Customer Segmentation / Clustering

Introduction

This report highlights the results of customer segmentation using clustering techniques. The analysis groups customers based on their profiles and transaction behavior to identify distinct segments for targeted marketing and operational strategies.

Key Findings and Results

1. **Optimal Number of Clusters**

   o **Finding:** Based on the Davies-Bouldin Index (DB Index), the optimal number of clusters is **X**.

   o **Implication:** This segmentation provides the best balance between cluster compactness and separation.

   o **DB Index Value: Y**.

2. **Cluster Characteristics**

   o **Finding:** Segments differ significantly in terms of transaction value and purchase behavior.

   o **Implication:** Tailored strategies for each segment can enhance customer satisfaction and profitability.

   o **Example Segments:**

      ▪ Cluster 0: High-value customers with frequent purchases.

      ▪ Cluster 1: Low-frequency shoppers with small transaction values.

Methodology

1. **Data Preparation:**

   o Combined profile data (Customers.csv) and transaction data (Transactions.csv).

   o Aggregated features: TotalValue (sum of transaction values), Quantity (total quantity purchased).

   o Scaled features using StandardScaler.

2. **Clustering Technique:**

   o Applied **K-Means clustering** with a range of clusters (k=2 to k=10).

   o Used the **Davies-Bouldin Index (DB Index)** to evaluate clustering performance.

   o Selected the number of clusters with the lowest DB Index value.

3. **Visualization:**

   o   Generated a scatter plot of TotalValue vs. Quantity, color-coded by cluster.

Summary of Opportunities

1. **Target High-Value Segments:** Focus on high-spending customers with exclusive offers and rewards.

2. **Engage Low-Value Segments:** Use retention strategies for low-frequency customers to increase purchase frequency.

3. **Improve Marketing ROI:** Tailor campaigns to specific segments for better conversion rates.

Conclusion

Customer segmentation reveals actionable insights for personalizing marketing efforts, optimizing resource allocation, and enhancing overall business performance. By leveraging these insights, businesses can maximize customer value and drive sustained growth.

REPORT BY:

BHARATHI S