

# Customer Segmentation DataScience Project Report

## Objective:

The primary aim of this project is to categorize the company's customer base into distinct groups to enhance understanding of their behaviors and preferences. This segmentation helps tailor marketing strategies, improve customer satisfaction, and boost overall business performance.

## Project Overview:

1. **Data Collection and Cleaning:**
  - **Data Source:** ecom customer\_data.xlsx
  - **Data Cleaning Steps:**
    - Handle missing values.
    - Remove duplicates.
    - Convert categorical variables into numerical formats where necessary.
2. **Exploratory Data Analysis (EDA):**
  - Identify key patterns and trends in the data.
  - Visualize distributions, correlations, and outliers using histograms, scatter plots, and heatmaps.
3. **Clustering Algorithms:**
  - Apply clustering algorithms like K-means to segment customers based on selected features.
  - Determine the optimal number of clusters using methods like the elbow method and silhouette score.
4. **Validation:**
  - Validate the resulting segments for business relevance.
  - Ensure that each segment provides meaningful insights into customer behavior and preferences.
5. **Visualization:**
  - Present the segments through clear visualizations like scatter plots, bar charts, and 3D plots.
6. **Reporting:**
  - Deliver a detailed report with recommendations for personalized marketing strategies and product offerings for each segment.
  - Collaborate with stakeholders to implement these strategies and track their effectiveness.

## Key Features for Segmentation:

1. **Purchasing Behavior:**
  - Total purchase amount
  - Frequency of purchase
  - Recency of purchase
  - Average purchase value

- Types of products purchased
- 2. **Lifetime Value:**
  - Total revenue generated by the customer
  - Profit margin associated with the customer
  - Predicted future value of the customer
- 3. **Demographics:**
  - Age
  - Gender
  - Income level
  - Education level
  - Geographic location
- 4. **Preferences:**
  - Product categories of interest
  - Preferred communication channels
  - Response to promotions and discounts
  - Brand loyalty indicators
- 5. **Customer Engagement:**
  - Number of website visits
  - Duration of website visits
  - Interaction with marketing emails
  - Social media engagement
  - Customer service interactions
- 6. **Customer Feedback:**
  - Net Promoter Score (NPS)
  - Customer satisfaction ratings
  - Reviews and ratings on products/services

## **Detailed Report and Recommendations:**

### **Segment 1: Young High Spenders**

- **Characteristics:** Young age group, high annual income, high spending score.
- **Recommendations:** Focus on luxury products and exclusive experiences. Provide personalized marketing through preferred channels like social media and email.

### **Segment 2: Budget-Conscious Shoppers**

- **Characteristics:** Middle-aged group, low annual income, low spending score.
- **Recommendations:** Introduce budget-friendly products and promotional offers. Use email and SMS marketing to reach them.

### **Segment 3: Senior Value Seekers**

- **Characteristics:** Older age group, moderate annual income, moderate spending score.
- **Recommendations:** Provide personalized services and senior discounts. Engage through direct mail and customer service interactions.

### **Segment 4: Tech-Savvy Millennials**

- **Characteristics:** Young age group, high engagement with digital platforms.

- **Recommendations:** Enhance digital marketing strategies, offer online exclusives, and use social media campaigns to target this segment.

#### **Segment 5: Middle-Aged Loyalists**

- **Characteristics:** Middle-aged, high brand loyalty, moderate spending score.
- **Recommendations:** Implement loyalty programs and personalized offers to retain and increase their spending.