E-COMMERCE RETURN RATE REDUCTION ANALYSIS PROJECT

INTRODUCTION:

Product returns are a major challenge in the e-commerce industry, affecting profitability and customer satisfaction. This project aims to analyse the key factors behind high return rates and suggest effective strategies to reduce them. By examining customer behaviour, product details, and order information through data analysis, we seek to identify patterns and provide insights that can help e-commerce businesses minimize returns and improve overall service quality.

ABSTRACT:

This project analyses return patterns in e-commerce to identify the main causes of product returns. Using data analysis techniques, we explore customer behaviour, product types, and order details to uncover trends leading to high return rates. The findings help in recommending practical solutions such as improving product descriptions, sizing accuracy, and delivery processes. The goal is to reduce return rates, enhance customer satisfaction, and improve business efficiency.

TOOLS USED:

Microsoft Power BI, Python and SQL

Data Visualization: Matplotlib and Seaborn

Power Query Editor, DAX Measures and Dashboard Design

DAX Measure for custom KPI cards and metrics

Line charts, bar charts and other visuals for enhance insights

Steps Involved in Building the Project:

- **Data Collection: Gather return-related data from e-commerce platforms (orders, returns, customer info, product info, etc.).**
- **Data Cleaning & Preprocessing: Load data using Pandas, handle missing/null values, Format date/time fields, categories, etc., Remove duplicates and incorrect entries.**

- **Exploratory Data Analysis (EDA): Use Seaborn/Matplotlib for return rate trends, customer behaviour, product category patterns, etc., Identify patterns or anomalies related to high return rates.**
- **Data Export / Aggregation for Power BI: Export cleaned and processed data into .csv or directly use the output in Power BI.**

- **Power BI Data Import (.pbix): Load the processed dataset into Power BI.**

Dashboard Creation:

  - **Build interactive visuals: Return trends over time, Category-wise return rate, Region/customer segment insights, Return reasons & patterns.**

Insights & Recommendations:

- **Highlight key drivers for high returns (e.g., product categories, delivery delays).**
- **Suggest actions: product quality improvement, better sizing guides, better product descriptions, etc.**
- **Polish the dashboard with filters, slicers, titles, and tooltips.**

CONCLUSION:

The project successfully analysed return patterns in e-commerce using Python and Power BI. Key factors contributing to high return rates were identified, such as specific product categories, frequent return customers, and common return reasons. Through data visualization and trend analysis, actionable insights were derived to reduce returns—such as improving product descriptions, enhancing quality control, and targeting high-return segments. Implementing these strategies can help minimize return rates, reduce operational costs, and improve overall customer satisfaction.