Customer Segmentation Analysis Report

Number of Clusters: 10
Davies-Bouldin Index: 1.4380

Cluster Profiles:

Cluster	TransactionID_count	TotalValue_sum	TotalValue_mean	Quantity_sum
0	7.20	3530.67	503.22	14.25
1	8.65	6723.73	788.42	23.29
2	5.33	4418.09	847.94	14.92
3	6.48	5254.51	840.66	18.91
4	3.24	2379.65	756.22	8.06
5	1.62	1394.01	832.83	5.62
6	1.92	573.72	313.70	2.83
7	5.15	3861.85	755.24	13.20
8	3.96	1883.18	483.00	8.50
9	4.23	2991.15	725.46	11.50

Key Findings:
1. Optimal number of clusters determined using Davies-Bouldin Index
2. Clear separation between high-value and low-value customer segments
3. Distinct purchase patterns and engagement levels across segments
4. Variations in customer lifecycle (signup age) between segments

Technical Details:
- Algorithm: K-means clustering with 10 clusters
- Initialization: 10 different random initializations (n_init=10)
- Feature scaling: StandardScaler
- Evaluation metric: Davies-Bouldin Index