Customer Segmentation and Targeted Marketing Plan

1. Problem Statement

An online retail company wants to improve its marketing ROI by understanding customer behavior more effectively.
Currently, the company uses a uniform marketing strategy for all customers, which leads to poor engagement and wasted resources.
To solve this, the goal is to segment customers into meaningful groups based on their purchasing behavior, and design targeted marketing plans that suit each group's needs and preferences.

2. Objective

- To clean and analyze customer transaction data from the Online Retail dataset.
- To identify meaningful customer segments using K-Means clustering.
- To define customer personas based on purchasing patterns.
- To create personalized marketing strategies for each customer group.
- To improve marketing ROI through targeted communication.

3. Dataset Description

The dataset used in this project is the Online Retail II dataset fromKaggle.
It contains transactional data from a UK-based online store between 2009 and 2011.

Key Features:
- InvoiceNo – Unique invoice number for each transaction.
- StockCode – Product code.
- Description – Product name or description.
- Quantity – Number of items purchased.
- InvoiceDate – Date and time of the transaction.
- UnitPrice – Price per item.
- CustomerID – Unique customer identifier.
- Country – Country of the customer.

4. Data Cleaning and Preparation

Before analysis, the dataset was cleaned and prepared for modeling. Steps included:
- Combining both year sheets (2009–2010 and 2010–2011) into one dataset.

• Removing missing Customer IDs and duplicate entries.
• Filtering out negative quantities representing canceled orders.
• Creating a new feature called Total Amount = Quantity × UnitPrice.
• Converting InvoiceDate into proper datetime format.
• Retaining only valid, complete records for accurate segmentation.

5. Methodology

The project uses an unsupervised learning approach for segmentation.
Customers were analyzed using three main behavioral metrics derived from transaction history such as Recency, Frequency, and Monetary Value (RFM).

Steps followed:

1. Feature Engineering – Calculated Recency (days since last purchase), Frequency (number of purchases), and Monetary (total spending).
2. Feature Scaling – Standardized all RFM features to ensure equal weightage.
3. Clustering – Applied K-Means clustering algorithm. The optimal number of clusters (K=4) was determined using the Elbow Method.
4. Cluster Assignment – Each customer was assigned to one of four clusters based on similar purchasing patterns.

6. Results and Discussion

After applying K-Means, four clear customer clusters were identified based on Recency, Frequency, and Monetary patterns.
These clusters represent different levels of engagement and value to the business.

Cluster	Segment Name	Characteristics
0	Occasional Buyers	Purchase rarely with low spending and long gaps between orders.
1	Inactive Customers	Haven't purchased recently; low frequency and low spending.
2	Regular Customers	Buy moderately often with steady spending.

3	Loyal / High-Value Customers	Frequent purchases, high spending, most engaged.

Cluster visualization confirmed that these four groups have distinct behavior patterns in terms of purchase frequency, spending, and recency.

7. Customer Personas

Based on the clustering results, four main personas were defined:
• Loyal Customers – Frequent, high spenders who prefer premium services and exclusive offers.
• Regular Shoppers – Consistent buyers who value discounts and recommendations.
• Occasional Buyers – Buy irregularly, usually during promotions or reminders.
• Inactive Customers – Have not purchased for a long time and require re-engagement efforts.

8. Targeted Marketing Strategy

Customer Segment	Marketing Strategy	Goal
Loyal Customers	Offer loyalty rewards, early access, and VIP programs.	Retain top customers and boost repeat purchases.
Regular Shoppers	Provide reward points, discounts, and personalized product suggestions.	Increase spending and loyalty.
Occasional Buyers	Send reminder emails and 10–15% discount offers.	Encourage more frequent purchases.
Inactive Customers	Run win-back campaigns and reactivation offers.	Bring back lost customers.

9. Marketing ROI and Benefits

The segmentation-based marketing strategy provides multiple benefits:
• Improves targeting and conversion rates.
• Enhances marketing ROI by reducing wasted spending.
• Strengthens customer loyalty and retention.
• Enables personalized marketing campaigns for each segment.
• Helps prioritize resources for high-value customers.

10. Conclusion

This project demonstrates how customer segmentation using K-Means clustering can provide deep insights into consumer behavior.
By identifying four unique customer groups (Loyal, Regular, Occasional, and Inactive) the company can deliver personalized marketing that increases engagement and profitability.
The findings highlight how data-driven marketing improves ROI, retention, and long-term customer satisfaction.