

# PROJECT-3

## **Project Description: Supply Chain Analysis and Insights**

This project focuses on analyzing various aspects of a company's supply chain using Python and visualization libraries such as Plotly. The dataset used contains detailed information across multiple dimensions including product types, sales performance, logistics, and quality control metrics.

**Data Exploration:** The project begins with importing and exploring the dataset:

- Key metrics such as product price, availability, sales volume, revenue generated, and customer demographics are examined to understand the dataset's composition and characteristics.

**Exploratory Data Visualization:** Several visualizations are generated to uncover insights:

- **Scatter Plot of Price vs. Revenue:** Analyzes the relationship between product price and revenue, highlighting that skincare products tend to generate higher revenue as their prices increase.
- **Pie Chart of Sales by Product Type:** Illustrates the contribution of different product types (skincare, haircare, cosmetics) to overall sales, revealing skincare as the highest revenue-generating category.
- **Bar Chart of Revenue by Shipping Carrier:** Provides insights into revenue generation by different shipping carriers, emphasizing Carrier B as the most profitable.
- **Comparison of Lead Time and Manufacturing Costs:** Compares average lead times and manufacturing costs across product types, showing variations that could impact operational efficiencies.
- **Line Charts and Bar Charts:** Visualize revenue generated, stock levels, order quantities, shipping costs, and defect rates across different SKUs, offering insights into individual product performance and logistics efficiency.

**Insights and Analysis:** The project highlights several key findings:

- **Revenue Generation:** Skincare products contribute significantly to total revenue, especially those priced higher.
- **Logistics Efficiency:** Analysis of shipping carriers and transportation modes identifies areas where costs are optimized or need improvement.
- **Quality Control:** Identifies variations in defect rates across product types and transportation modes, suggesting potential areas for quality improvement initiatives.

**Conclusion:** This analysis provides actionable insights for optimizing supply chain operations, improving product profitability, and enhancing customer satisfaction through efficient logistics and quality management strategies. The visualizations and metrics derived from the analysis offer a comprehensive overview aimed at supporting strategic decision-making within the company's supply chain management.