



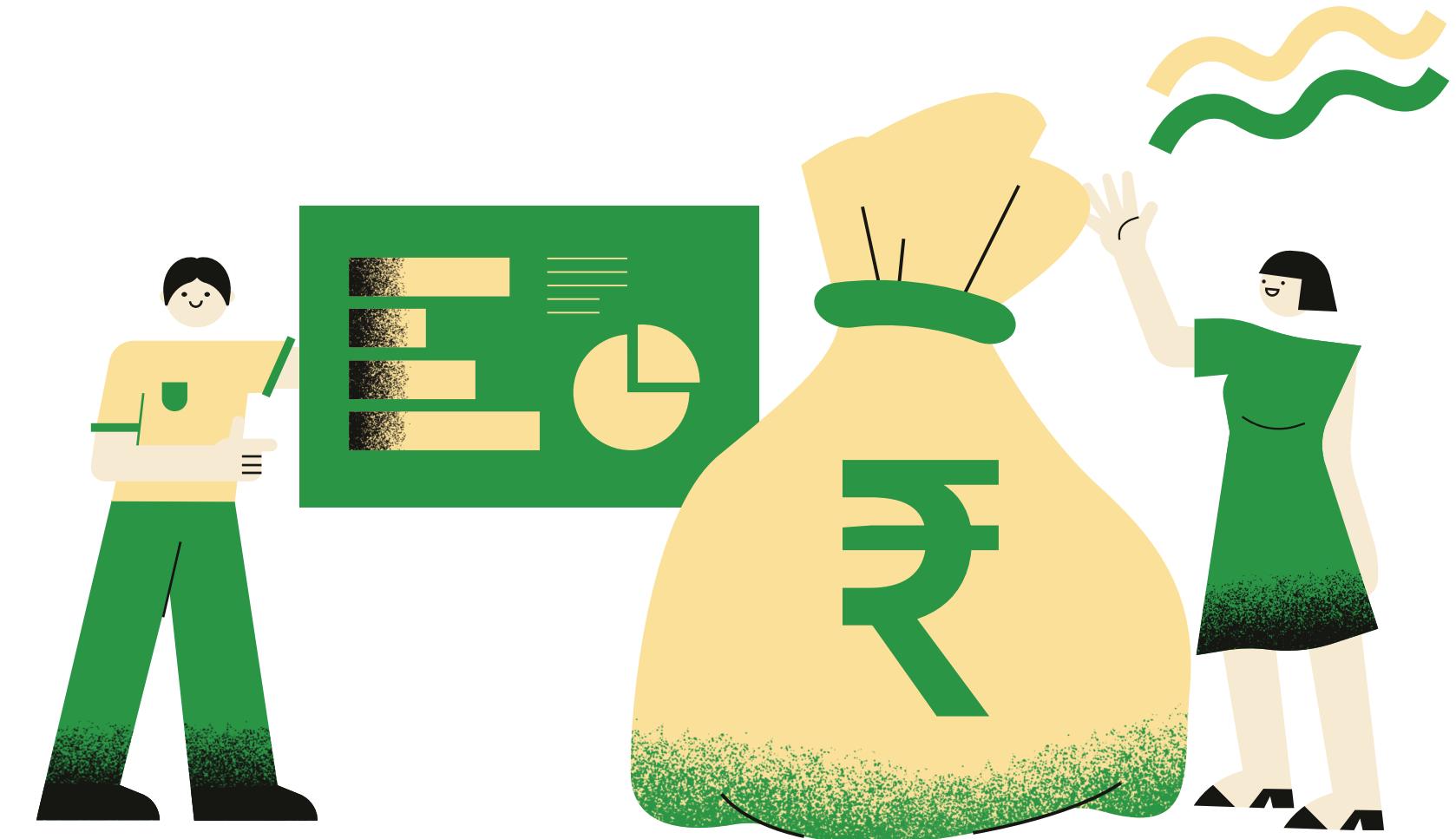
# Supply ~ Chain Data



More Information : [https://github.com/ZyadZ0z/Supply\\_chain\\_proj](https://github.com/ZyadZ0z/Supply_chain_proj)

# ... Introduction ...

- **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.

# ⋮ Feature explanation ⋮

- **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

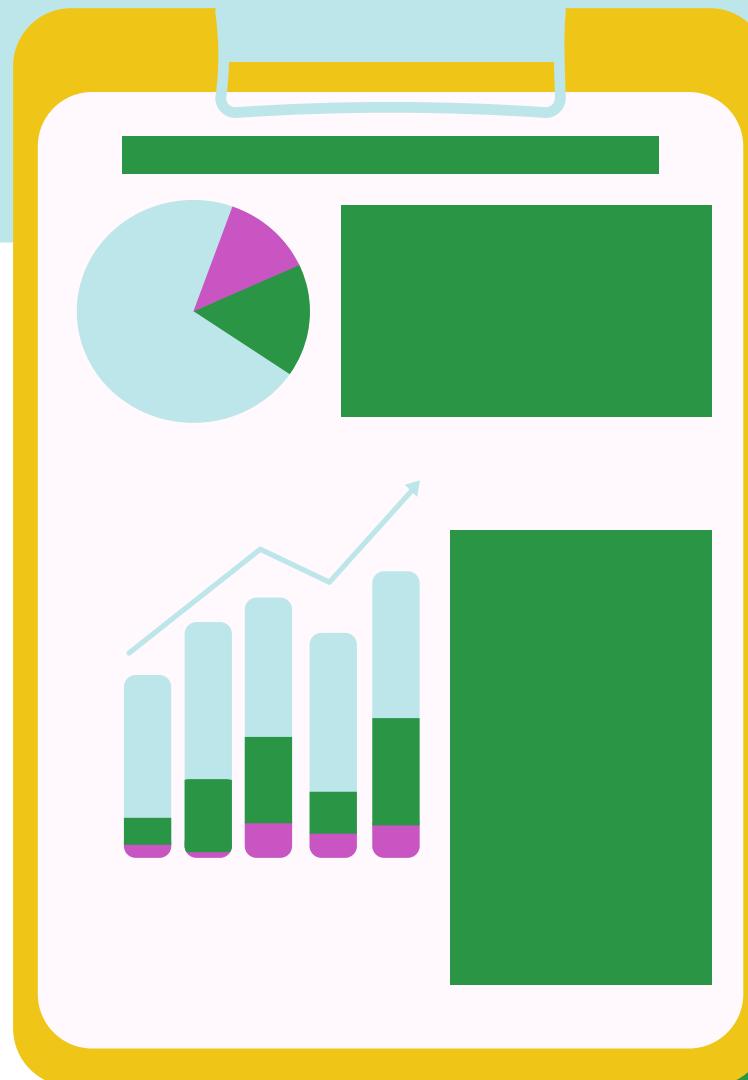


# Data Cleaning & Corrections

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



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





# ~~~~ Data Cleaning & Corrections ~~~~

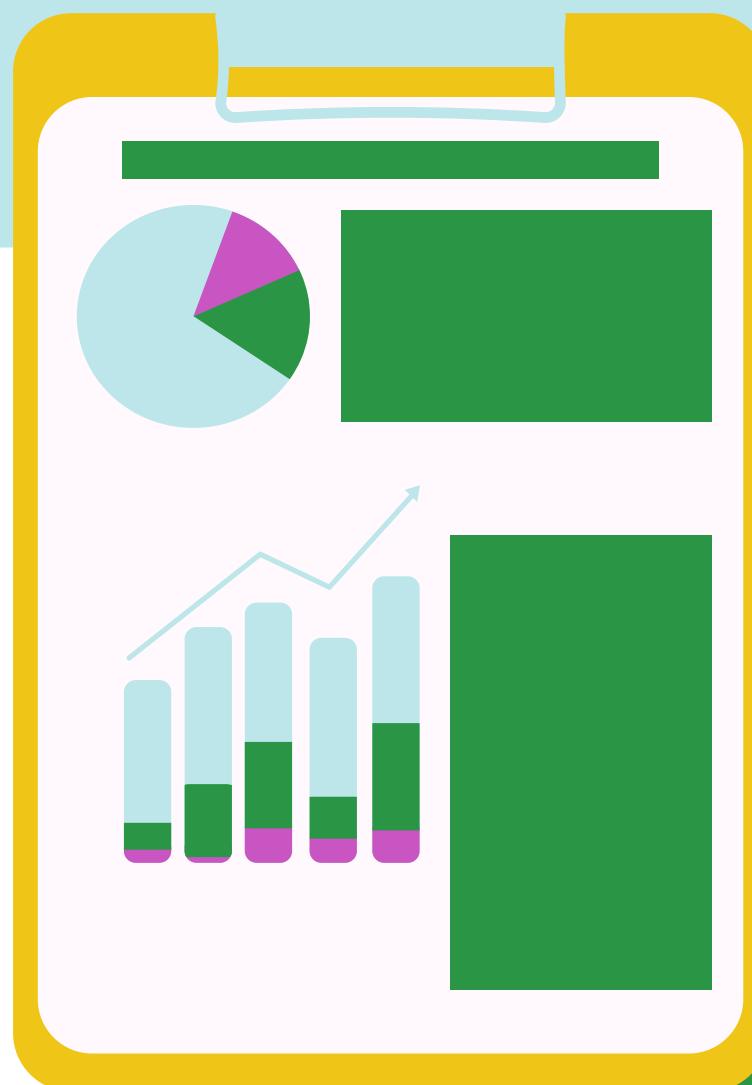
All data points were accurate and well-structured, with no major issues found — except one:

## Incorrect Revenue Calculation

The revenue was initially calculated incorrectly.

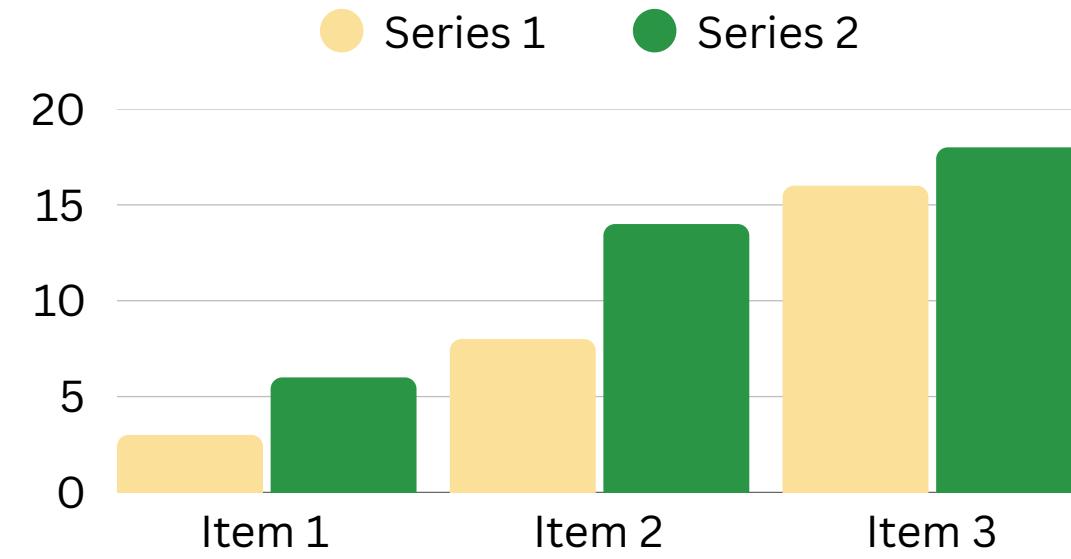
After review, we corrected the formula to:

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 :

#### APPLIED STEPS

Changed Type	▲
Added Custom	⚙
Rounded Off	⚙
Rounded Off1	⚙
Rounded Off2	⚙
Rounded Off3	⚙
Rounded Off4	⚙
Rounded Off5	⚙
Removed Columns	
Added Custom1	⚙
Added Custom2	⚙
Added Custom3	⚙
Renamed Columns	
Filtered Rows	
Added Custom4	⚙
Filtered Rows1	
Renamed Columns1	
Added Custom5	⚙
Filtered Rows2	
Removed Columns1	
✖ Renamed Columns2	▼

# Data Modeling

## Tables Overview:

### 1. Fact Table - chain\_facts

- Key Columns: Availability, Costs, Price, Customer demographics, Defect rates, Inspection results, location.1.Location ID, Manufacturing costs , Manufacturing lead time, Material\_leadtime, New\_revenue, Number of products sold, Order quantities, Order\_leadtime , Price, Production volumes, Shipping costs, Shipping times, shipping.Mode ID, SKU, Stock levels, suppliers.Supplier ID.

Purpose: This is the central fact table that contains the core transactional and performance data across the supply chain process. It connects to all the dimension tables and stores quantitative metrics such as sales volume, cost, revenue, defect rates, and timing data to support deep analysis and reporting.

chain_facts
Σ Availability
Σ Costs
Customer demographics
Σ Defect rates
Inspection results
location.1.Location ID
Σ Manufacturing costs
Σ Manufacturing lead time
Σ Material_leadtime
Σ New_revenue
Σ Number of products sold
Σ Order quantities
Σ Order_leadtime
Σ Price
Σ Production volumes
Σ Shipping costs
Σ Shipping times
shipping.Mode ID
SKU
Σ Stock levels
Σ suppliers.Supplier ID

# Data Modeling

## Tables Overview:

### 2.Dim\_location

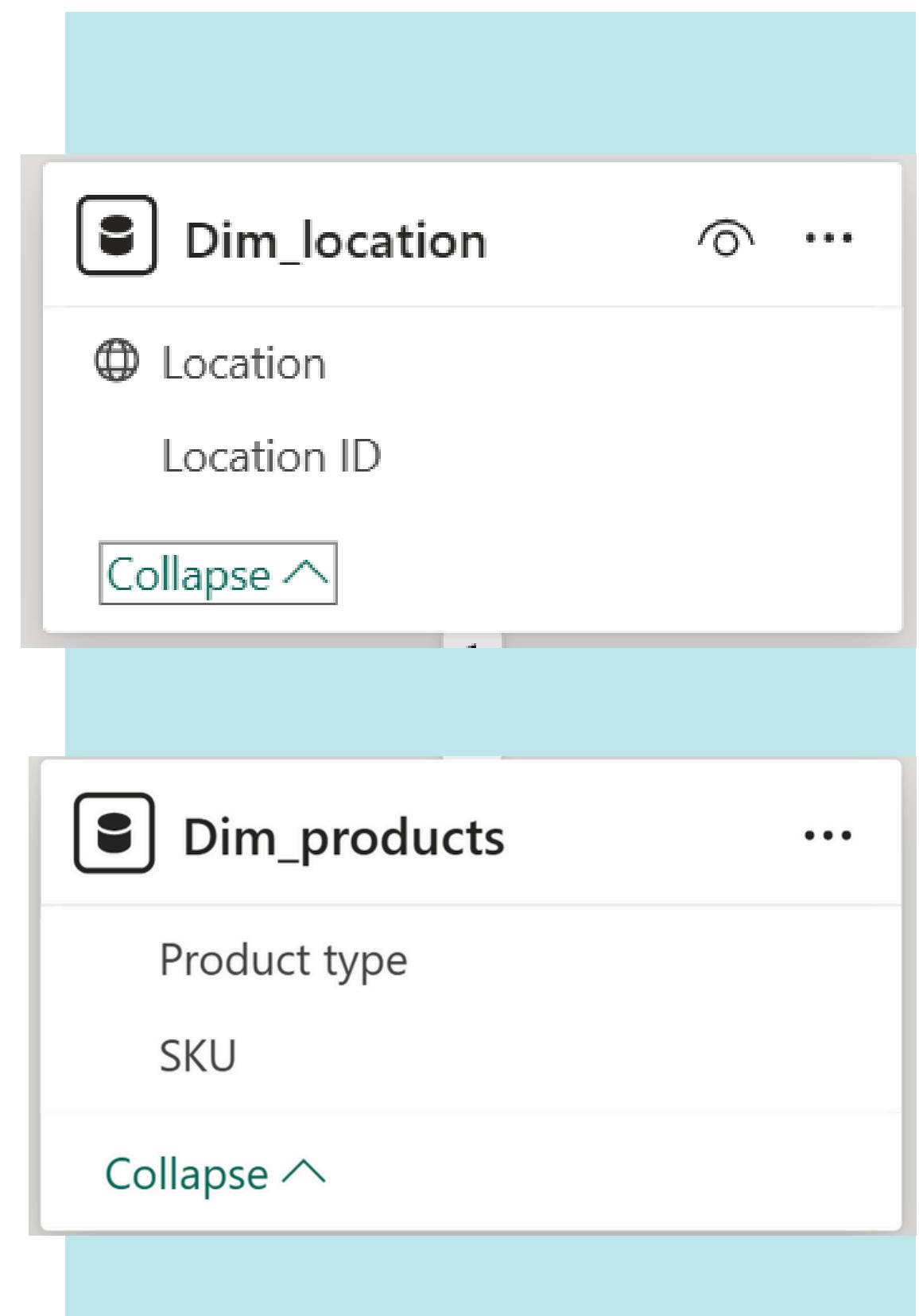
**Key Columns:** Location, Location ID.

**Purpose:** Provides geographic reference information for the data. It links each record in the fact table to a specific location (e.g., warehouse, distribution center, or customer region), allowing analysis by geography and logistics zones.

### 3.Dim\_products

**Key Columns:** Product type, SKU.

**Purpose:** Stores product-related attributes and categorization details, such as SKU codes and product types. It supports segmentation and comparison of metrics across different product categories.



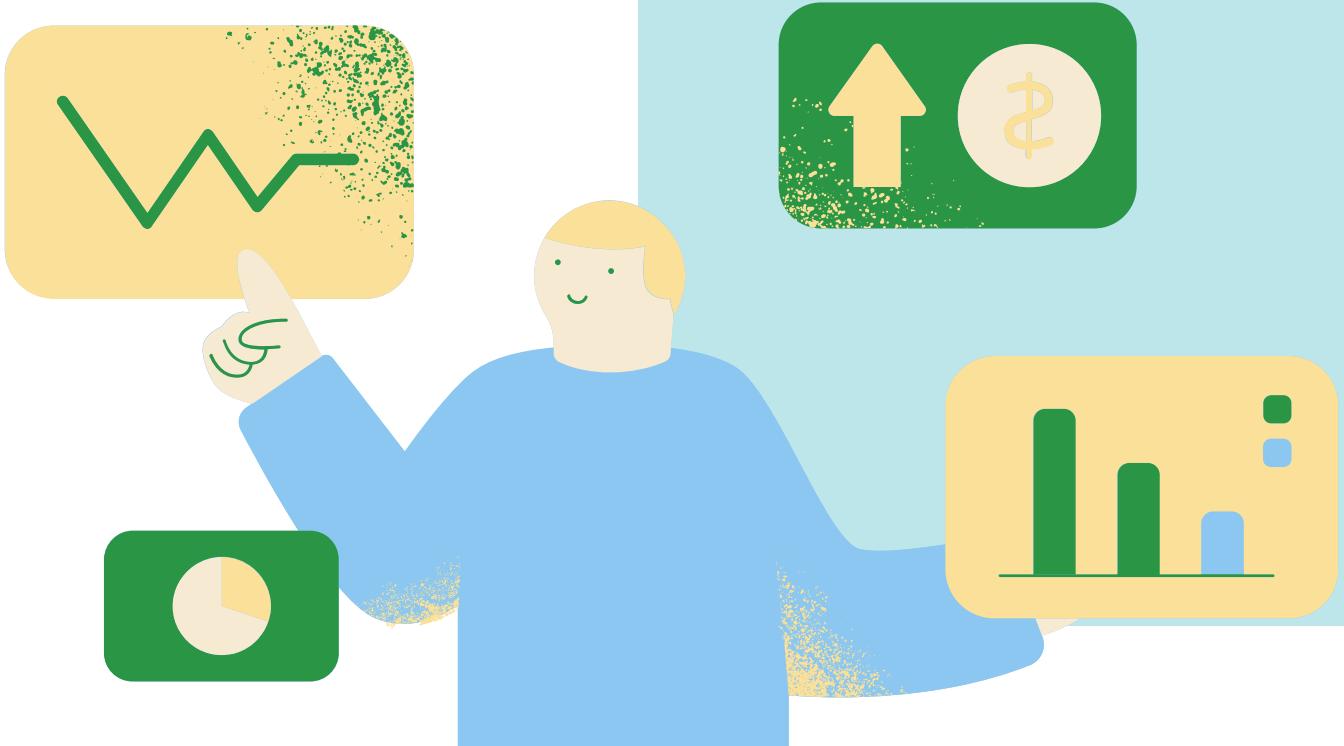
# Data Modeling

## Tables Overview:

### 4.Dim\_shipping

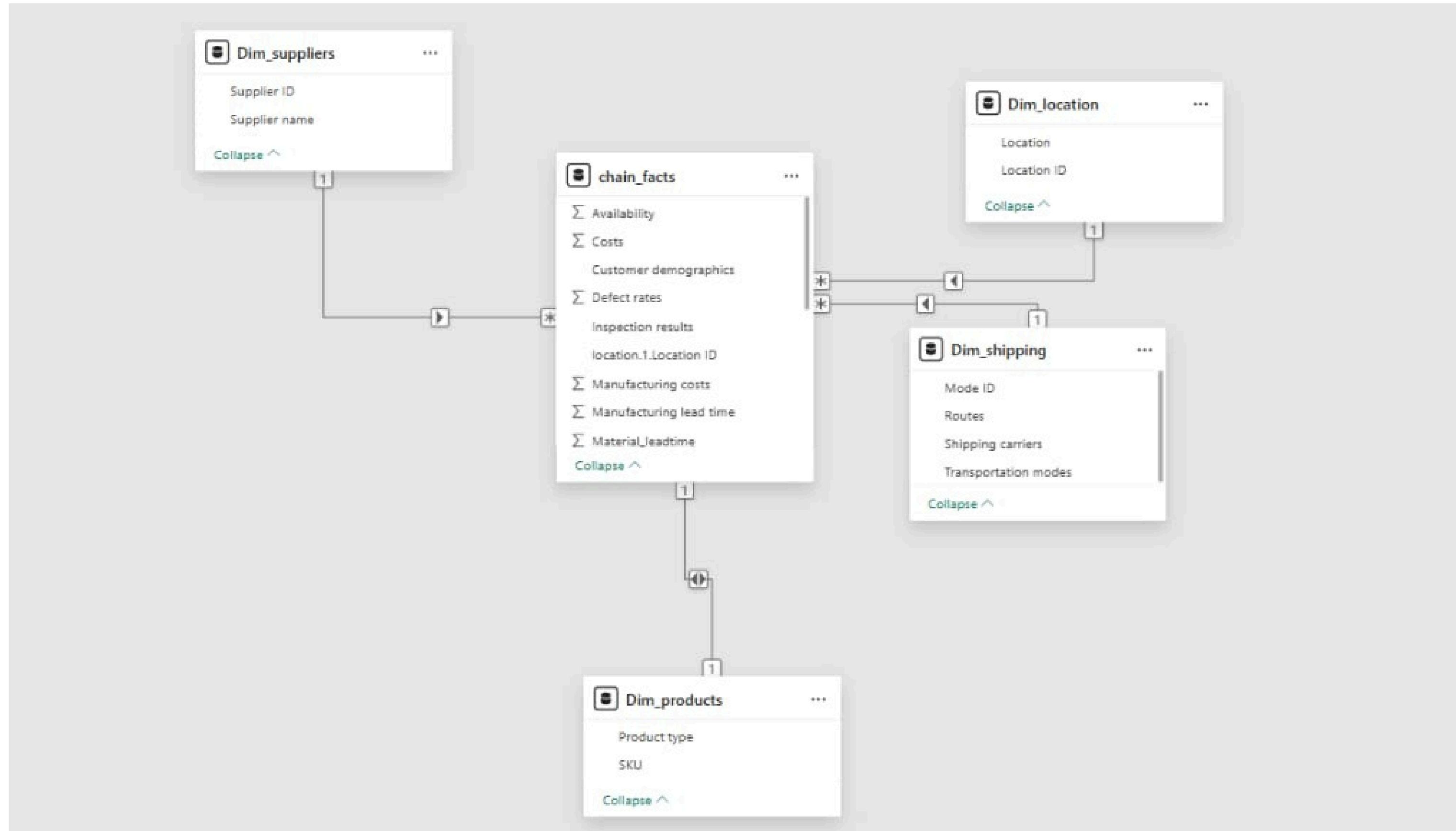
**Key Columns:** Mode ID, Routes, Shipping carriers, Transportation modes.

**Purpose:** Contains information related to shipping and logistics operations, including available routes, transportation types (air, land, sea), and shipping service providers. This enables detailed shipping performance and cost analysis.



Dim_shipping	...
Mode ID	
Routes	
Shipping carriers	
Transportation modes	
<a href="#">Collapse ^</a>	

# Data Modeling



# Analysis Questions

1. What is the total number of products sold?

Dax :  
**Total Products Sold =**  
**SUM(chain\_facts[Number of products sold])**

Explanation:  
Calculates the total number of units sold across all products during the analyzed period.

2. What is the total revenue generated?

Dax :  
**Total Revenue =**  
**SUM(chain\_facts[New\_revenue])**

Explanation:  
Sums up all the revenue generated from product sales.

3. What are the total costs incurred?

Dax :  
**Total Cost =**  
**SUM(chain\_facts[Costs])**

Explanation:  
Calculates the total supply chain costs, including manufacturing, shipping, and operational expenses.

4. What is the average material lead time?

Dax :  
**Material Lead Time Average =**  
**AVERAGE(chain\_facts[Material\_leadtime])**

Explanation:  
Gives the average time taken to receive raw materials from suppliers.

# Analysis Questions

5. What is the average manufacturing lead time?

Dax :  
Manufacturing Lead Time Average =  
 $\text{AVERAGE}(\text{chain\_facts}[\text{Manufacturing lead time}])$

Explanation:  
Represents the average time it takes to complete the manufacturing process.

6. What is the average order lead time?

Dax :  
Order Lead Time Average =  
 $\text{AVERAGE}(\text{chain\_facts}[\text{Order_leadtime}])$

Explanation:  
Measures how long it takes for an order to be received after it is placed.

7. What is the total production volume?

Dax :  
Total Production =  
 $\text{SUM}(\text{chain\_facts}[\text{Production volumes}])$

Explanation:  
Calculates the total number of products manufactured.

8. What is the average shipping time?

Dax :  
Shipping Times Average =  
 $\text{AVERAGE}(\text{chain\_facts}[\text{Shipping times}])$

Explanation:  
Shows the average delivery time from warehouse to customer.

# Analysis Questions

9. What is the average defect rate?

Dax :  
**Defect Rate Avg =**  
**AVERAGE(chain\_facts[Defect rates])**

Explanation:  
Indicates the average rate of defects found in manufactured products.

10. What is the total manufacturing cost?

Dax :  
**Manufacturing Costs Total =**  
**SUM(chain\_facts[Manufacturing costs])**

Explanation:  
Summarizes the total cost incurred in manufacturing all products.

11. What is the average stock level?

Dax :  
**Average Stock Level =**  
**AVERAGE(chain\_facts[Stock levels])**

Explanation:  
Gives an overview of how much stock is typically available across all products.

12. What is the average availability across products?

Dax :  
**Avg Availability =**  
**AVERAGE(chain\_facts[Availability])**

Explanation:  
Measures how frequently products are available for sale or distribution.

# Analysis Questions

13. What is the total availability?

Dax :  
Total Availability =  
`SUM(chain_facts[Availability])`

Explanation:  
Sums the availability scores to identify overall product presence.

14. What is the average order quantity?

Dax :  
Order Quantities Avg =  
`AVERAGE(chain_facts[Order quantities])`

Explanation:  
Calculates the average number of products per order.

15. What is the stock level by product category? (Haircare, Skincare, Cosmetics)

Dax :  
Average Stock for Haircare:  
`Avg Stock Hair Care =  
CALCULATE(  
AVERAGE(chain_facts[Stock  
levels]),  
Dim_Products[Product Type] =  
"haircare"  
)`

Average Stock for Skincare:  
`Avg Stock Skin Care =  
CALCULATE(  
AVERAGE(chain_facts[Stock  
levels]),  
Dim_Products[Product Type] =  
"skincare"  
)`

Average Stock for Cosmetics:  
`Average Stock Cosmetics =  
CALCULATE(  
AVERAGE(chain_facts[Stock  
levels]),  
Dim_Products[Product Type] =  
"cosmetics"  
)`

Explanation:  
These measures provide insight into average stock per category, helping to compare inventory levels.

# Analysis Questions

16. What is the total stock per product category?

Dax :

Cosmetics:  
Total Stock Cosmetics =  
CALCULATE(  
SUM(chain\_facts[Stock levels]),  
Dim\_Products[Product Type] =  
"cosmetics"  
)

Haircare:

Total Stock Haircare =  
CALCULATE(  
SUM(chain\_facts[Stock levels]),  
Dim\_Products[Product Type] =  
"haircare"  
)

Skincare:

Total Stock Skincare =  
CALCULATE(  
SUM(chain\_facts[Stock levels]),  
Dim\_Products[Product Type] =  
"skincare"  
)

Explanation:

Summarizes total inventory per category  
to help identify which type has the most  
stock on hand.

# Analysis Questions

17. How are products categorized by price range?

18. Which products are low in stock?

19. What is the profit margin?

Dax :  
**Stock Alert** =  
IF(chain\_facts[Stock levels] <= 10, "Low stock", "Available")

Explanation:  
Highlights which products may soon run out of stock and need restocking.

Dax :  
**Profit Margin** =  
DIVIDE([Total revenue] - [Total cost], [Total revenue], 0)

Explanation:  
Calculates how much profit is earned per unit of revenue, showing business profitability.

Dax :  
**Price Range** =  
SWITCH(  
TRUE(),  
chain\_facts[Price] <= 20,  
"Low",  
chain\_facts[Price] <= 60,  
"Medium",  
chain\_facts[Price] <= 100,  
"High",  
"Unknown"  
)

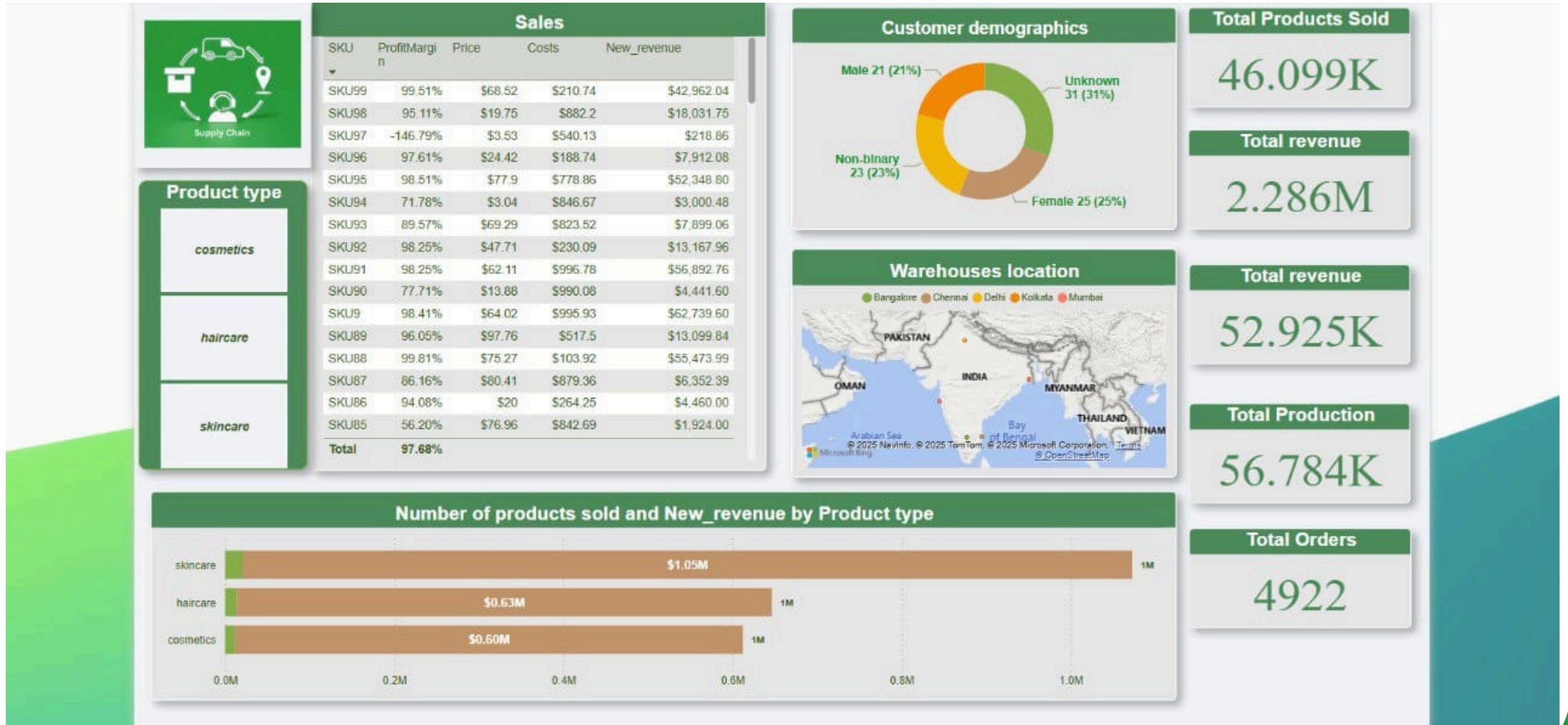
Explanation:  
Categorizes products into low, medium, or high price groups for comparison with sales and revenue.

# Dashboard

**Supply  
Chain  
Optimization**



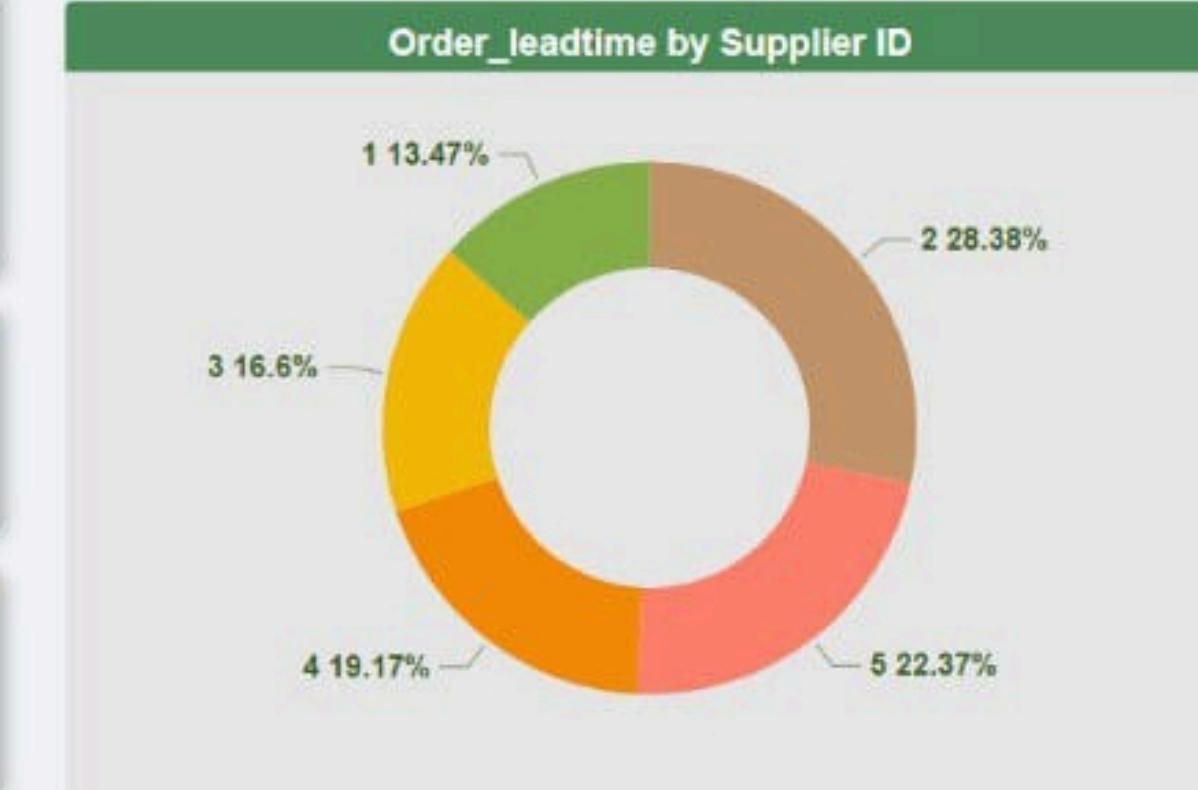
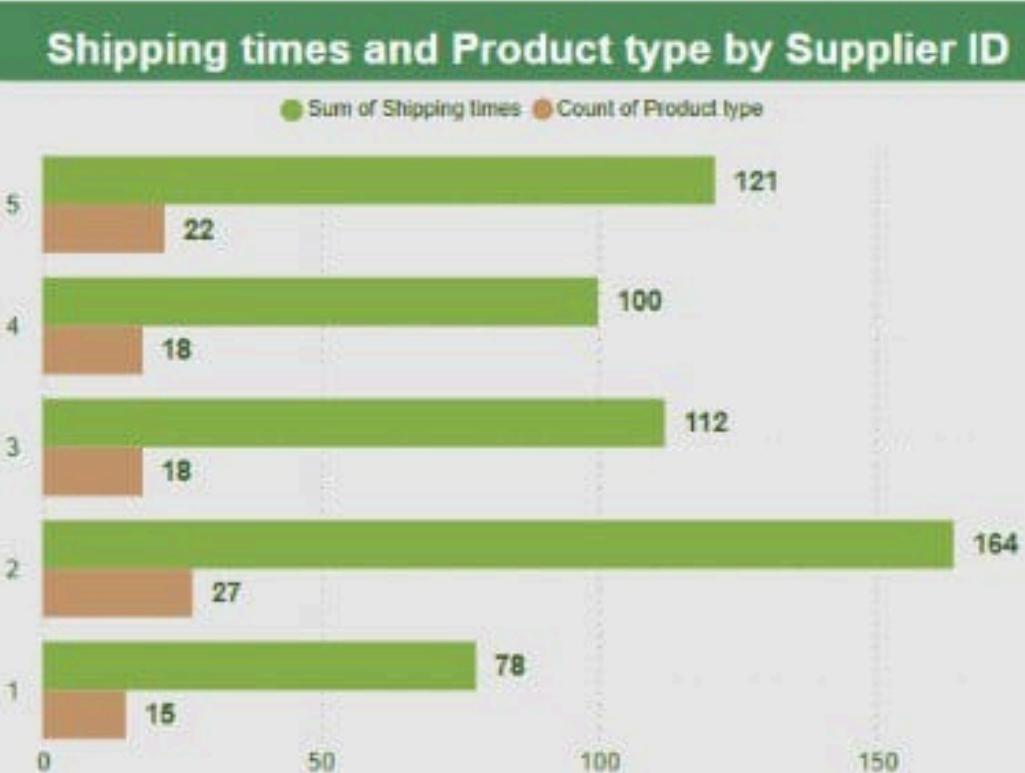
# Dashboard



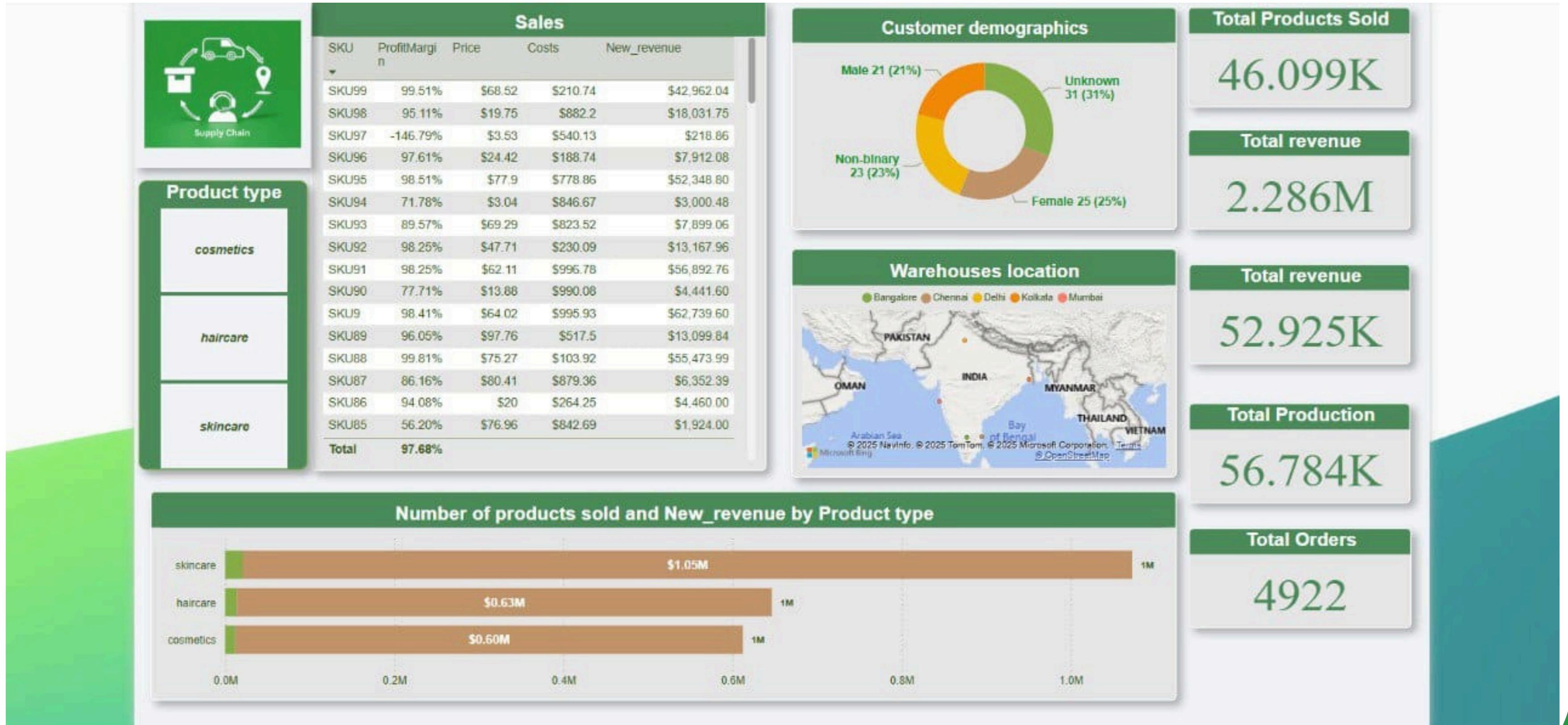
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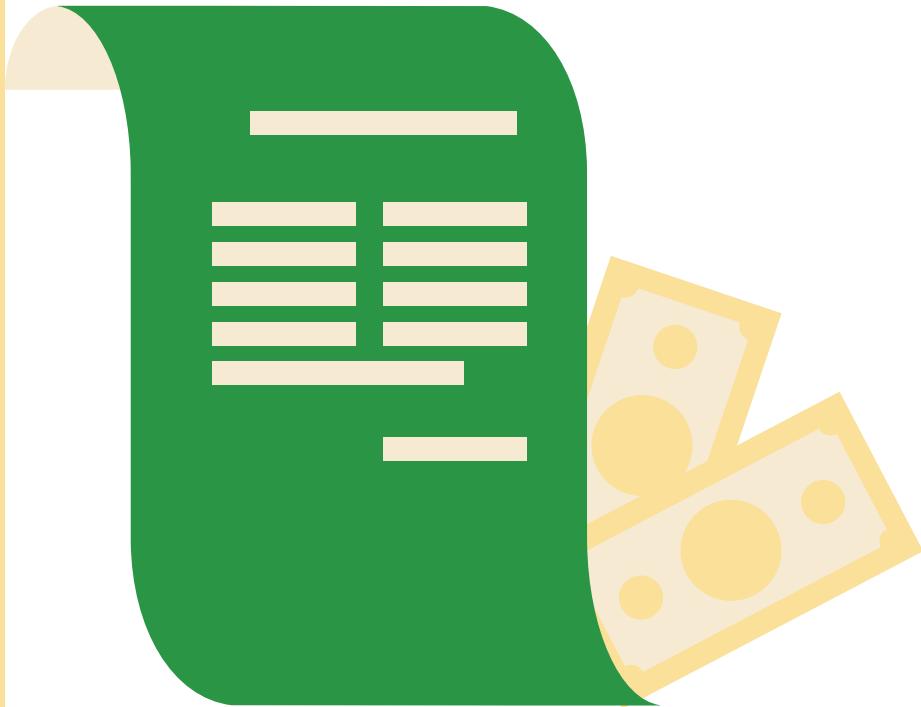
# Dashboard



# Dashboard



# Team



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**Thank You**

