Supply Chain Data Analysis - Notes

1. Introduction to Supply Chain

- **Definition: The supply chain is the network between a company and its suppliers to produce and distribute a specific product.**

Tool Used: Power BI

Feature explanation

-Product Type: The type of product associated with specific data in the supply chain.

-SKU (Stock Keeping Unit): Unique code used to identify a particular product.

-Price: The price of the product or item in the supply chain.

-Availability: Information about product availability.

-Number of Products Sold: The number of products that have been sold in a certain time period.

-Revenue Generated: Total revenue generated from product sales in a certain time period.

-Customer demographics: Information about customer characteristics, such as age, gender, geographic location, etc.

-Stock Levels: The number of products still available in stock at any given time.

-Lead Times: The time required to order or receive products from suppliers.

-Order Quantities: The number of products ordered in one order or shipment.

-Shipping Times: The time required to ship products from the warehouse or

distribution center to customers.

-Shipping Carriers: Companies or services used to ship products to customers.

-Shipping Costs: Costs associated with shipping products, including delivery fees and additional fees.

-Supplier Name: Name of supplier or vendor who provides products or materials to the company.

-Location: The physical location associated with the data in the supply chain, such as the location of a warehouse or distribution center.

-Lead Time: The time required to obtain products or materials from a particular supplier.

-Production Volumes: The number of products produced in a certain time period.

-Manufacturing Lead Time: The time required to produce a product, from ordering materials until the product is ready.

-Manufacturing Costs: Costs related to the production process, including raw material costs, labor, etc.

-Inspection Results: Results of product or material quality inspection.

-Defect Rates: The level of defects or defects in the products produced.

-Transportation Modes: The transportation mode used to send products, such as land, sea or air.

-Routes: Routes or paths used to send products from one point to another in the supply chain.

-Costs: Costs related to various aspects of the supply chain, including transportation costs, production costs, and other costs

2.Data Cleaning & Corrections

During the data cleaning phase, all datasets were thoroughly checked for accuracy, consistency, and completeness. Key tasks included:

- **Removing duplicates**
- **Handling missing values**
- **Standardizing formats (dates, categories, etc.)**
- **Verifying logical relationships between variables**
- **Outliers**

  All data points were accurate and well-structured, with no major issues found — except one:

  Incorrect Revenue Calculation

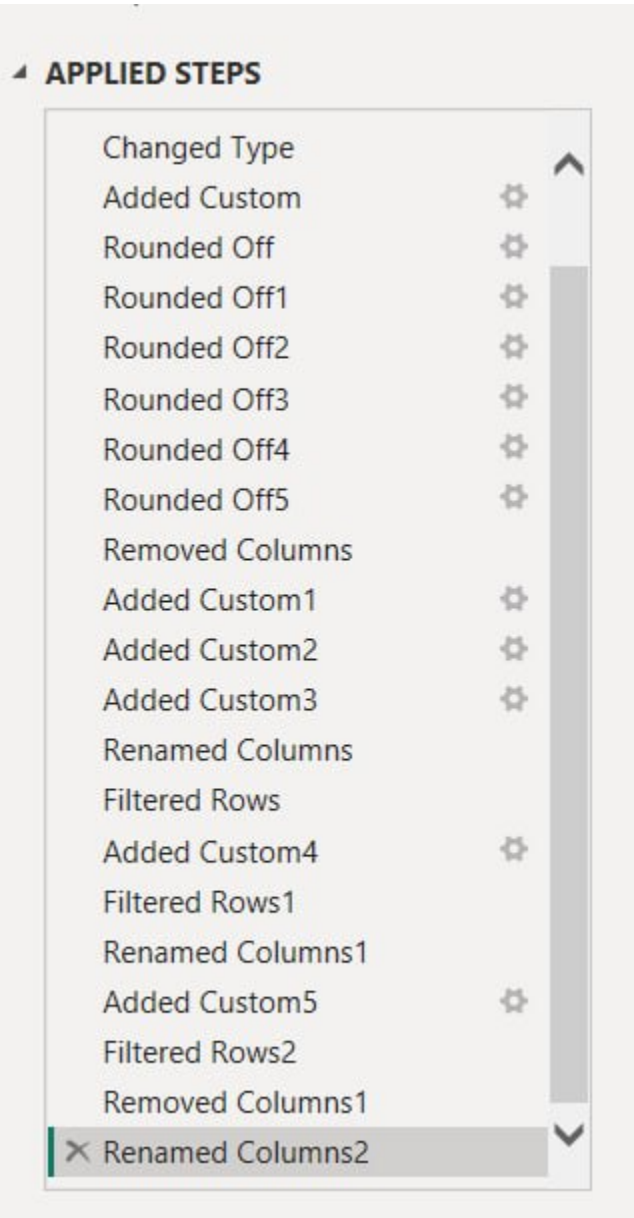
  The revenue was initially calculated incorrectly.

  After review, we corrected the formula to:
  Revenue = Number of Products Sold × Price per Unit

Data Adjustments - Lead Time Terminology

- **The previously ambiguous lead times were renamed to better reflect their specific purposes:**
  - **Order Lead Time: The time required to order or receive products from suppliers.**
  - **Material Lead Time: The time required to obtain products or materials from a particular supplier.**

And these are the steps in power query

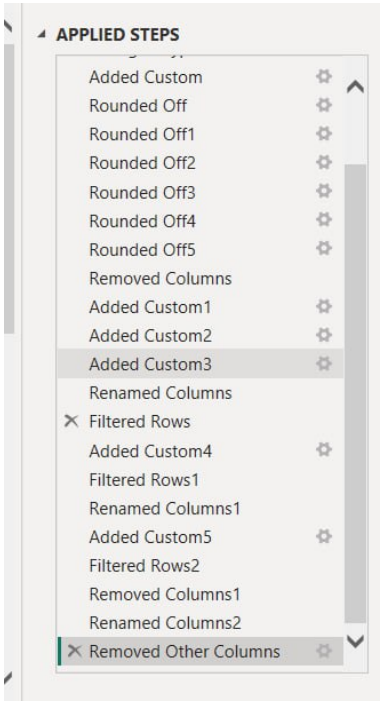


3. Data Modeling

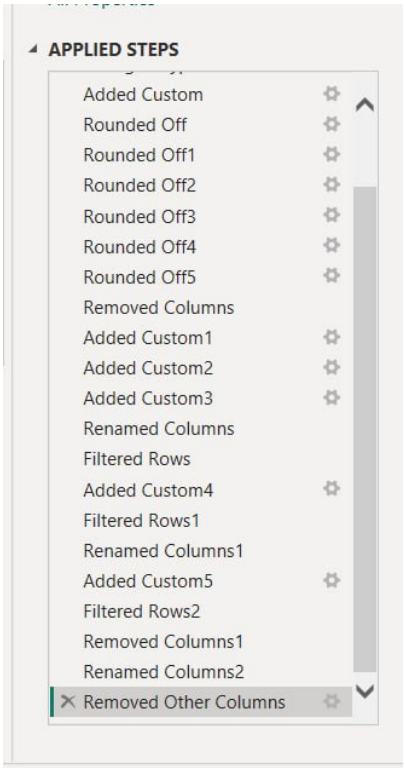
Tables Overview:

1. **Products Table**
    - **Key Columns**: SKU, Product Type, Price, Stock Levels, Availability
    - **Purpose**: Contains essential product details and inventory status.
2. **Suppliers Table**
    - **Key Columns**: Supplier Name, Location, Transfer Lead Time, Manufacturing Lead Time, Manufacturing Costs
    - **Purpose**: Stores supplier data along with manufacturing attributes.
3. **Shipping Table**
    - **Key Columns**: Shipping Carriers, Transportation Modes, Routes, Shipping Times, Shipping Costs
    - **Purpose**: Focuses on shipping operations and logistics metrics.
4. **Shipping_Lookup Table**
    - **Key Columns**: Mode ID, Transportation Modes
    - **Purpose**: Acts as a reference table to normalize transportation modes and link with the Shipping table.
5. **Fact Table – SupplyChainFacts**
    - **Key Columns**: SKU, Supplier Name, Shipping Carrier, Customer Demographics, Inspection Results, Products Sold, Revenue, Order Lead Time, Quantities, Production Volumes, Defect Rates, Costs
    - **Purpose**: Serves as the central fact table, capturing measurable supply chain metrics and connecting all dimensions.

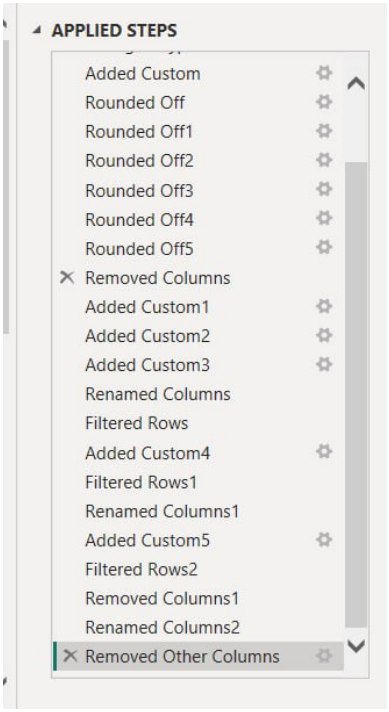
Products table



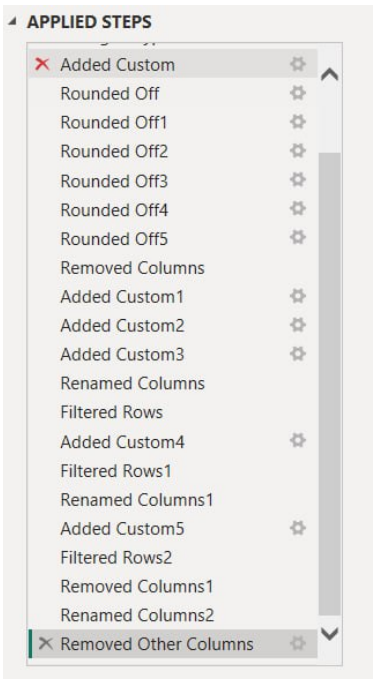
Suppliers table



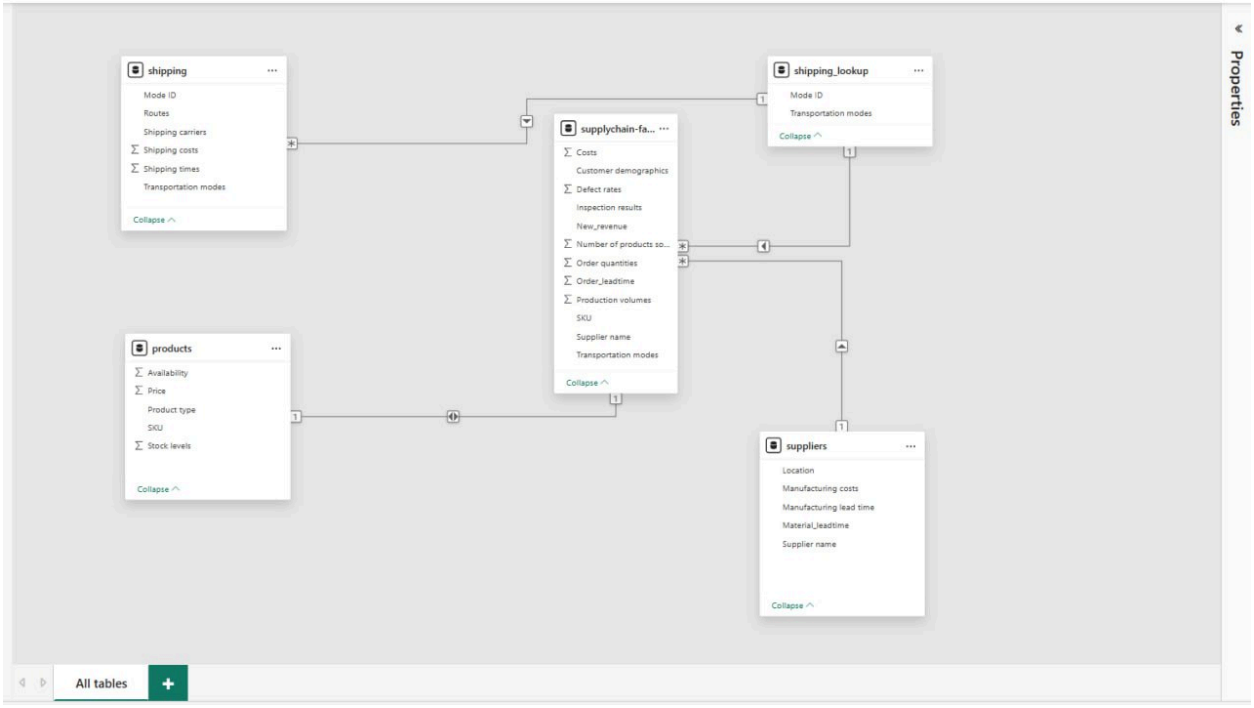
Shipping table



SupplyChainFacts table



Modeling


shipping
Mode ID
Routes
Shipping carriers
Shipping costs
Shipping times
Transportation modes
Collapse
shipping_lookup
Mode ID
Transportation modes
Collapse
supplychain-fa...
Costs
Customer demographics
Defect rates
Inspection results
New_revenue
Number of products so...
Order quantities
Order_leadtime
Production volumes
SKU
Supplier name
Transportation modes
Collapse
products
Availability
Price
Product type
SKU
Stock levels
Collapse
suppliers
Location
Manufacturing costs
Manufacturing lead time
Material_leadtime
Supplier name
Collapse
Properties
All tables