PROJECT REPORT

Customer Behaviour Analysis

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Domain: Data Analytics / Data Science

Tools Used: Python, SQL, Power BI

This report presents an end-to-end analysis of customer shopping behavior using data analytics techniques. The project was completed as part of practical learning to understand real-world business data and generate actionable insights.

1. Introduction

Customer Behavior Analysis is a crucial process for businesses to understand purchasing patterns, customer preferences, and spending habits. By analyzing historical transaction data, organizations can improve marketing strategies, product placements, and customer engagement. This project focuses on analyzing customer shopping data and transforming raw datasets into meaningful insights through data cleaning, analysis, and visualization.

2. Project Objectives

- To analyze customer purchasing behavior.
- To identify high value customers.
- To examine product category performance.
- To generate business insights using data visualization.
- To build an interactive Power BI dashboard.

3. Tools & Technologies Used

Tool / Technology	Purpose
Python	Data Analysis & Processing
Pandas	Data Manipulation
SQL	Data Querying & Aggregation , Analysis
Power BI	Dashboard & Visualization
VS Code	Analysis Environment

4. Dataset Description

The dataset used in this project contains customer shopping transaction records. It includes demographic information, purchase frequency, product categories, and spending values. Key attributes include:

- Customer ID
- Gender & Age
- Product Category
- Purchase Amount
- Transaction Date

5. Data Processing & Cleaning

Data preprocessing is a critical step before analysis. The following steps were performed: • Handling missing values.
• Removing duplicate records.
• Correcting inconsistent data types.
• Standardizing column names.
• Preparing cleaned dataset for analysis.

6. Exploratory Data Analysis (EDA)

EDA was conducted to understand data distribution and relationships. Various statistical and visual techniques were used:

• Distribution plots.
• Category wise spending analysis.
• Gender based purchase comparison.
• Trend analysis.

7. SQL Based Analysis

SQL queries were used to extract meaningful business metrics: • Total revenue calculation.
• Top spending customers.
• Category wise sales.
• Monthly purchase trends.

8. Power BI Dashboard

An interactive dashboard was created in Power BI to visualize insights. It includes KPI cards, bar charts, pie charts, and slicers for filtering data. Dashboard highlights:
• Total Sales Overview
• Customer Segmentation
• Product Performance
• Time−based Trends

9. Key Insights

• High spending customers were identified.
• Certain product categories generated maximum revenue.
• Seasonal trends influenced purchase behavior.
• Customer segmentation supported targeted marketing.

10. Conclusion

This project demonstrates the complete lifecycle of a data analytics project — from raw data collection to dashboard visualization. It highlights the importance of data driven decision−making and showcases practical skills in Python, SQL, and Power BI.