Business Requirements Document (BRD)

Project Name	Customer Segmentation for retail store
Date Submitted	18-07-2024
Objectives	To segment customers into distinct groups based on their purchasing behavior.
Scope	Data cleaning, EDA, customer segmentation using K-Means, visualization using Matplotlib and Power BI.

Business Problem:
The retail store is currently facing a significant challenge due to a lack of understanding of the diverse customer profiles that shop at the mall. This lack of insight results in untargeted marketing strategies, which leads to inefficient marketing spend, low customer engagement, and suboptimal sales performance. Without a clear understanding of customer segments, the store cannot tailor its marketing campaigns to meet the specific needs and preferences of different customer groups, resulting in missed opportunities for growth and customer satisfaction.

Customers exhibit varying behaviors and preferences based on factors such as age, income, and shopping habits. The current one-size-fits-all approach fails to resonate with these diverse customer groups. As a result, marketing efforts are often wasted on uninterested customers, and potential high-value customers may feel neglected. This scenario highlights the urgent need for a systematic approach to segment customers and deliver personalized marketing strategies.

Business Objectives:
The primary objective of this project is to improve customer satisfaction and increase sales by gaining a deeper understanding of the various customer segments within the retail store. By identifying and analyzing distinct customer groups based on their purchasing behavior, the store can develop targeted marketing strategies that cater to the unique needs and preferences of each segment. This will enable more personalized and effective marketing campaigns, enhance customer loyalty, and ultimately drive higher sales and profitability.

Specific objectives include:

- **Identifying Key Customer Segments:** Understand the underlying characteristics and behaviors of different customer groups.
- **Enhancing Marketing Effectiveness:** Use segmentation insights to tailor marketing campaigns, ensuring they are relevant and engaging for each customer segment.
- **Increasing Customer Satisfaction:** Improve the shopping experience by addressing the unique needs and preferences of each customer group.
- **Boosting Sales and Profitability:** Drive sales growth through targeted promotions and offers that resonate with specific customer segments.
- **Optimizing Resource Allocation:** Allocate marketing resources more efficiently by focusing efforts on high-potential customer segments.

Functional Requirements:

Data Collection and Preparation:

1. **Data Collection:**
    - Collect customer data from the retail store's database, including customer demographics (age, gender), purchasing history, annual income, and spending scores.
    - Ensure data privacy and compliance with relevant regulations during the data collection process.
2. **Data Cleaning and Preprocessing:**
    - Clean the data by handling missing values, removing duplicates, and correcting inconsistencies to ensure data accuracy and completeness.
    - Normalize numerical features to ensure they are on a comparable scale, which is crucial for the clustering algorithm.

Exploratory Data Analysis (EDA):

1. **Understanding Data Distribution:**
    - Perform EDA to understand the distribution and characteristics of the data, including summary statistics and data visualization.
    - Identify key features and variables relevant to customer segmentation, such as spending behavior, frequency of visits, and customer demographics.
2. **Initial Insights:**
    - Use visualizations like histograms, scatter plots, and box plots to explore data patterns and relationships.
    - Formulate initial hypotheses about potential customer segments based on EDA findings.

Customer Segmentation:

1. **Clustering Algorithm:**
    - Apply clustering algorithms, specifically K-Means, to segment customers into distinct groups based on their purchasing behavior and other relevant attributes.
    - Determine the optimal number of clusters using methods such as the elbow method or silhouette score.
2. **Segment Validation and Interpretation:**
    - Validate the resulting customer segments to ensure they provide meaningful and actionable insights.
    - Interpret the characteristics of each segment to understand the unique traits and behaviors of customers within each group.

Visualization:

1. **Static Visualizations:**

    - Create visualizations using Matplotlib and Seaborn to represent the customer segments and their characteristics. This includes cluster profiles, segment distributions, and key differentiators.
2. **Interactive Dashboards:**
    - Develop interactive dashboards using Power BI to enable dynamic exploration of customer segments. These dashboards should allow users to filter and drill down into specific segments to gain deeper insights.

Non-functional Requirements:

Performance:

1. **Algorithm Efficiency:**
    - Ensure that the data processing and clustering algorithms run efficiently, even with large datasets, to provide timely insights.
    - Optimize the performance of the visualizations and dashboards to ensure they load quickly and respond smoothly to user interactions.
2. **Scalability:**
    - Design the solution to handle increasing amounts of data as the retail store collects more customer information over time. This includes ensuring that the clustering algorithm can scale to accommodate additional customer attributes and features.
    - Implement a scalable architecture that can support the addition of new data sources and integration with other business systems.
3. **Usability:**
    - Create an intuitive and user-friendly interface for the Power BI dashboards, allowing non-technical users to easily explore and interpret the customer segments.
    - Provide clear documentation and training materials to help users understand and utilize the segmentation insights effectively. This includes user guides, video tutorials, and FAQ sections.

By addressing these business and technical requirements, the project aims to deliver actionable insights that will enable the retail store to better understand its customers, optimize marketing efforts, and ultimately enhance customer satisfaction and sales performance. The successful implementation of this project will provide the retail store with a competitive edge by enabling more personalized and effective marketing strategies that resonate with diverse customer segments.