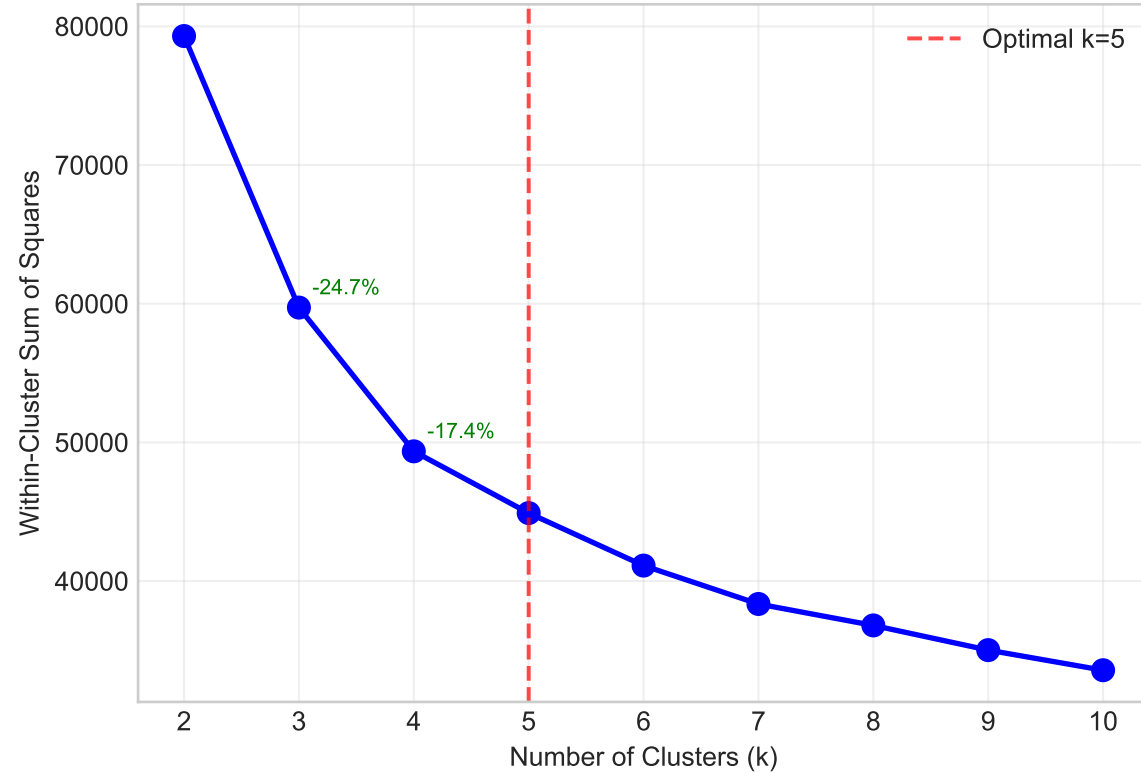
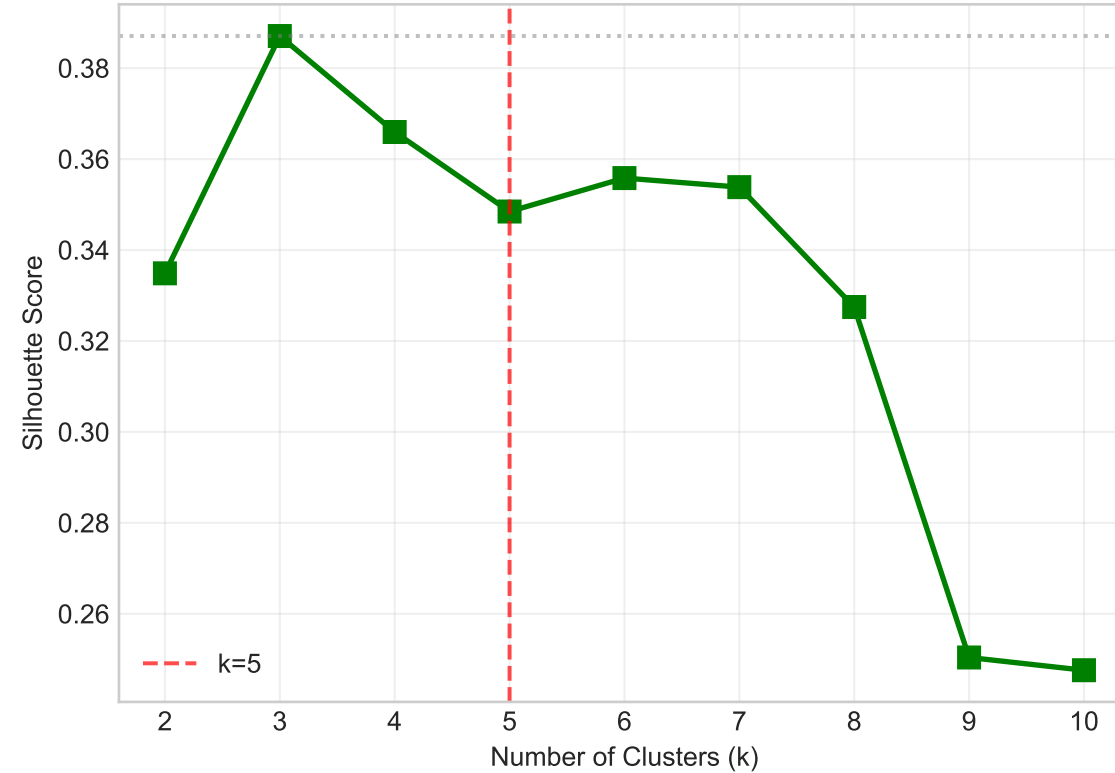


Cluster Quality Metrics Dashboard: Validating k=5

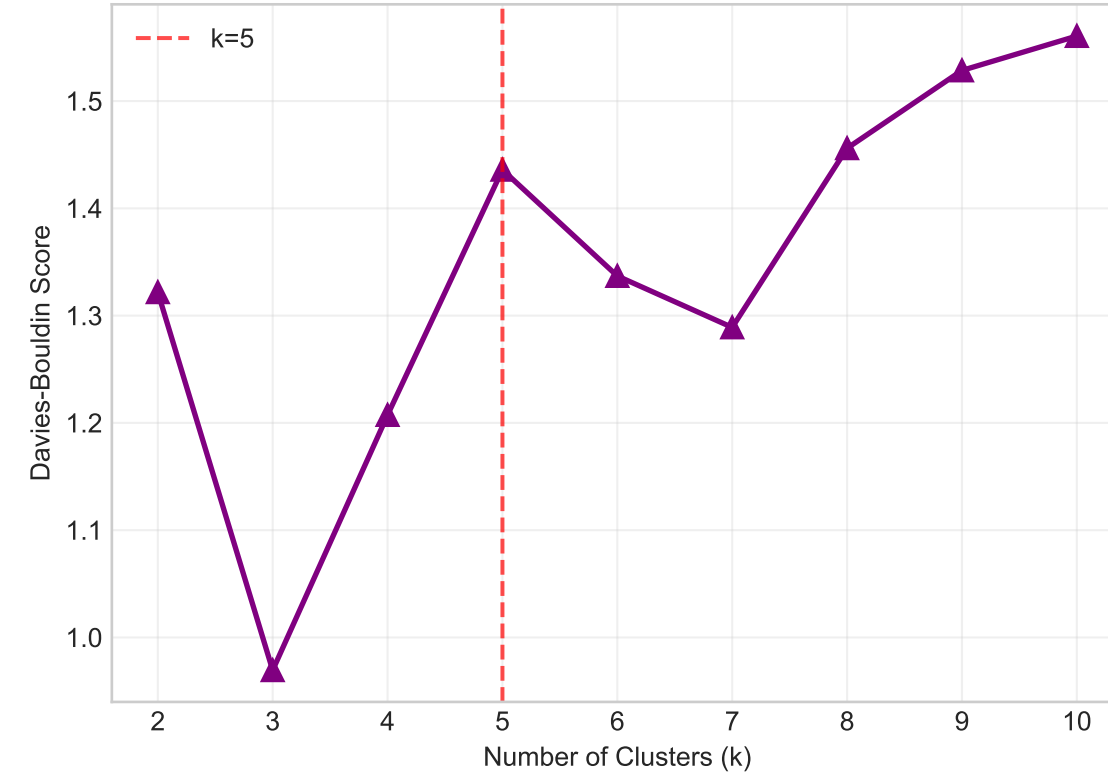
Elbow Method: Finding Optimal k



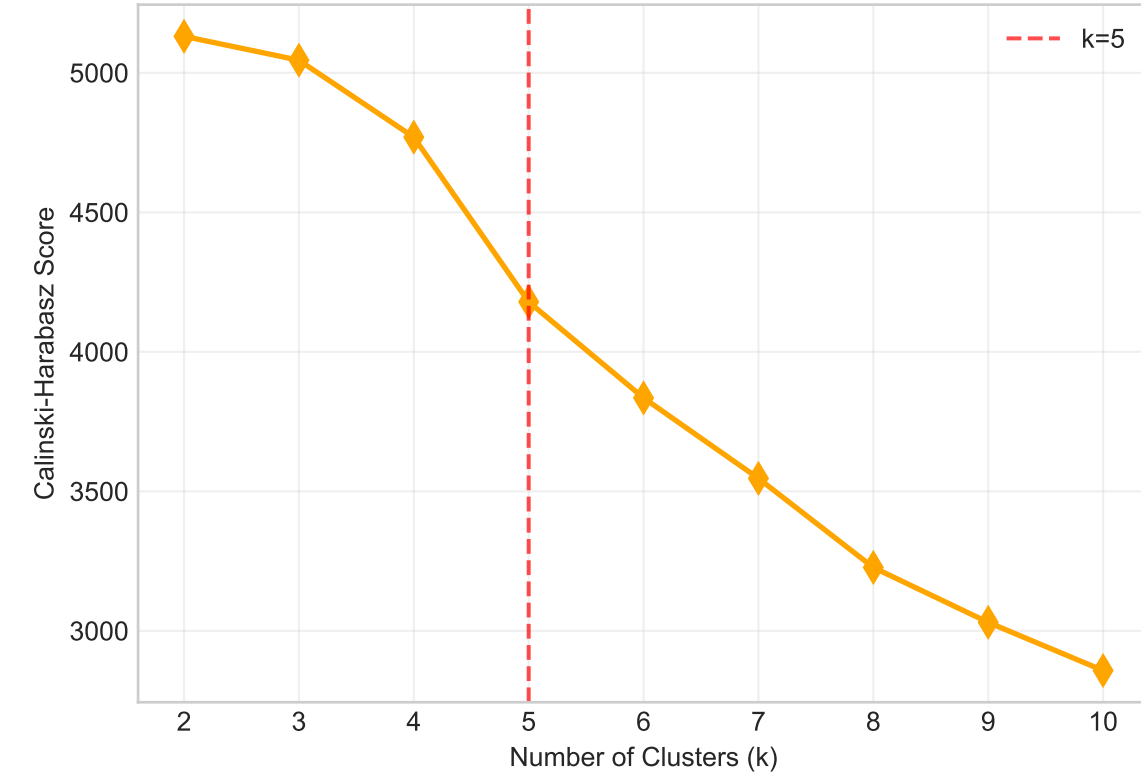
Silhouette Analysis: Cluster Cohesion



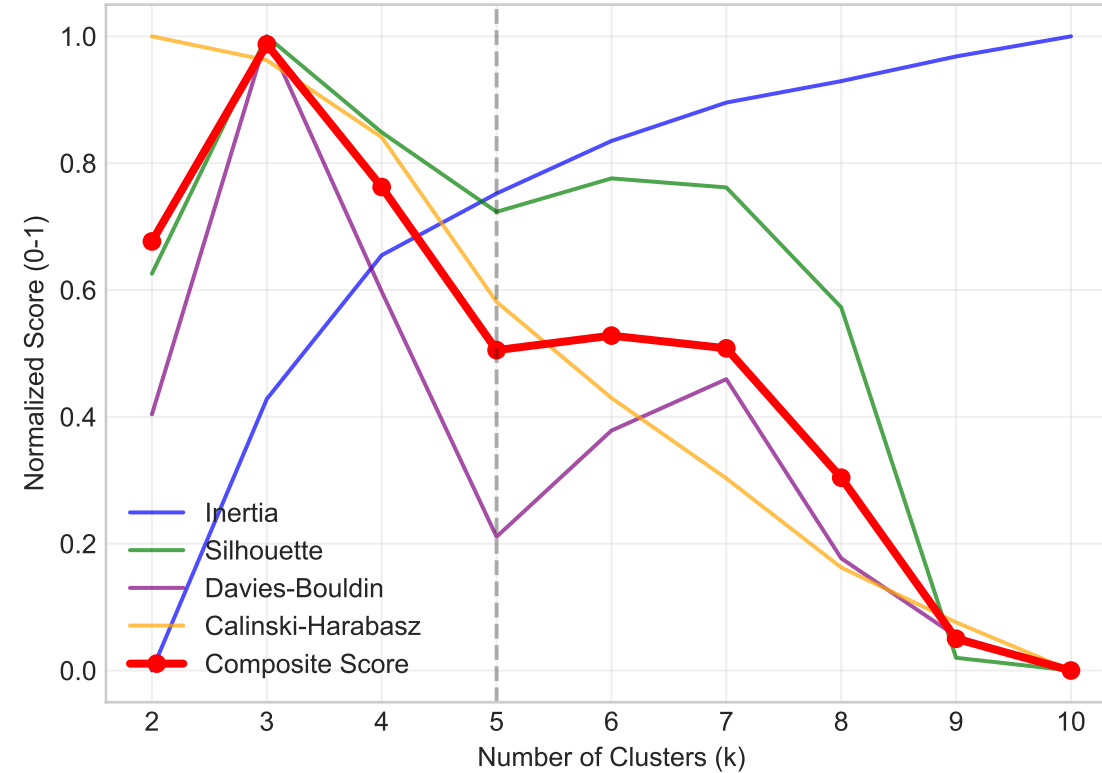
Davies-Bouldin Index (Lower is Better)



Calinski-Harabasz Index: Between-Cluster Variance



All Metrics Normalized: Consensus at k=5



OPTIMAL CLUSTERING ANALYSIS

Recommended k = 5

Metrics at k=5:

- Silhouette Score: 0.348
- Davies-Bouldin: 1.436
- Calinski-Harabasz: 4179

Why k=5?

- Clear elbow in inertia curve
- High silhouette score
- Low Davies-Bouldin index
- Matches business segments
- Interpretable personas

Business Segments Found:

1. Digital Natives (25%)
2. Traditional Savers (20%)
3. Business Users (15%)
4. International (10%)
5. Beginners (25%)