Customer Segmentation Report

Introduction

This report documents the results of customer segmentation analysis using clustering techniques. The objective was to group customers into distinct clusters based on their transaction behavior and profile information.

Methodology

1. Features were engineered from the dataset to capture customer behavior:
   - TotalSpend: Total value of transactions by the customer.
   - TransactionFrequency: Number of transactions made.
   - UniqueCategories: Number of unique product categories purchased.
   - Recency: Number of days since the last transaction.

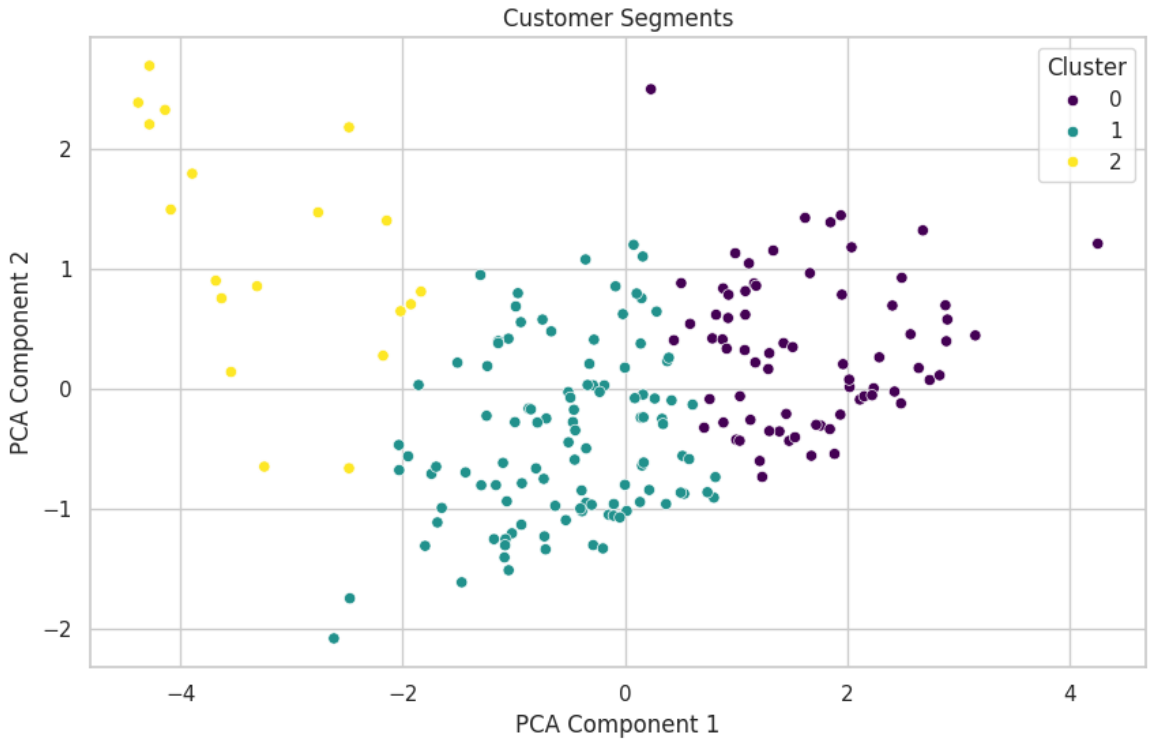
2. The features were normalized using StandardScaler to ensure comparability.
3. K-Means clustering was applied for segmenting customers, and the Davies-Bouldin Index (DB Index) was used to evaluate cluster quality for 2 to 10 clusters.
4. The optimal number of clusters was selected based on the minimum DB Index value.

Results

The analysis identified the optimal number of clusters as 3, with a minimum DB Index of 0.965, indicating well-defined and compact clusters. The clusters are visualized using PCA components to observe their separation.

Cluster Visualization

Customer Segmentation Report



Insights

1. Cluster 0: High spenders with frequent transactions and diverse product purchases.

2. Cluster 1: Low spenders with fewer transactions and limited product diversity.

3. Cluster 2: Moderate spenders with moderate transaction frequency and category variety.

These segments can be used to tailor marketing strategies and improve customer engagement.

Durbin-Watson Test Visualization

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