E-commerce Return Rate Reduction Analysis

Introduction

The growth of e-commerce has introduced both opportunities and challenges. One of the major challenges faced by online businesses is the high return rate of products. This project focuses on analyzing the reasons behind product returns and developing strategies to reduce return rates through data-driven insights.

Abstract

This project analyzes product returns across different categories, suppliers, geographies, and marketing channels. Using Python, SQL, and Power BI, the study identifies key factors influencing returns, predicts high-risk products with logistic regression, and visualizes results in an interactive dashboard. The final deliverables provide actionable insights to reduce return rates and improve customer satisfaction.

Tools Used

- Python (Data cleaning, Logistic Regression model)

- SQL (Data extraction, transformations, and queries)

- Power BI (Dashboard creation and visualization)

Steps Involved in Building the Project

1. Cleaned and pre-processed order and return datasets.

2. Analyzed return percentages per category, supplier, and geography.

3. Applied logistic regression to predict probability of product returns.

4. Developed a return risk score for each product.

5. Built an interactive Power BI dashboard with drill-through filters.

6. Exported CSV file of high-risk products for business action.

Conclusion

The project successfully identified key drivers of product returns and provided predictive insights using logistic regression. The interactive dashboard empowers businesses to monitor return risks in real-time, while the high-risk product list enables targeted interventions. Overall, this project demonstrates how data analytics can help reduce return rates, save costs, and enhance customer satisfaction in e-commerce.