
Supply Chain Analytics: Business Problem to Insights

Saturday, 31 May 2025

Business Problem

Stakeholders raised concerns about:

- Rising **defect rates** across locations and shipping carriers
- **Inventory imbalances**, particularly overstocking with underperforming sales
- **High shipping costs** without quality improvements
- Lack of clarity on which products, suppliers, or customer segments are **driving or draining value**

The goal:

Identify supply chain inefficiencies, reduce defect rates, and improve profitability across product categories, logistics, and supplier relationships.

Questions Asked Through Power BI Analysis

1. Which **product categories** drive the most revenue, and do they also lead in **defects**?
 2. Which **locations** and **transportation routes** are contributing most to **quality issues**?
 3. Are we **overstocked** on any low-performing products?
 4. Which **shipping carriers** are least cost-effective?
 5. Which **suppliers** contribute the most to revenue, and who underperforms?
 6. How do **customer demographics** relate to both revenue and defect rates?
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Dashboard-Driven Findings

1. Product Category Performance

- **Skincare**: Highest in revenue (~66.8%) but also leads in **defect rates**

- **Haircare:** Highest **stock levels** (1,644 units) but **low revenue**, suggesting **overproduction or poor demand**
- **Cosmetics:** Lowest SKU count and order quantity

2. Defect Hotspots

- **Top defect locations:** Kolkata (57), Chennai (53)
- **Route A** showed the **highest defect rate** (101), pointing to serious logistics issues
- All **transportation modes** (Road, Sea, Air) contributed to high defect totals, with **Road** being worst (76)

3. Inspection Backlog

- ~2,000 units are **pending inspection**, which could delay availability and hide quality issues

4. Shipping Carrier Performance

- **Carrier B:** Highest shipping cost (22.73K) but **no improvement in quality** over others
- All carriers (A, B, C) showed **similar high defect rates** (~75–77), indicating a **systemic issue**

5. Supplier Contribution

- **Supplier 1:** Top contributor to revenue (~577K)
- **Supplier 4 and Supplier 5:** Underperforming — low revenue contribution

6. Customer Demographics

- **Unknown** and **Non-binary** segments generated high revenue (173K, 162K), showing potential or data collection gaps
- **Female customers:** Lowest associated defect rates (48), potentially more satisfied segment

Final Insights & Recommendations

1. **Improve quality controls in Skincare** — high revenue but also high defects indicate a risk to brand and returns.
2. **Investigate Route A immediately** — it's the top contributor to shipping-related defects.
3. **Liquidate or slow production of Haircare** — it's overstocked with weaker sales performance.
4. **Review contracts with Carrier B** — high cost with no corresponding quality advantage.

5. **Address inspection bottlenecks** — clear the 2K pending units to maintain supply chain flow.
6. **Target marketing to Female demographic** — low defects and consistent revenue indicate high customer satisfaction.
7. **Reassess Supplier 4 and 5 performance** — consider renegotiation or supplier replacement.

supply chain