Supply Chain Management Dashboard – Enhanced Report

Unified Mentor Internship | Data Analyst Role

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1. Executive Summary

As part of my one-month Data Analyst internship at Unified Mentor, I developed a comprehensive Supply Chain Management (SCM) Dashboard using Python and data visualization tools. This project aimed to uncover operational inefficiencies, monitor product performance, and generate actionable business insights by analysing real-world supply chain data.

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2. Introduction to Supply Chain Management (SCM)

Supply Chain Management encompasses the end-to-end coordination of resources, information, and finances as products move from suppliers to consumers. The key objectives of SCM are to:

- Enhance operational efficiency

- Minimize costs and delays

- Improve customer satisfaction

- Maintain optimal stock levels

The dataset included information on product SKUs, supplier profiles, customer demographics, shipping metrics, prices, and defect rates—offering a complete view of the supply chain lifecycle.

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3. Project Objectives

The analysis was structured around the following objectives:

- **Revenue and Performance Metrics**
  Analyse sales volume, revenue trends, and pricing insights.

- **Customer Segmentation**
  Identify behavioural patterns using demographic and product preference data.

- **Shipping and Delivery Analytics**
  Evaluate carrier performance and cost effectiveness.

- **Defect and Quality Analysis**
  Pinpoint sources of defects in the supply chain.

- **Trend and Forecast Analysis**
  Detect temporal patterns for future inventory and logistics planning.

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4. Dashboard Components and Key Insights

A. Product Performance Dashboard

- **Product Sales Overview:**
  Count plots highlighted category-wise sales volumes, identifying high-demand SKUs.

- **Revenue Trends:**
  Line graphs displayed revenue over time, revealing seasonal or promotional spikes.

- **Price Distribution:**
  Histograms showed product pricing clusters, aiding pricing strategy.

- **Stock Overview:**
  Heatmaps visualized inventory levels across SKUs, helping detect stockouts or overstocking.

B. Supply Chain Efficiency Dashboard

- **Lead Time vs Order Quantity:**
  Scatter plots revealed a positive correlation between order size and lead time for certain suppliers.

- **Shipping Cost by Carrier:**
  Bar charts identified the most cost-effective carriers, supporting logistics optimization.

- **Manufacturing Insights:**
  Dual-axis charts illustrated production volume vs. lead time, exposing bottlenecks in manufacturing.

- **Quality Check:**
  Pie charts categorized product defects by supplier, spotlighting quality control issues.

C. Customer Demographics Dashboard

- **Demographic Breakdown:**
  Stacked bar charts showed a balanced customer base across genders and age groups.

- **Revenue by Demographics:**
  Tree maps visualized revenue distribution across customer segments, informing targeted marketing strategies.

5. Tools and Technologies Used

- **Programming Language:** Python

- **Libraries:** Pandas, Matplotlib, Seaborn, Squarify

- **Visualization Tools:** Matplotlib, Seaborn (for charts, graphs, and heatmaps)

- **Dashboard Layout:** Jupyter Notebook for exploratory data analysis and dashboard creation

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6. Impact and Applications

This project showcased how data analytics can enhance visibility across the supply chain, support strategic decisions, and deliver measurable improvements in cost, speed, and service quality. It also emphasized the importance of integrating data from various touchpoints—procurement, logistics, customer service—for holistic analysis.

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7. Conclusion

Through this internship project, I demonstrated the ability to apply analytical tools to real-world supply chain challenges. The dashboards and visualizations I developed provided actionable insights for optimizing procurement, improving delivery times, segmenting customers more effectively, and identifying quality issues at the source.