**Retail Analytics Case Study Report**

**Overview**

In the fast-paced and competitive retail industry, staying ahead requires a combination of innovation, customer-centric strategies, and operational efficiency. The use of data analytics has emerged as a key factor in driving business success. This case study focuses on a retail company that has faced challenges in terms of sales performance, customer engagement, and inventory management. Through a data-driven approach, this analysis aims to deliver actionable insights into product performance variability, customer segmentation, and customer behavior analysis, enabling the company to enhance its marketing strategies, optimize inventory, and improve customer satisfaction.

**Business Problem**

Over the past few quarters, the company has experienced stagnation in its growth trajectory and a decline in key customer engagement metrics. Initial assessments suggest that this may be due to inconsistent product performance, ineffective customer segmentation, and a lack of insights into purchasing patterns. The company has accumulated a wealth of data from sales transactions, customer profiles, and product inventory, which can be analyzed to identify and address the following key business problems:

**1. Product Performance Variability**

The company has noticed variations in sales performance across its product range. Understanding which products are performing well and which are underperforming is crucial for making informed inventory management decisions and guiding marketing efforts.

**2. Customer Segmentation**

Currently, the company lacks a clear segmentation of its customer base. Without this understanding, it is difficult to tailor marketing campaigns effectively or personalize customer experiences. Identifying distinct customer segments based on purchasing behavior will allow the company to target different groups with more relevant promotions and offers.

**3. Customer Behavior Analysis**

There is a need for deeper insights into customer purchasing patterns, including metrics such as repeat purchases and loyalty. Understanding customer behavior can help the company design better engagement strategies, ultimately improving retention and lifetime value.

**Objectives**

This case study seeks to use data analysis to address the following key objectives:

1. **Data Cleaning and Exploratory Data Analysis (EDA**): SQL queries will be employed to clean the data and conduct EDA, ensuring data quality and providing initial insights.

2. **Product Performance Analysis**: Identify high- and low-performing products to inform inventory management decisions and optimize marketing strategies for products that are not meeting sales expectations.

3. **Customer Segmentation**: Segment customers based on their purchasing behavior to design targeted marketing campaigns. The customer segments will be defined as follows based on the total quantity of products purchased:

- No Orders: Customers who have not made any purchases.

- Low: Customers who have purchased between 1 and 10 products.

- Mid: Customers who have purchased between 10 and 30 products.

- High Value: Customers who have purchased more than 30 products.

4. **Customer Behavior Analysis**: Analyze customer purchasing behavior, focusing on repeat purchases and loyalty indicators, to inform strategies for customer retention and engagement.

**Data Sources**

The analysis will draw on three key datasets:

**1. Sales Transaction Table**

- This table includes records of individual sales transactions and consists of the following columns:

- Transaction ID: A unique identifier for each transaction.

- Customer ID: Identifies the customer involved in the transaction.

- Product ID: Identifies the product purchased.

- Quantity Purchased: The number of units purchased in the transaction.

- Transaction Date: The date the transaction occurred.

- Price: The price at which the product was sold.

**2. Customer Profiles Table**

- This dataset contains information about the company’s customers, with the following fields:

- Customer ID: A unique identifier for each customer.

- Age: The customer’s age.

- Gender: The customer’s gender.

- Location: The geographical location of the customer.

- Join Date: The date the customer joined the company’s loyalty program or made their first purchase.

**3. Product Inventory Table**

- This table provides details about the company’s product inventory, including:

- Product ID: A unique identifier for each product.

- Product Name: The name of the product.

- Category: The product category (e.g., electronics, clothing).

- Stock Level: The number of units currently in stock.

- Price: The price of the product.

**Analysis Plan**

**1. Data Cleaning and Exploratory Data Analysis (EDA)**

The first step in this analysis is to ensure that the data is clean and ready for further analysis. This includes:

- Handling Missing Values: Ensuring there are no missing or incomplete records in key fields such as product ID, customer ID, and transaction date.

- Data Integrity: Verifying the accuracy of data, ensuring there are no duplicate records, and correcting any inconsistencies.

- Exploratory Analysis: Generating basic statistics such as total sales volume, average transaction value, and customer distribution to gain initial insights into the data.

**2. Product Performance Variability**

SQL queries will be used to calculate the total sales volume and revenue generated by each product. This analysis will involve:

- Identifying Best-Selling Products: Sorting products by sales quantity and revenue to identify the top-performing products.

- Identifying Underperforming Products: Identifying products with low sales volume or revenue and analyzing factors contributing to their poor performance (e.g., low stock levels, high prices).

- Product Recommendations: Based on these findings, recommendations will be made for adjusting inventory levels and launching marketing campaigns to promote underperforming products.

**3. Customer Segmentation**

Customers will be segmented based on their purchasing behavior, specifically the total quantity of products they have purchased. The segmentation will use the following categories:

- **No Orders**: Customers with no purchases.

- **Low**: Customers with 1-10 products purchased.

- **Mid**: Customers with 10-30 products purchased.

- **High Value**: Customers with more than 30 products purchased.

This segmentation will help the company design targeted marketing campaigns for different customer groups. For example:

- **No Orders Segment**: Encourage initial purchases through promotional offers or discounts.

- **Low Segment**: Increase customer spending through cross-selling or upselling strategies.

- **Mid Segment**: Reward these customers with loyalty programs to encourage repeat purchases.

- **High Value Segment**: Focus on customer retention through exclusive deals and personalized experiences.

**4. Customer Behavior Analysis**

To gain insights into customer loyalty and retention, the following analyses will be conducted:

- **Repeat Purchases**: Identify customers who have made multiple purchases over a defined period.

- **Average Purchase Frequency**: Calculate the average time between purchases to determine how often customers return.

- **Loyalty Indicators**: Look for patterns that indicate customer loyalty, such as consistent purchasing of certain product categories or high-value orders.

These insights will be used to develop strategies for increasing customer retention, such as personalized recommendations or loyalty rewards.

**Conclusion**

By analyzing product performance, customer segments, and purchasing behavior, the retail company can make informed decisions about inventory management, marketing strategies, and customer engagement. The insights gained from this data analysis will help the company address its challenges of stagnant growth and declining customer engagement, ultimately leading to improved sales performance and customer satisfaction.