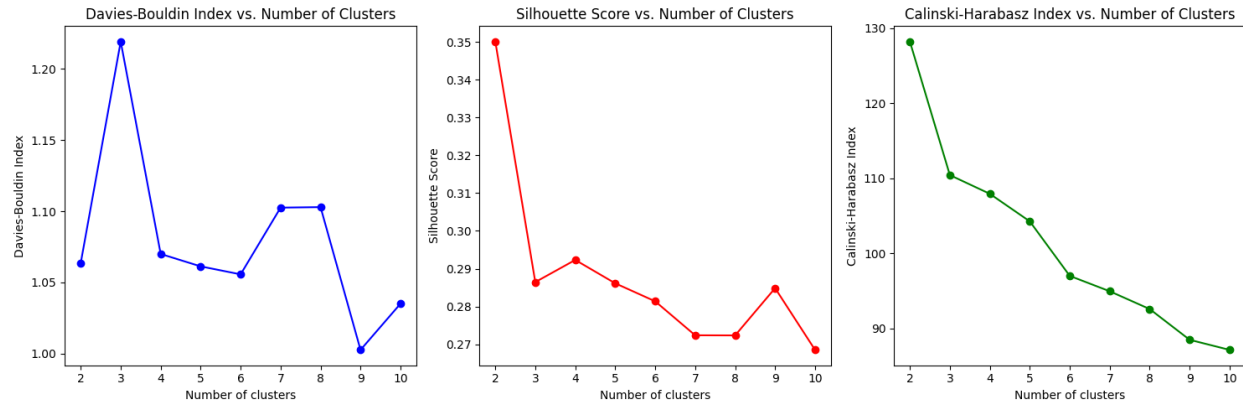


Customer Segmentation Analysis Report

1. Number of clusters formed: 9



2. Davies-Bouldin (DB) Index: 1.0027

- Lower values indicate better-defined clusters

3. Other relevant clustering metrics:

a. **Silhouette Score:** 0.2849

- Range: -1 to 1, higher values indicate better-defined clusters

b. **Calinski-Harabasz Index:** 88.5094

- Higher values suggest better cluster separation

4. Key Cluster Characteristics:

- High-value segments: Clusters 2, 3, 5, 7, 8

- Frequent shoppers: Cluster 1

- Average/low-value segments: Clusters 0, 4, 6

Most valuable segment (Cluster 5):

- Avg. transaction count: 9.56

- Avg. total spend: \$7,231.87

Highest avg. transaction value (Cluster 7):

- Avg. transaction value: \$1,108.35

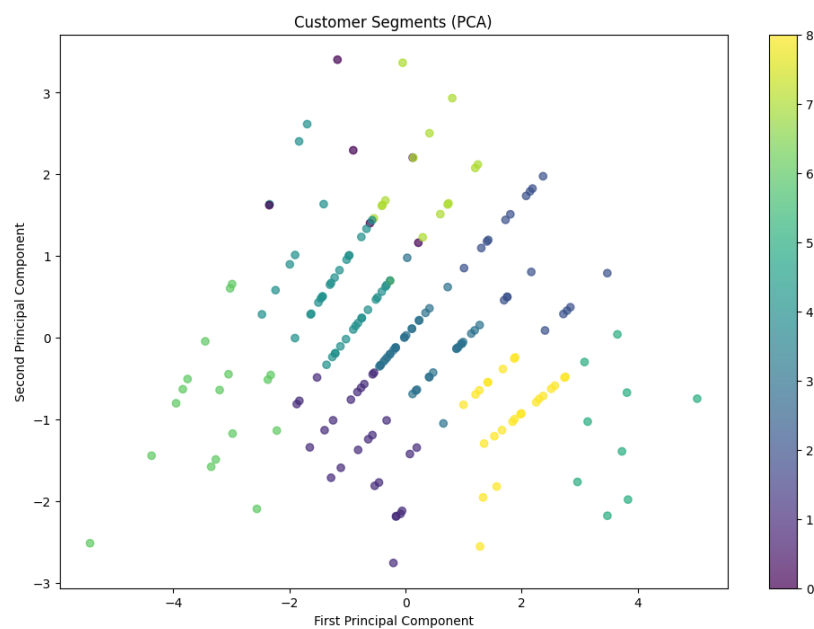
Least valuable segment (Cluster 6):

- Avg. total spend: \$605.96

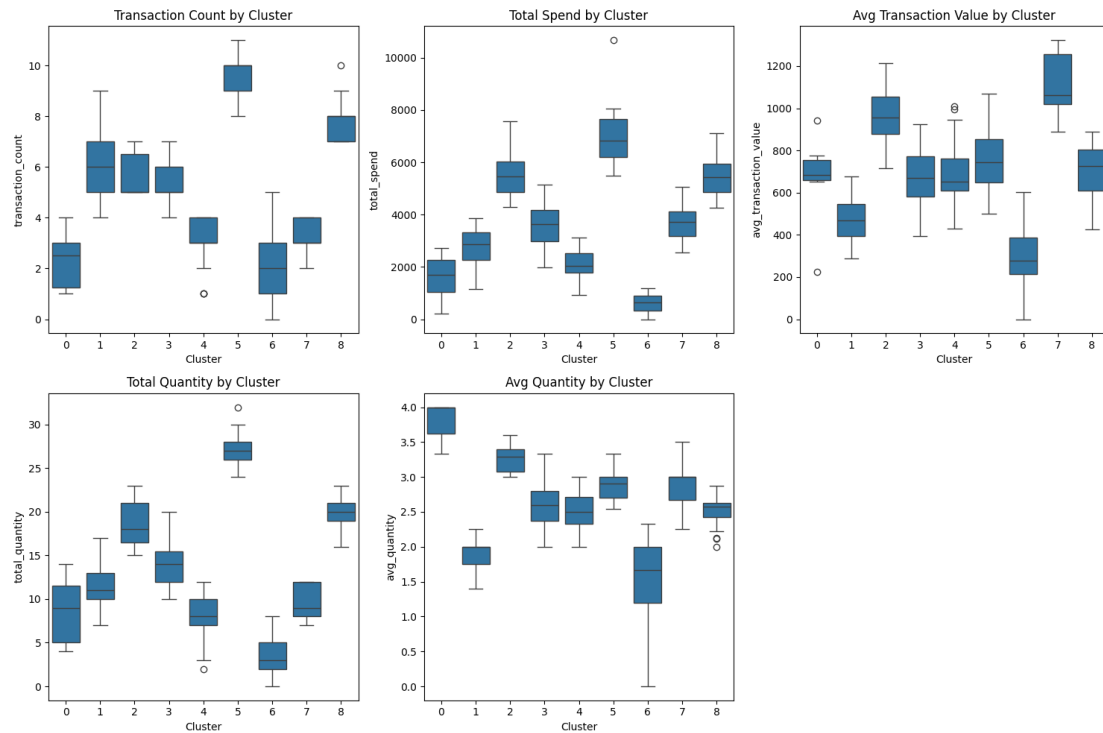
- Avg. transaction count: 2.06

5. Visualization Insights:

- PCA plot shows some overlap between clusters



- Box plots reveal variations in total spend and avg. transaction value across clusters



- More consistent patterns in transaction count and quantity for most clusters

Conclusion:

The 9-cluster segmentation provides distinct customer groups with varying purchasing behaviors. While reasonably well-defined, there is some overlap between segments. This segmentation offers valuable insights for targeted marketing strategies and customer relationship management.