

# Task-3: Customer Segmentation / Clustering

## 1. Segmentation for Targeted Marketing:

Customers were grouped into four distinct clusters based on their shopping behaviors and spending habits. This segmentation empowers businesses to create tailored marketing campaigns, enabling them to effectively target specific customer segments.

## 2. Cluster Quality Assessment:

- a. **Davies-Bouldin Index (DB Index):** A value of 0.89 indicates that the clusters are well-separated.
- b. **Silhouette Score:** With a score of 0.62, this suggests that customers are appropriately grouped into their respective clusters.
- c. **Inertia:** A value of 150.32 reflects that the clusters are compact, with data points tightly grouped within each cluster.

## 3. Cluster Characteristics and Strategies:

- a. **Cluster 0:** Comprising high-value, frequent shoppers, this group generates significant revenue. To retain these customers, loyalty programs and exclusive offers should be prioritized.
- b. **Cluster 1:** Occasional shoppers who tend to spend more per order, preferring premium products. Target this group with campaigns featuring high-end products and exclusive promotions.
- c. **Cluster 2:** Moderate shoppers who respond positively to seasonal offers. To keep them engaged, seasonal discounts and promotions should be emphasized.
- d. **Cluster 3:** Infrequent, low-value customers. Re-engagement strategies such as special incentives or targeted email campaigns can help activate this group.

## 4. Visualization of Clusters:

Principal Component Analysis (PCA) was utilized to reduce the dimensionality of the data, allowing for an easy visualization of the clusters. The scatter plot confirms distinct separation between the clusters, further validating the clustering method used.

## 5. Actionable Recommendations:

- a. **Personalized Campaigns:** Leverage cluster insights to design personalized marketing efforts for each group.
- b. **Customer Retention:** Retain high-value customers (Cluster 0) by offering exclusive perks and loyalty rewards.
- c. **Upsell Opportunities:** Promote premium products to Cluster 1 customers to increase their purchase frequency.
- d. **Re-engagement of Low-Value Customers:** Focus on reactivating Cluster 3 with targeted offers and promotions.
- e. **Seasonal Engagement:** Keep Cluster 2 engaged by offering seasonal discounts that appeal to their shopping patterns.

## 6. Dynamic Model Updates:

The clustering model should be periodically updated with new customer data to ensure

the strategies remain relevant and aligned with the evolving customer behavior.

7. **Business Impact:**

This analysis provides a clear roadmap for improving customer retention, enhancing engagement, and increasing revenue by addressing the distinct needs of different customer segments.