Customer Segmentation Report

Overview

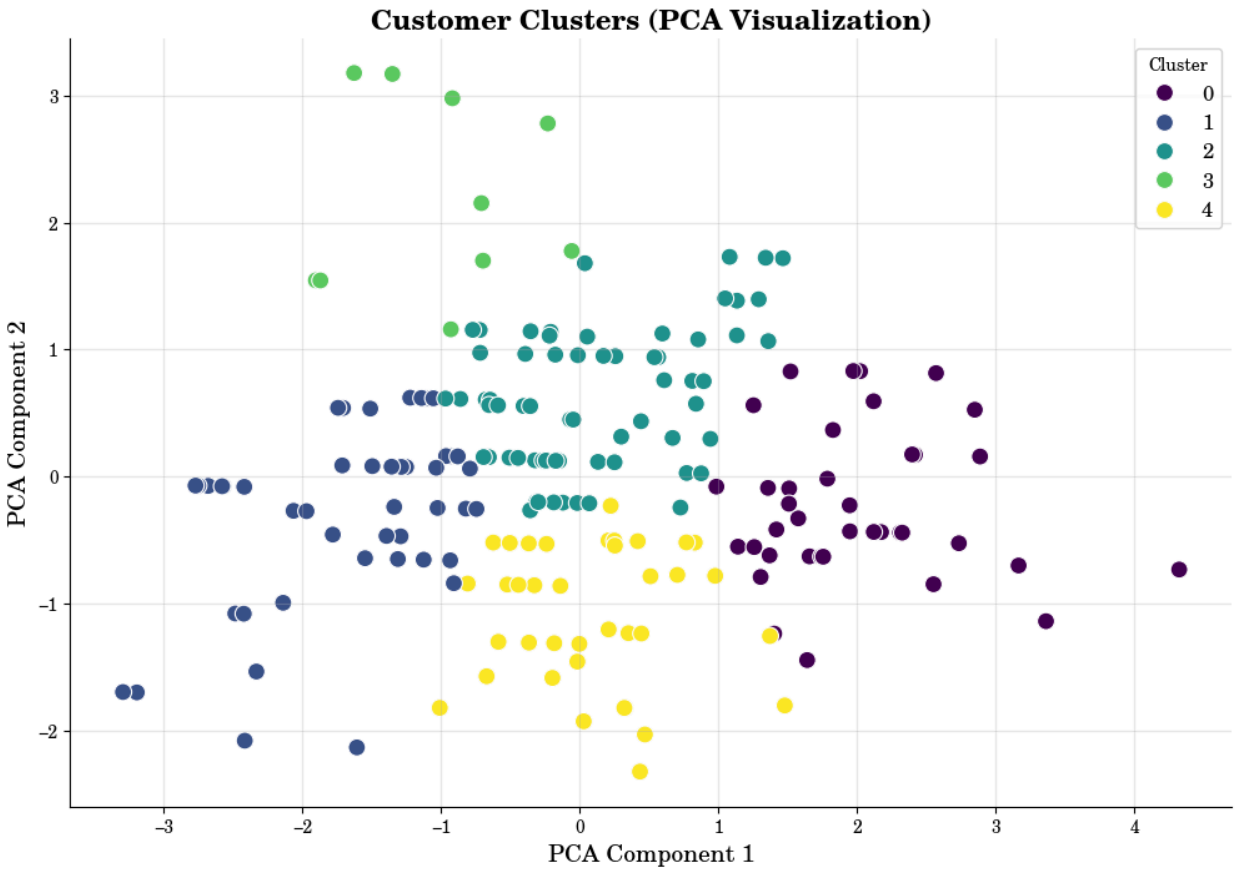
Clustering analysis was performed to segment customers based on their transaction behavior and spending patterns. This helps in identifying distinct customer groups for targeted marketing and personalized recommendations.

Approach

1. **Feature Engineering**:
    - Aggregated data to compute:
        - Total revenue per customer.
        - Average quantity purchased.
        - Total number of transactions.
    - Standardized the features using `StandardScaler`.
2. **Clustering Algorithm**:
    - Applied **KMeans clustering** with 5 clusters.
    - Used the **Davies-Bouldin Index** for evaluation, achieving a score of **0.94**, indicating well-defined clusters.
3. **Cluster Visualization**:
    - Reduced data dimensions using **PCA** for 2D visualization.
    - Scatter plot of clusters displayed distinct groups of customers.

Clustering Results

- **Cluster Profiles**:
    - **Cluster 0**: High-value customers with large transaction volumes.
    - **Cluster 1**: Moderate spenders who purchase frequently.
    - **Cluster 2**: Low spenders with occasional transactions.
    - **Cluster 3**: Premium customers with high average transaction values.
    - **Cluster 4**: Budget-conscious buyers with low transaction values.



Recommendations

- Develop loyalty programs for high-value customers in Clusters 0 and 3.
- Target budget-conscious customers in Cluster 4 with discounts and promotions.
- Focus on converting moderate spenders in Cluster 1 to high-value customers through upselling.