**Supply Chain Efficiency:  
A Transportation & Logistics Dashboard**  
A Deep Analysis and Visualization using Tableau

Content

Abstract

1. Introduction
2. Dataset Overview
3. Proposed Visualizations
4. Expected Outcomes
5. Conclusion

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**Abstract**   
This project analyzes transportation and logistics data within a supply chain framework using Tableau. By examining key metrics such as shipping costs, lead times, defect rates, and customer demographics, we aim to uncover insights that can enhance supply chain efficiency, reduce operational costs, and improve overall performance. The proposed visualizations, including scatter plots, bar charts, heat maps, and histograms, will provide a comprehensive overview of how different factors impact logistics and transportation. These insights will support strategic decision-making in cost optimization, supplier management, and inventory control, ultimately contributing to a more robust and effective supply chain.

1. **Introduction**

The goal of this project is to analyze the transportation and logistics data of a supply chain system using Tableau. The dataset contains various aspects of product distribution, including product types, pricing, availability, shipping methods, transportation costs, and more. Our analysis aims to provide insights into optimizing logistics, reducing costs, and improving overall supply chain efficiency.

1. **Dataset Overview**

The dataset contains 100 entries with 24 columns, covering the following key aspects:

* Product Information: Product type, SKU, Price, Availability, and Number of products sold.
* Sales Metrics: Revenue generated, Customer demographics, Stock levels.
* Logistics and Shipping: Lead times, Order quantities, Shipping times, Shipping carriers, Shipping costs, Transportation modes, and Routes.
* Supplier and Manufacturing: Supplier name, Location, Lead time, Production volumes, Manufacturing lead time, Manufacturing costs, Inspection results, and Defect rates.

1. **Proposed Visualization**

To provide a comprehensive understanding of the transportation and logistics processes, we propose the following visualizations:

* Revenue vs. Shipping Costs Scatter Plot
* To analyze the relationship between revenue generated and shipping costs. This can help identify cost-effective shipping strategies.
* Plot Revenue generated on the Y-axis and Shipping costs on the X-axis. Different colors will represent different transportation modes.
* Shipping Times by Transportation Mode Bar Chart
* To evaluate the efficiency of various transportation modes (Road, Rail, Air).
* Use a bar chart where the X-axis represents transportation modes and the Y-axis represents average shipping times.
* Lead Time Distribution Histogram
* To understand the distribution of lead times across different suppliers and locations, which can aid in supply chain optimization.
* Create a histogram showing the frequency of different lead times.
* Defect Rates by Manufacturing Location Heatmap
* To identify which locations, have higher defect rates, allowing for targeted quality improvement efforts.
* Use a heatmap where rows represent manufacturing locations and columns represent defect rates.
* Product Availability vs. Number of Products Sold Line Chart
* To explore how product availability impacts sales, helping in inventory management.
* Plot a line chart with Availability on the X-axis and Number of products sold on the Y-axis, with different lines for different product types.
* Cost Distribution by Route Pie Chart
* To visualize the proportion of costs associated with different transportation routes.
* Create a pie chart showing the percentage of total costs for each route.
* Customer Demographics Segmentation Bar Chart
* To understand customer segmentation and target marketing efforts accordingly.
* Use a bar chart to display the number of customers across different demographics (e.g., Male, Female, Non-binary).
* Supplier Lead Time Comparison Box Plot
* To compare lead times across different suppliers to identify the most efficient ones.
* Create a box plot where each box represents a different supplier, with the lead time as the variable.

1. **Expected Outcomes**

* Cost Optimization:

By analyzing shipping costs and transportation modes, the company can identify cost-effective methods and routes, potentially reducing overall logistics costs.

* Inventory Management:

Understanding the relationship between availability and sales will help in better inventory planning and avoiding stockouts or overstocking.

* Supplier Performance:

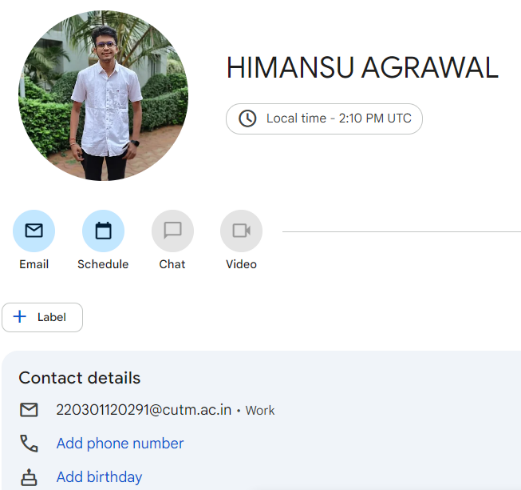
Analyzing lead times and defect rates by the supplier will highlight which suppliers are performing well and which require improvement.

* Customer Insights:

Segmenting customers based on demographics can provide insights into targeting specific customer groups more effectively.

1. **Conclusion**

This Tableau project will enable a data-driven approach to optimizing transportation and logistics within the supply chain. The visualizations will provide actionable insights into cost management, supplier performance, and customer segmentation, ultimately contributing to improved operational efficiency and profitability.



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