Customer Transaction & Behavior Analysis

Alfido Tech – Data Analytics Project

Code Link

Introduction

This project focuses on analysing customer transaction and behavioural data to identify purchase patterns, customer segments, and potential churn risks. The objective is to build practical data analytics skills including data cleaning, exploratory analysis, visualization, and business-oriented reporting using a real-world dataset.

The insights generated from this analysis aim to support Alfido Tech in improving customer engagement, retention, and revenue growth.

Dataset Overview

- **Source:** Kaggle (E-commerce customer transaction dataset)

- **Total Records:** 250,000 transactions

- **Total Customers:** 49,673

- **Key Attributes:**
  Customer ID, Purchase Date, Product Category, Product Price, Quantity, Total Purchase Amount, Payment Method, Customer Age, Gender, Returns, Churn

The dataset represents real-world customer purchasing behaviour across multiple product categories and payment methods.

Data Cleaning and Preparation

The following steps were performed to ensure data quality:

- Converted purchase date into proper datetime format

- Removed duplicate age columns and retained a single valid age attribute

- Handled missing values in the Returns column by treating them as zero

- Ensured numeric consistency for price, quantity, and total purchase amount

- Validated data for invalid prices, quantities, and unrealistic age values

After cleaning, the dataset was suitable for reliable analysis.

Exploratory Data Analysis (EDA)

Key Findings

- **Average Purchase Value:** $2,725

- **Typical Quantity per Order:** 1 item

- **Customer Age Range:** 18 to 70 years

- **Overall Churn Rate:** ~20%

Category Performance

- Books and Clothing are the top revenue-generating categories

- Electronics and Home categories contribute moderate revenue

Payment Preferences

- Credit Card: 40.2%

- PayPal: 29.9%

- Cash: 20.0%

- Crypto: 9.9%

This indicates a strong preference for digital payment methods.

Visual Analysis

The following visualizations were created:

- Revenue by Product Category

- Payment Method Distribution

- Customer Age Distribution

- Customer Count by Segment

- Average Monetary Value by Segment

These visuals helped identify high-value segments and dominant customer behaviours.

Customer Segmentation (RFM Analysis)

Customers were segmented using **RFM (Recency, Frequency, Monetary)** analysis.

Segment Summary

Segment	Customer Count	Avg Monetary Value	Avg Recency
Champions	13,796	21,385	99 days
Loyal Customers	11,469	15,042	185 days
Potential Loyalists	11,195	11,049	254 days

Segment	Customer Count	Avg Monetary Value	Avg Recency
At Risk	8,462	7,870	377 days
Low Value	4,751	4,945	716 days

Churn rate across segments remained close to 20%, indicating retention opportunities even among high-value customers.

Actionable Recommendations

1. **Strengthen loyalty programs for Champions**
   Offer exclusive rewards, early product access, and premium support to retain high-value customers.

2. **Convert Potential Loyalists into Champions**
   Use personalized offers and recommendations to increase purchase frequency and spending.

3. **Re-engage At Risk customers**
   Run targeted reactivation campaigns such as comeback discounts or reminder emails.

4. **Automate engagement for Low Value customers**
   Use low-cost automated communication strategies to improve engagement without high marketing spend.

5. **Optimize checkout and payment experience**
   Focus on improving Credit Card and PayPal payment flows, as they are the most preferred methods.

Conclusion

This analysis successfully identified key customer segments, purchasing patterns, and engagement opportunities for Alfido Tech. By applying data cleaning, visualization, and RFM-based segmentation, actionable insights were generated to support business decision-making. Implementing the recommended strategies can help Alfido Tech improve customer retention, engagement, and long-term revenue growth.