

Supply Chain Performance

Project Overview

This project analyzes end-to-end supply chain performance to identify revenue drivers, inventory stockout risks, supplier reliability, and logistics efficiency using cleaned transactional data and interactive Power BI dashboards.

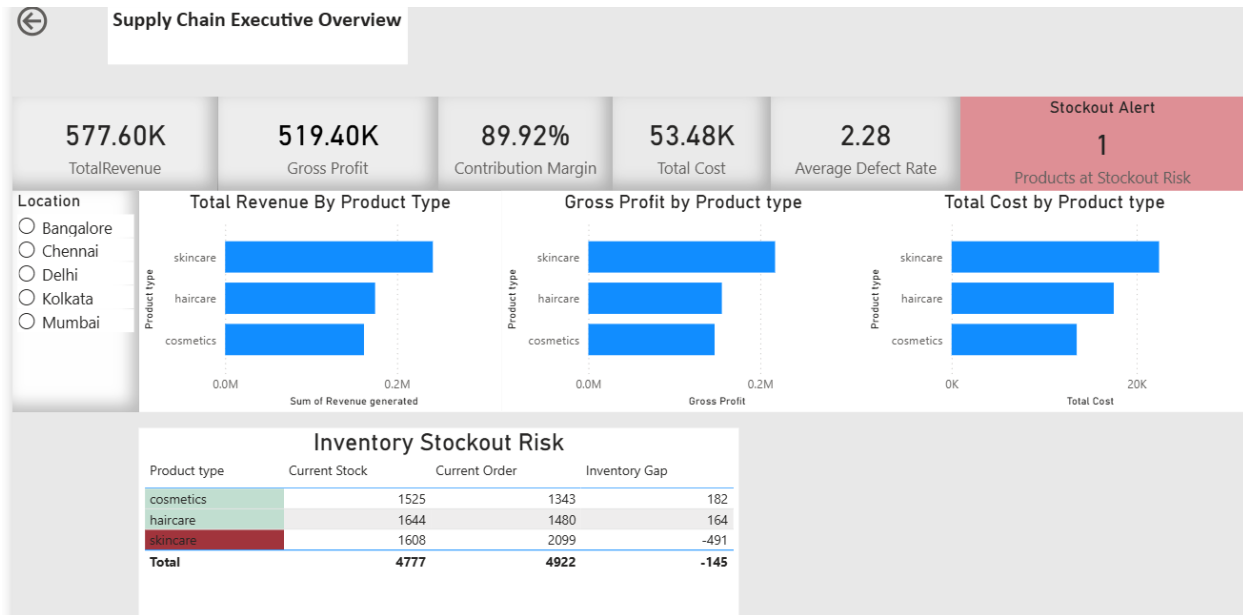
Data Source

Raw supply chain dataset sourced from Kaggle. [supply chain data](#)

Data Analytics (Power BI)

- Imported cleaned dataset into Power BI
- Created DAX measures for:
 - Profitability
 - Cost
 - Inventory stockout risk
 - Composite Supplier Risk Score
 - Carrier Efficiency Score
- Applied conditional formatting for risk prioritization
- Contribution margin based on limited cost fields
- Stock levels are treated as additive within the dataset grain

Executive Summary – Supply Chain Overview



This view provides a high-level snapshot of supply chain health, combining financial performance, quality indicators, and inventory risk into a single executive-facing page.

Key KPIs include:

- Total Revenue and Gross Profit to assess overall business performance
- Contribution Margin and Total Cost to understand operational efficiency
- Average Defect Rate as a quality indicator
- Stockout Alert to highlight immediate inventory risk

Key insights

- **Skincare** emerges as the highest revenue- and profit-generating product category.
- Despite strong financial performance, the skin-care category also faces stockout risk, signaling a mismatch between demand and available inventory.
- Quality levels are relatively stable overall, but defects remain a non-negligible operational factor.

Business takeaway

This dashboard allows leadership to **quickly identify where performance is strong and where immediate intervention is required**, particularly around inventory planning and replenishment decisions.

Supplier Analysis



This section evaluates supplier reliability by examining two critical operational dimensions: **product quality** (measured through defect rates) and **delivery reliability** (measured through supplier lead time). These factors directly influence production continuity, inventory stability, and customer satisfaction. A higher Supplier Risk Score indicates higher risk (worse combined defect + lead time)

Key observations

- **Supplier 5** exhibits the highest average defect rate, indicating elevated quality risk.
- **Supplier 3** shows the longest average lead time, increasing the likelihood of delivery delays.
- **Supplier 1** demonstrates comparatively stable performance across both quality and lead-time metrics.

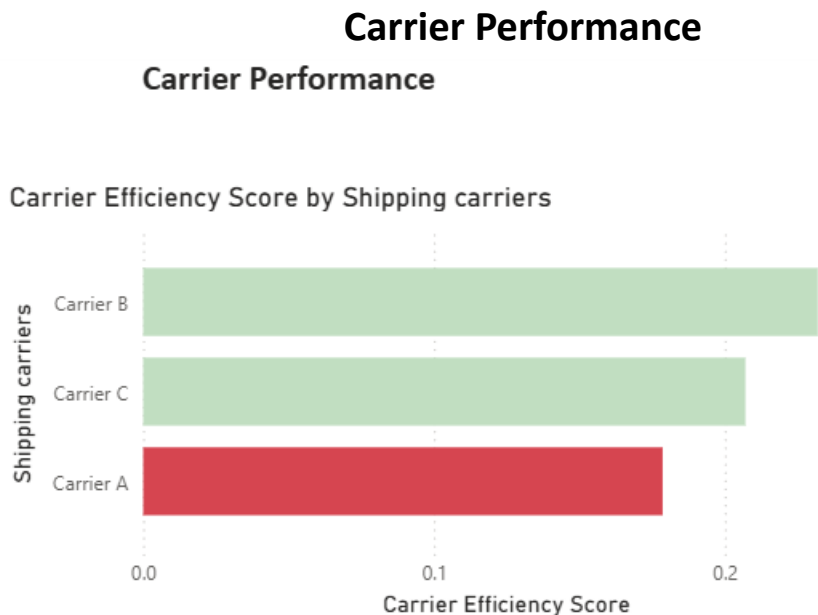
To support prioritization, these individual metrics are combined into a **Composite Supplier Risk Score**, which normalizes defect rates and leads time into a single comparable index.

Insights from the composite risk score

- **Supplier 5 and Supplier 3** rank as the **highest-risk suppliers**, driven by quality and delivery inefficiencies.
- **Supplier 1** ranks as the **lowest-risk supplier**, suggesting greater operational reliability.

Business takeaway

This analysis enables procurement and operations teams to **focus improvement efforts on high-risk suppliers**, supporting targeted quality audits, renegotiating lead times, or supplier diversification strategies.



This section assesses logistics carrier efficiency by balancing **shipping cost**, **delivery time**, and **order volume**. Rather than evaluating these metrics independently, they are combined into a **Carrier Efficiency Score**. Developed a composite Carrier Efficiency Score by normalizing and aggregating shipping cost, delivery time, and order volume to enable objective logistics performance comparison.

Key observations

- **Carrier B** achieves the highest efficiency score, indicating an optimal balance between cost and delivery speed.

- **Carrier C** performs moderately, offering acceptable efficiency but with room for optimization.
- **Carrier A** ranks lowest, suggesting higher costs or slower delivery relative to peers.

Business takeaway

The carrier efficiency score supports **data-driven logistics decisions**, helping operations teams select the most efficient carrier for time-sensitive or cost-critical shipments while identifying underperforming carriers for renegotiation or review.