

## **Business Insights Report (Clustering Analysis)**

### **Introduction**

The clustering analysis groups customers into segments based on their behavior and preferences. These segments help businesses understand distinct customer profiles, enabling targeted strategies for marketing, product development, and customer retention.

### **Key Findings from Clustering Analysis**

#### **1. Clustering Approach:**

##### **➤ Algorithm Used:**

1. K-Means clustering is applied to group customers into distinct segments.
2. The number of clusters is determined using the elbow method, which identifies the optimal point where adding more clusters does not significantly improve performance.

##### **➤ Key Metrics:**

1. Silhouette Score: Measures the cohesion and separation of clusters.

#### **2. Cluster Insights:**

##### **➤ High-Value Customers:**

1. These customers have high transaction values and frequent purchases.
2. Represent a small percentage of the total population but contribute significantly to revenue.

##### **➤ Budget-Conscious Customers:**

1. These customers make smaller, less frequent purchases but are consistent over time.

##### **➤ One-Time Buyers:**

1. Customers with only one or two transactions, often requiring re-engagement strategies.

#### **3. Visual Representation:**

##### **➤ Scatter Plots:**

1. Key features like transaction value and frequency are plotted to visualize cluster separations.