

Unlocking Supply Chain Efficiency

This report provides a diagnostic analysis of a company's supply chain using structured data. Our objective is to identify inefficiencies, understand root causes behind performance gaps, and offer actionable recommendations through SQL-based analysis and Power BI visualizations.

Strategic Objectives of Our Analysis



Product Performance

Identify high-performing and underperforming products.



Supplier Evaluation

Assess supplier efficiency and quality reliability.



Logistics Optimization

Analyze logistics costs and delivery delays.



Inventory Management

Detect inventory and demand mismatches.

Ultimately, this analysis supports data-driven supply chain optimization for enhanced operational excellence.

Comprehensive Dataset Overview

Our analysis leverages a rich internal supply chain database, encompassing a wide array of operational metrics.

- Product details (type, SKU, price, availability)
- Sales & revenue data
- Inventory levels and order quantities
- Supplier and manufacturing metrics
- Shipping modes, routes, and costs
- Quality inspection results and defect rates



📄 **Tools Used:** SQL (MySQL), Power BI, DAX

Our Analytical Methodology

We followed a structured approach to ensure a thorough and insightful diagnostic analysis of the supply chain.

01

Data Extraction & Exploration

Utilized SQL to extract and explore raw supply chain data.

02

Root Cause Identification

Performed diagnostic SQL queries to pinpoint underlying issues.

03

KPI & Measure Creation

Developed key performance indicators and measures using DAX in Power BI.

04

Interactive Dashboards

Built dynamic and interactive dashboards for comprehensive visualization.

05

Insights & Recommendations

Interpreted findings to derive actionable business recommendations.

Diagnostic Analysis: Key Questions Answered by SQL

Our SQL queries delved deep into the data to uncover the "why" behind supply chain performance, not just the "what."

- Products with high revenue but low availability?
- SKUs with high sales but frequent stock-outs?
- Suppliers with the highest manufacturing lead time?
- Link between manufacturing cost and defect rates?
- Most expensive transportation modes and routes?
- Order quantities exceeding stock levels?



These targeted questions allowed us to identify critical areas for improvement within the supply chain.

Power BI Dashboard: Overview & Key KPIs

The Power BI overview dashboard provides a high-level view of critical supply chain performance metrics.

₹2M

Total Revenue

₹184K

Total Products Sold

₹233K

Total Cost

₹86.07

Avg Profit Margin

Initial insights reveal revenue concentration among specific SKUs and product types, and uneven distribution across customer demographics.



Supply Chain Report

Overview

Product

Supplier

SKU

All

Supplier name

All

Overview

Total Revenue

₹ 1M

Total Products Sold

₹ 184K

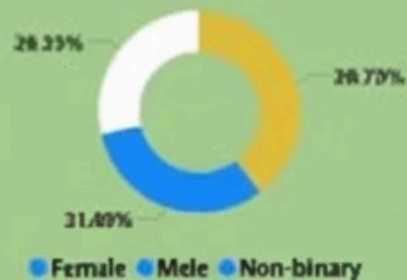
Total Cost

₹ 233K

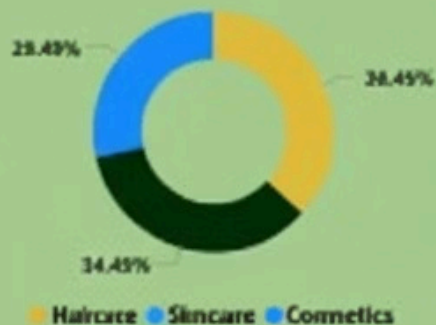
Avg Profit Margin %

₹ 66.07

Total Revenue by Customer demographics



Avg Defect Rate % by Product type



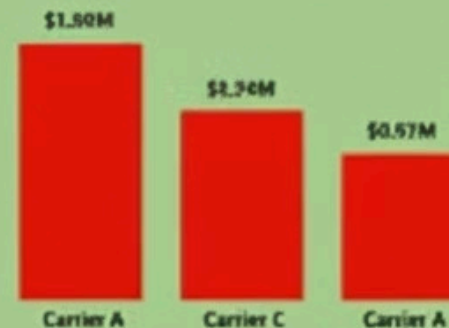
Total Revenue by SKU

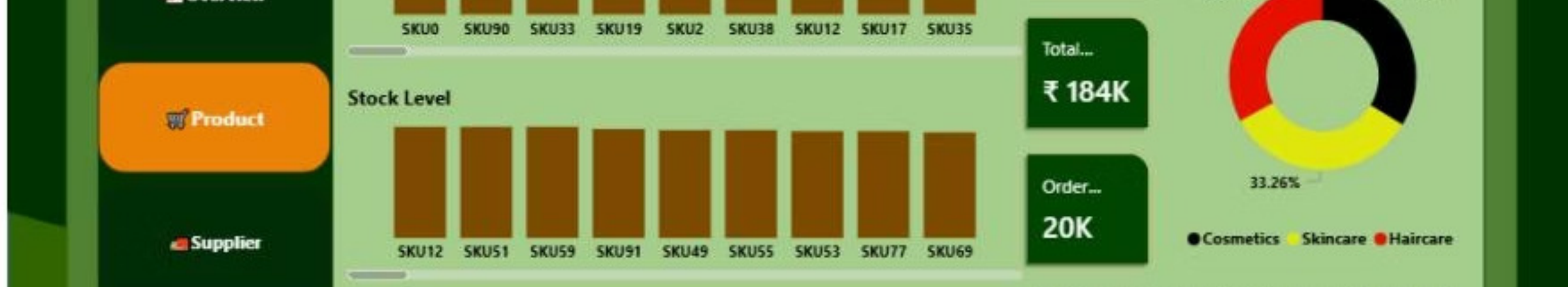


Total Revenue by Product_type



Total Revenue by Shipping_carriers





Product-Level Insights: Inventory & Quality

A deeper dive into product data reveals critical areas for inventory planning and production scheduling improvements.

Key Observations:

- High order quantities but low stock levels for some SKUs.
- Significant lead time variations across products.
- Differing profit margins by product category.
- High-selling products sometimes show quality risks.

Diagnostic Interpretation:

Effective inventory planning and production scheduling are crucial for high-demand products to prevent stock-outs and maintain quality standards.



Supplier & Logistics Insights: Cost, Quality, & Delivery

Supplier performance and logistics strategies are pivotal in managing costs, ensuring quality, and maintaining delivery reliability.

Key Observations:

- Longer manufacturing lead times from certain suppliers.
- Defect rates vary by transportation mode.
- Road and rail transport can incur higher costs.
- Higher manufacturing cost doesn't always guarantee better quality.

Diagnostic Interpretation:

Optimizing supplier selection and transportation modes is essential for cost-efficiency and consistent product quality.



Key Findings: Identifying Root Causes

Our diagnostic analysis uncovered several major issues contributing to supply chain inefficiencies.

Demand-Supply Mismatch

Demand for key products frequently exceeds available stock levels.

Supplier Inefficiencies

Certain suppliers contribute to increased lead times and higher defect rates.

Suboptimal Logistics

Logistics costs are not consistently optimized across all routes and modes.

Quality Control Gaps

Quality failures negatively impact production volume and product availability.



Actionable Recommendations for Optimization

Based on our findings, we propose the following actionable recommendations to enhance supply chain performance.

→ Improve Demand Forecasting

Implement advanced forecasting models for high-selling SKUs to align supply with demand.

→ Re-evaluate Suppliers

Conduct a thorough review of suppliers with high lead times and defect rates, considering alternatives.

→ Optimize Transportation

Analyze and adjust transportation mode selection to reduce costs without compromising delivery times.

→ Strengthen Quality Control

Enhance inspection and control processes throughout the manufacturing and logistics phases.

→ Align Inventory Planning

Integrate inventory planning more closely with real-time order demand and sales forecasts.