

# **E-commerce Return Rate Reduction Analysis**

## **Introduction**

This project focuses on identifying the key reasons behind product returns in an e-commerce setting and exploring the variation of return rates across product categories, geographical regions, and marketing channels. The goal is to provide actionable insights and predictive capabilities to minimize return rates and enhance customer satisfaction.

## **Abstract**

High product return rates impact e-commerce profitability and customer trust. By analyzing return patterns using historical order data, we can detect high-risk areas and develop proactive strategies. This analysis includes return percentages by category and supplier, predictive modeling using logistic regression, and visualizations for decision-making.

## **Tools Used**

- Python: Data cleaning, analysis, pre-processing and predictive modeling.
- Power BI: Interactive dashboard for visualizing return risk scores.

## **Steps Involved in Building the Project**

### **1. Data Cleaning:**

Handled missing values and inconsistent entries in order and return datasets.

### **2. Exploratory Data Analysis:**

Analyzed return rates per product category and supplier.

Assessed geographic and channel-wise return trends.

### 3. **Predictive Modeling:**

Used logistic regression to predict the probability of a return based on product and customer features.

### 4. **Visualization:**

Created a Power BI dashboard with return risk scores to highlight high-risk segments.

Integrated filters by category, supplier, and region for better insights.

## Conclusion

The analysis successfully highlighted key return drivers and identified high-risk segments. Predictive modeling provided a return probability score, aiding proactive measures. The Power BI dashboard enables dynamic monitoring and strategy development to reduce return rates effectively.

