Customer Behaviour Analysis Project

Tools Used: Python | SQL Server | Power BI

Project Overview

This project analyzes **customer shopping behavior** to identify key drivers of revenue, customer loyalty, and purchasing patterns. The goal is to help businesses make informed decisions related to **subscriptions, discounts, product strategy, and customer segmentation**.

Business Objectives

- Understand how customer demographics impact revenue
- Evaluate the effectiveness of subscriptions and discounts
- Identify top-performing products and categories
- Analyze customer loyalty and repeat purchasing behavior
- Visualize insights using an interactive Power BI dashboard

Dataset Summary

The dataset contains customer-level transactional data including:

- Demographics (Gender, Age Group)
- Purchase details (Purchase Amount, Product, Category)
- Behavioral attributes (Previous Purchases, Subscription Status)
- Logistics (Shipping Type)
- Customer feedback (Review Ratings)

Python Analysis (Data Preparation & EDA)

Python was used to:

- Clean and validate the dataset
- Handle missing and inconsistent values
- Perform exploratory data analysis

- Analyze distributions of purchase amount and ratings
- Identify early trends across categories and age groups

This step ensured **high data quality** before applying SQL queries and Power BI visualizations.

SQL Analysis – Business Questions & Insights

- **Revenue by Gender**

Analyzed total revenue contribution from male and female customers to understand demographic spending patterns.

- **High-Value Customers Using Discounts**

Identified customers who used discounts but still spent above the average purchase amount, showing that discounts do not always reduce revenue.

- **Top-Rated Products**

Evaluated products with the highest average review ratings to highlight items with strong customer satisfaction.

- **Shipping Type vs Spending**

Compared average purchase amounts between standard and express shipping users to assess how delivery preference impacts spending behavior.

- **Subscription Impact on Revenue**

Compared subscriber and non-subscriber spending in terms of customer count, average purchase value, and total revenue to evaluate subscription effectiveness.

- **Discount Dependency by Product**

Measured which products have the highest proportion of discounted purchases to identify price-sensitive items.

- **Customer Segmentation**

Segmented customers into New, Returning, and Loyal based on past purchase behavior to understand loyalty distribution.

- **Top Products by Category**

Identified the most frequently purchased products within each category to support inventory and sales planning.

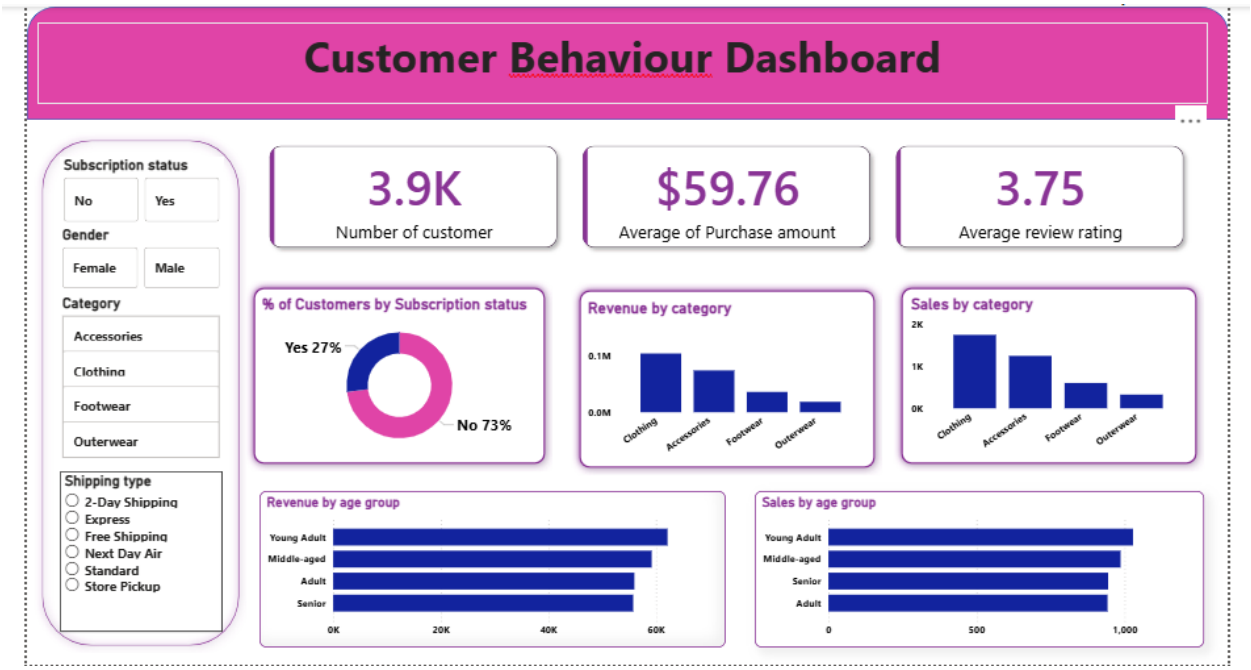
- **Repeat Buyers & Subscription Behavior**

Analyzed whether customers with frequent past purchases are more likely to subscribe, highlighting loyalty-to-subscription trends.

- **Revenue Contribution by Age Group**

Calculated total revenue by age group to identify the most profitable customer segments.

Power BI Dashboard Overview



- **Key Performance Indicators**

- Total Customers: **3.9K**
- Average Purchase Amount: **$59.76**
- Average Review Rating: **3.75**

- **Subscription Distribution**

Only **27%** of customers are subscribed, revealing significant potential for subscription growth.

- **Category Performance**

- Clothing leads in both sales volume and revenue
- Outerwear shows the lowest contribution

- **Age Group Analysis**

Young Adults generate the highest sales and revenue, followed by Middle-aged customers.

- **Interactive Filters**

Users can filter insights by:

- Gender
- Product Category
- Shipping Type
- Subscription Status

This enables **dynamic and user-driven analysis**.

Key Insights

- Subscribed customers spend more and generate higher total revenue
- Discounts do not negatively impact high-value customers
- Clothing is the strongest revenue-driving category
- Young Adults are the most profitable customer segment
- Loyal customers show a higher tendency to subscribe

Business Recommendations

- Promote subscription plans to returning customers
- Use discounts strategically on price-sensitive products
- Focus marketing efforts on Young Adult customers
- Invest in loyalty programs to convert repeat buyers into subscribers
- Prioritize high-rated and high-performing products

Conclusion

This project demonstrates an end-to-end analytics workflow using **Python for data preparation, SQL for business analysis, and Power BI for visualization**.
The insights generated can help businesses improve **customer retention, revenue growth, and strategic decision-making**.