Customer Clustering Report

Overview

This report summarizes the clustering analysis conducted on the eCommerce transactions dataset to segment customers into meaningful groups based on their purchasing behavior. The goal is to provide actionable insights for targeted marketing and customer engagement strategies.

Key Findings

1. Optimal Number of Clusters

The Davies-Bouldin Index was used to determine the optimal number of clusters, which evaluates how well-separated the clusters are.

The analysis identified that the optimal number of clusters is 3, with the lowest DBI value of 0.75. This indicates well-defined clusters with minimal overlap.

2. Characteristics of Clusters

Cluster 0: High-Value Customers

Customers in this group have the highest total spending and frequent transactions.

They are the most valuable segment for the business.

Action: Focus on retaining these customers by offering loyalty rewards, personalized discounts, and premium services.

Cluster 1: Moderate Customers

These customers exhibit moderate spending and an average number of transactions.

They represent a significant portion of the customer base.

Action: Use targeted promotions and personalized offers to encourage more frequent purchases.

Cluster 2: Low-Value Customers

Customers in this cluster have low spending and infrequent transactions.

They are less engaged with the business.

Action: Re-engage these customers with marketing campaigns, discounts, and promotions to increase their activity.

3. Cluster Distribution

The majority of customers belong to Cluster 1 (Moderate Customers), followed by Cluster 0 (High-Value Customers) and Cluster 2 (Low-Value Customers).

Visualizations

Cluster Scatterplot:

Displays customer clusters based on total spending and transaction frequency.

Clearly shows how customers are grouped into high-value, moderate, and low-value segments.

Cluster Size Distribution:

A bar chart representing the number of customers in each cluster.

Highlights the dominance of moderate customers (Cluster 1).

Metrics

Features Used:

Total Spending

Average Quantity Purchased

Transaction Count

Optimal Number of Clusters: 3

Davies-Bouldin Index: 0.75

Recommendations

High-Value Customers (Cluster 0):

Provide exclusive benefits such as loyalty programs, early access to sales, and personalized services to retain them.

These customers are critical to maintaining high revenue.

Moderate Customers (Cluster 1):

Encourage higher engagement by introducing discounts, upselling opportunities, and personalized promotions based on their purchase history.

Focus on converting them into high-value customers.

Low-Value Customers (Cluster 2):

Re-engage with targeted campaigns, such as special discounts or offers.

Understand barriers to engagement through surveys or feedback.

Long-Term Strategy:

Regularly update clustering models with new data to monitor changes in customer behavior.

Use these insights to adjust marketing strategies dynamically.