

Final project proposal

Supply Chain Performance Analysis and Optimization

Project description: - This project focuses on analyzing and optimizing the company's supply chain performance using data analytics and Power BI visualization. By integrating and analyzing data across key supply chain functions—sourcing, manufacturing, inventory management, and logistics—the project aims to uncover insights that enhance operational efficiency, reduce costs, and improve overall performance.

The analysis identifies critical pain points such as inefficient inventory control, high shipping expenses, supplier delays, and inconsistent quality. Through detailed examination of KPIs like inventory turnover, supplier lead time, manufacturing cost per unit, and on-time delivery rate, the project will measure current performance and pinpoint opportunities for improvement.

The final deliverable is an interactive Power BI dashboard that visually presents supply chain metrics and trends, enabling decision-makers to track performance, evaluate supplier reliability, and make data-driven decisions that strengthen the company's supply chain strategy.

Team members and their roles: -

- 1-Kholoud Hagag → responsible for data visualization.
- 2-Reham Sobeih → responsible for calculations.
- 3- Ahmed Hussein → responsible for data cleaning.
- 4- Mahmoud Seera → responsible for creating a business context.

Team leader: Kholoud Hagag

Project objectives:

- **Analyze Key Performance Drivers:**
Identify the main factors that influence efficiency, cost, and reliability across the supply chain.
- **Optimize Inventory Levels:**
Use data analysis to recommend optimal stock levels that reduce holding costs while preventing stockouts.
- **Improve Logistics Efficiency:**
Evaluate shipping carriers, costs, and routes to uncover cost-saving opportunities and improve delivery times.
- **Assess Supplier Performance:**
Measure supplier reliability, lead time, and quality to enhance sourcing decisions and supplier relationships.
- **Enhance Manufacturing Performance:**
Analyze production cost and defect data to improve manufacturing efficiency and reduce waste.
- **Provide Actionable Insights via Power BI:**
Design an interactive Power BI dashboard that presents insights visually, empowering stakeholders to make informed, data-driven decisions for supply chain optimization.

Tools & Technologies:

1. **Power BI:** For data visualization, dashboard design, and interactive reporting.
2. **Microsoft Excel:** for exploratory analysis.
3. **Microsoft Word:** For presenting findings, documentation, and final reports.

Milestones & Deadlines:

Problem Definition and Research Questions (19/9/2025)

Data Cleaning Report Template (3/10/2025)

Results and Outcomes Report Template (17/10/2025)

Presentation Outline (31/10/2025)

Key Performance Indicators (KPIs):

- Inventory Turnover
Formula: $(\text{Total Products Sold}) / (\text{Average Stock Levels})$
Measures inventory efficiency and stock movement speed.
- Supplier Lead Time
Formula: Average (Lead Time)
Evaluates supplier responsiveness and delivery efficiency.
- Defect Rate
Formula: $(\text{Total Defective Products}) / (\text{Total Production Volume})$
Assesses product quality and manufacturing reliability.
- Average Shipping Cost per Order
Formula: $(\text{Total Shipping Cost}) / (\text{Number of Orders})$
Tracks logistics cost efficiency.
- Manufacturing Cost per Unit
Formula: $(\text{Total Manufacturing Cost}) / (\text{Production Volume})$
Measures production cost efficiency.
- Revenue per Product
Formula: $\text{Total Revenue} \div \text{Number of Products Sold}$
Measures financial performance by comparing product sales against costs.