SUPPLY CHAIN MANAGEMENT DASHBOARD

UN MENTOR INTERNSHIP PROJECT REPORT

Introduction to Supply Chain Management

Supply Chain Management (SCM) refers to the coordination, management, and optimization of activities involved in the flow of goods, services, information, and finances across the entire supply chain—from raw material suppliers to the end consumer. It aims to ensure the efficient delivery of products while minimizing costs and maximizing customer satisfaction.

A supply chain encompasses multiple stages, including procurement, production, warehousing, transportation, and distribution. SCM integrates these stages to streamline operations, reduce bottlenecks, and respond effectively to market demands. It involves collaboration among suppliers, manufacturers, distributors, retailers, and customers. It seems like you have a dataset containing various details about products, including their prices, availability, customer demographics, shipping data, supplier information, and other associated attributes.

If you need help analysing or processing this data (for instance, summarizing key trends, creating reports, or performing data analysis), let me know how you'd like to proceed! Here are a few potential ways to process it:

1. **Summary Analysis**: Calculate total revenue, average prices, number of units sold, or identify high-performing products.
2. **Segmentation**: Group by product type, supplier, or customer demographics and analyse patterns in the data.
3. **Shipping Insights**: Analyse shipping times, costs, and shipping carrier performance.
4. **Defect Rates & Quality Control**: Investigate defect rates across different products, routes, or suppliers.
5. **Trends & Forecasting**: Use the historical data to predict future demand or sales.

Explanation of Each Part:

- **Product Performance Dashboard**:
    - **Product Sales**: We use countplot from seaborn to count the number of products sold by product type.
    - **Revenue Analysis**: We use groupby to sum the revenue per product type, and then plot this over time using a line plot.
    - **Price Distribution**: A histplot visualizes the distribution of product prices, with the option to add a KDE (Kernel Density Estimate) curve for better visualization.

    - **Stock Levels**: A heatmap provides a color-coded overview of stock levels per SKU and product type.

- **Supply Chain Efficiency Dashboard**:
    - **Lead Times vs. Order Quantities**: A scatterplot is used to show the relationship between order quantities and lead times, with the hue parameter distinguishing between suppliers.
    - **Shipping Costs by Carrier**: We use groupby to aggregate the shipping costs by carrier and display them using a bar chart.
    - **Manufacturing Efficiency**: A dual-axis chart is created using matplotlib to show both manufacturing lead time and production volume.
    - **Defect Rates**: A pie chart is used to show the defect rates by supplier.
- **Customer Demographics Dashboard**:
    - **Demographic Breakdown**: A stacked bar chart visualizes the breakdown of customers by age group and gender.
    - **Revenue by Demographics**: A treemap is created using squarify to show how revenue is distributed across demographic groups.

Creating these visualizations in **Excel** involves importing the data into Excel, using built-in charting tools, and applying formatting for a clear and professional look. Here's a step-by-step guide to creating the visualizations described in your dashboards:

1. Product Performance Dashboard

Product Sales: Bar Chart (Number of Products Sold by Product Type)

1. **Data Preparation**: Create a table with columns like Product Type, Product, and Quantity Sold.
2. **Insert Bar Chart**:
    - Select your data (Product Type vs Quantity Sold).
    - Go to the **Insert** tab → **Bar Chart** → Choose a **Clustered Bar Chart**.
    - Customize the chart title and axis labels for clarity.

Revenue Analysis: Line Chart (Revenue over Time by Product Type)

1. **Data Preparation**: Create a table with Date, Product Type, and Revenue.
    - Make sure to format the Date column as a date.
2. **Insert Line Chart**:
    - Select your data (Date, Product Type, and Revenue).

- Go to the **Insert** tab → **Line Chart** → Choose a **Line with Markers**.
- Format the chart by adding a title and adjusting the axis labels.

Price Distribution: Histogram (Price Distribution by Product Type)

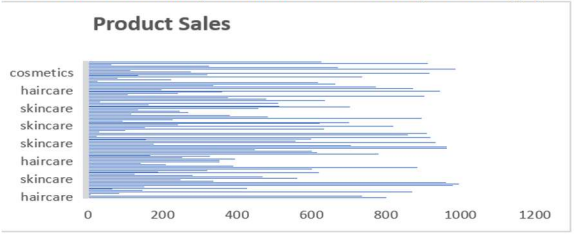
1. **Data Preparation**: Create a table with Price and Product Type.
2. **Insert Histogram**:
   - Select the Price data.
   - Go to the **Insert** tab → **Insert Statistic Chart** → Choose **Histogram**.
   - Adjust the bin settings (number of bins) if necessary to refine the distribution.
   - Add the Product Type as a filter in the chart for better segmentation.

Stock Levels: Heat Map (Stock Levels by SKU and Product Type)

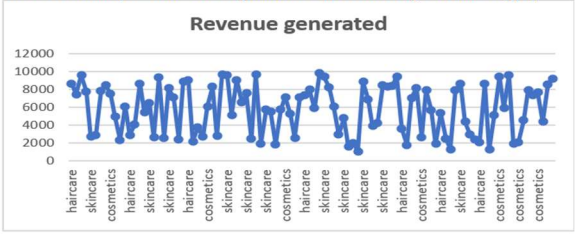
1. **Data Preparation**: Create a table with Product Type, SKU, and Stock Level.
2. **Insert Conditional Formatting**:
   - Select the Stock Level data.
   - Go to **Home** → **Conditional Formatting** → Choose **Color Scales** (this will apply a heatmap color scale to the values).
   - Customize the color scale to your preference.

Product Performance Dashboard

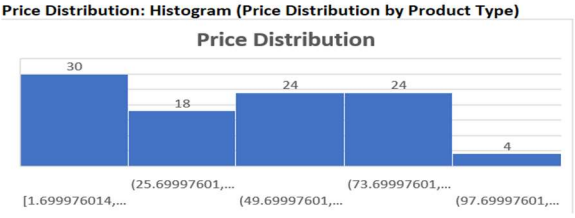
Product Sales: Bar Chart (Number of Products Sold by Product Type)



Revenue Analysis: Line Chart (Revenue over Time by Product Type)



Price Distribution: Histogram (Price Distribution by Product Type)



Stock Levels: Heat Map (Stock Levels by SKU and Product Type)

Product type	SKU	Stock levels
haircare	SKU0	58
skincare	SKU1	53
haircare	SKU2	1
skincare	SKU3	23
skincare	SKU4	5
haircare	SKU5	90
skincare	SKU6	11
cosmetics	SKU7	93
cosmetics	SKU8	5

Conclusion for Product Performance Dashboard

The **Product Performance Dashboard** offers valuable insights into various aspects of product sales and inventory management.

- **Sales Analysis** helps identify which product types are performing best, allowing businesses to focus on high-demand products, optimize inventory, and adjust marketing strategies accordingly.

- **Revenue Trends** highlight fluctuations over time, helping to pinpoint the effects of seasonal demand, promotions, or potential issues, which can guide strategic decisions around pricing, promotions, and product offerings.
- **Price Distribution** provides insight into how products are priced, revealing customer price sensitivity and offering opportunities for price adjustments or targeted discounts.
- **Stock Levels** highlight inventory status, enabling businesses to avoid stockouts or overstocking, optimize restocking efforts, and ensure high-demand items are always available.

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2. Supply Chain Efficiency Dashboard

Lead Times vs Order Quantities: Scatter Plot

1. **Data Preparation**: Create a table with Lead Time, Order Quantity, and Supplier.
2. **Insert Scatter Plot**:
    - Select your data (Lead Time vs Order Quantity).
    - Go to the **Insert** tab → **Scatter Chart** → Choose a basic **Scatter Plot**.
    - Format the chart by adding labels, title, and coloring points based on the Supplier using the **Legend**.

Shipping Costs by Carrier: Bar Chart

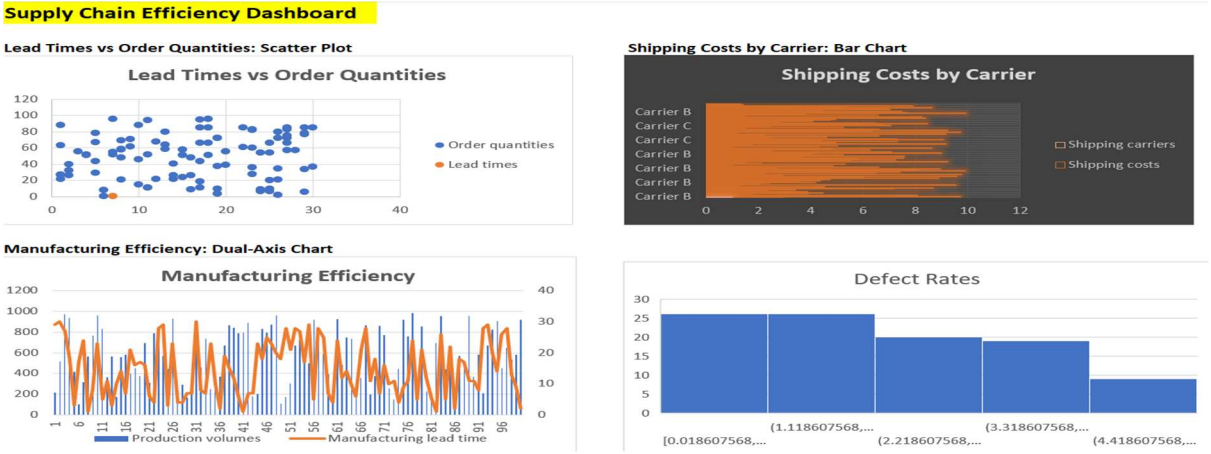
1. **Data Preparation**: Create a table with Shipping Carrier and Shipping Cost.
2. **Insert Bar Chart**:
    - Select your data (Shipping Carrier vs Shipping Cost).
    - Go to the **Insert** tab → **Bar Chart** → Choose a **Clustered Bar Chart**.
    - Add labels, title, and adjust the chart's axis as needed.

Manufacturing Efficiency: Dual-Axis Chart

1. **Data Preparation**: Create a table with Manufacturing Lead Time and Production Volume.
2. **Insert Dual-Axis Chart**:
    - Select the data (Manufacturing Lead Time and Production Volume).
    - Go to the **Insert** tab → **Combo Chart** → Choose **Custom Combination Chart**.
    - Select one data series to be shown as a **Line** and the other as **Column**. Assign a secondary axis to one series.
    - Adjust axis titles and the chart title.

Defect Rates: BAR Chart

1. **Data Preparation**: Create a table with Supplier and Defect Rate.
2. **Insert BAR Chart**:
    - Select your data (Supplier vs Defect Rate).
    - Go to the **Insert** tab → **BAR Chart** → Choose **2-D Pie**.
    - Format the chart by adding percentages and adjusting the labels.



Conclusion The Supply Chain Efficiency:

The Supply Chain Efficiency Dashboard provides valuable insights into various aspects of the supply chain, including lead times, shipping costs, manufacturing efficiency, and product defects. By analyzing these visualizations:

- **Lead times and order quantities: Understanding this relationship allows businesses to optimize production and procurement processes, ensuring timely order fulfillment and improved customer satisfaction.**
- **Shipping costs by carrier: Analyzing shipping costs helps identify more cost-effective carriers and optimize logistics, reducing expenses and improving profitability.**
- **Manufacturing efficiency: Monitoring production volumes and lead times enables businesses to scale efficiently, streamline manufacturing processes, and minimize bottlenecks.**
- **Defect rates by supplier: Tracking defect rates allows for better quality control and supplier management, which is crucial for maintaining product quality and customer satisfaction.**

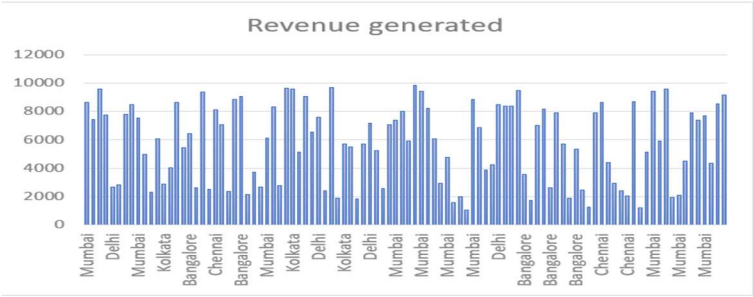
3. Customer Demographics Dashboard

Demographic Breakdown: Stacked Bar Chart

1. **Data Preparation**: Create a table with Age Group and Gender.
    - You can use **Pivot Table** to aggregate the data by Age Group and Gender.

2. **Insert Stacked Bar Chart**:
    - Select the aggregated data (Age Group vs Gender).
    - Go to the **Insert** tab → **Bar Chart** → Choose **100% Stacked Bar**.
    - Add a title and axis labels.

Customer Demographics Dashboard



Conclusion Customer Demographics Dashboard

The stacked bar chart visualizes the demographic breakdown of customers by age group and gender. Each bar represents a different age group, with segments showing gender distribution.This visualization provides insights into which demographics are the largest customer segments. A more balanced or skewed gender distribution can guide targeted marketing strategies or product development. If certain age groups are more prominent, it could indicate areas to strengthen brand engagement.

Final Conclusion:

The dashboards presented offer a comprehensive view of the performance of products, the efficiency of the supply chain, and customer demographics. By analysing the various visualizations, businesses can:

- **Identify high-performing products** and make data-driven decisions about pricing, stock management, and production scheduling.
- **Optimize the supply chain** by identifying inefficiencies, reducing costs (e.g., in shipping or manufacturing), and improving supplier management.
- **Target the right customer segments** by understanding demographic influences on sales and customer behaviour.

Each dashboard and visualization provide's a different perspective on the supply chain and sales process, enabling companies to optimize operations, reduce costs, and increase profitability while enhancing customer satisfaction.