select statement for customers then you can see the output accordingly.

```
SELECT * FROM DimCustomer
```

Results Messages

CustomerID	CompanyName	SalesPerson
1	A Bike Store	adventure-works\pamela0
2	Progressive Sports	adventure-works\david8
3	Advanced Bike Components	adventure-works\jillian0
4	Modular Cycle Systems	adventure-works\jillian0
5	Metropolitan Sports Supply	adventure-works\shu0
6	Aerobic Exercise Company	adventure-works\linda3
7	Associated Bikes	adventure-works\shu0
8	Rural Cycle Emporium	adventure-works\jose1
9	Sharp Bikes	adventure-works\jose1
10	Bikes and Motorbikes	adventure-works\gareth1
11	Bulk Discount Store	adventure-works\jae0
12	Catalog Store	adventure-works\michael9
13	Center Cycle Shop	adventure-works\pamela0
14	Central Discount Store	adventure-works\david8

Query executed successfully. demoazure1010.database.wind... | sqldadmin (74) | demodb | 00:00:00 | 847 rows

11. Now if you will execute a select statement for products then you can see all the details as well.

```
SELECT * FROM DimProduct
```

Results Messages

ProductID	ProductModelID	ProductcategoryID	ProductName	ProductModelName	ProductCategoryName
1	680	6	HL Road Frame - Black, 58	HL Road Frame	Road Frames
2	706	6	HL Road Frame - Red, 58	HL Road Frame	Road Frames
3	707	33	Sport-100 Helmet, Red	Sport-100	Helmets
4	708	33	Sport-100 Helmet, Black	Sport-100	Helmets
5	709	18	Mountain Bike Socks, M	Mountain Bike Socks	Socks
6	710	18	Mountain Bike Socks, L	Mountain Bike Socks	Socks
7	711	33	Sport-100 Helmet, Blue	Sport-100	Helmets
8	712	2	AWC Logo Cap	Cycling Cap	Caps
9	713	11	Long-Sleeve Logo Jersey, S	Long-Sleeve Logo Jersey	Jerseys
10	714	11	Long-Sleeve Logo Jersey, M	Long-Sleeve Logo Jersey	Jerseys
11	715	11	Long-Sleeve Logo Jersey, L	Long-Sleeve Logo Jersey	Jerseys
12	716	11	Long-Sleeve Logo Jersey, XL	Long-Sleeve Logo Jersey	Jerseys
13	717	6	HL Road Frame - Red, 62	HL Road Frame	Road Frames
14	718	6	HL Road Frame - Red, 44	HL Road Frame	Road Frames

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