

Customer Segmentation and Sales Analysis Report

1. Introduction

- **Objective:** The goal of this analysis is to segment the customer base of a retail company, identify sales trends, and provide actionable insights to improve the sales strategy. By using RFM (Recency, Frequency, Monetary) analysis and sales data trends, we aim to develop strategies that target key customer segments and optimize sales performance.

2. Data Cleaning

- **Dataset Overview:** The dataset contains sales records including columns such as Customer ID, Order Date, Product ID, Category, Region, Quantity, Unit Price, and Total Amount. The dataset initially consisted of 363 rows and 10 columns.
- **Data Preprocessing Steps:**
 - **Missing Values:** The dataset contained no missing values, so no imputation or removal was necessary.
 - **Date Format Standardization:** The Order Date column was standardized to a consistent date format (YYYY-MM-DD).
 - **Duplicate Records:** There were no duplicate records in the dataset.
- **Outcome:** After data cleaning, the dataset maintained 363 rows and 10 columns with no missing values, duplicates, and consistent date formats.

3. Customer Segmentation (RFM Analysis)

- **Methodology:** Customers were segmented using RFM analysis, categorizing them based on:
 - **Recency:** How recently a customer made a purchase.
 - **Frequency:** How often they made purchases.
 - **Monetary:** How much they spent in total.

	Customer ID	Recency	Frequency	Monetary
0	005612ec-5aea-48d6-9a6d-cdf0f538f4da	442	1	720.52
1	01329251-44d2-4ed4-b3cb-0d6b13a4712f	184	1	3356.50
2	015cda0c-7c05-45ab-8438-ac338a7db94c	511	1	1641.24
3	018c6e2c-9c84-45e1-991b-9310c5e174a5	254	1	2746.70
4	02167aaa-8387-4e7e-b1fe-30c87b9a52ed	386	1	2010.51

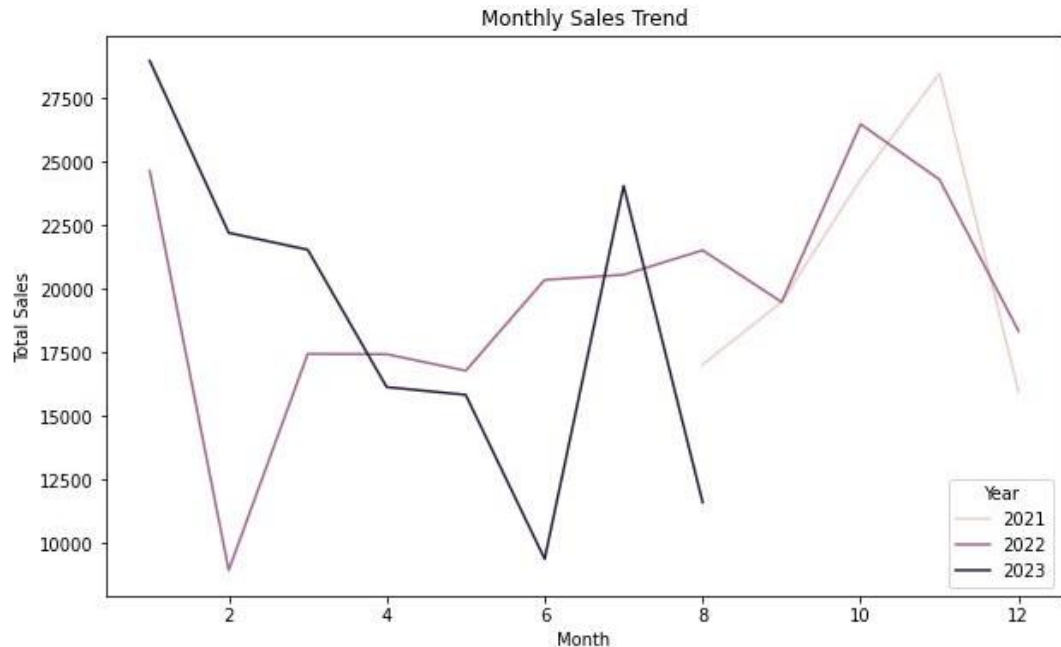
- **Key Customer Segments:**
 - **High-Value Customers:** These customers make frequent purchases and spend significantly.
 - **At-Risk Customers:** Customers who haven't made recent purchases and may be at risk of churning.
 - **New Customers:** Recently acquired customers with potential for growth.
- **Results:**
 - 25.07% of the customers are High-Value Customers, contributing **22.62%** of the total revenue.
 - **25.07%** of the customers are At-Risk, indicating the need for re-engagement strategies.
 - The rest of the customer base includes New Customers and lower-value segments.

	Customer ID	Recency	Frequency	Monetary	Recency_Segment	Frequency_Segment	Monetary_Segment	Customer_Segment
0	005612ec-5aea-48d6-9a6d-cdf0f538f4da	442	1	720.52	Low-Value	Low	Medium	RLow-Value-FLow-MMedium
1	01329251-44d2-4ed4-b3cb-0d6b13a4712f	184	1	3356.50	High-Value	Low	Very High	RHigh-Value-FLow-MVery High
2	015cda0c-7c05-45ab-8438-ac338a7db94c	511	1	1641.24	Low-Value	Low	High	RLow-Value-FLow-MHigh
3	018c6e2c-9c84-45e1-991b-9310c5e174a5	254	1	2746.70	Medium-Value	Low	Very High	RMedium-Value-FLow-MVery High
4	02167aaa-8387-4e7e-b1fe-30c87b9a52ed	386	1	2010.51	Low-Value	Low	High	RLow-Value-FLow-MHigh
5	02406387-f7f2-4721-93d8-f102e869c4b7	725	1	859.60	At-Risk	Low	Medium	RAt-Risk-FLow-MMedium
6	03693cb7-c0c4-4d76-9b8e-4326b964e2b6	645	1	3061.52	At-Risk	Low	Very High	RAt-Risk-FLow-MVery High
7	03e71c3f-6f5e-441b-971d-000721a0651d	366	1	196.39	Low-Value	Low	Low	RLow-Value-FLow-MLow
8	048dcc59-2b7a-4edb-8d7b-1b847411b658	458	1	3116.00	Low-Value	Low	Very High	RLow-Value-FLow-MVery High
9	04e780a1-dcff-4fc5-8f2a-7ed055f27220	600	1	2180.56	At-Risk	Low	Very High	RAt-Risk-FLow-MVery High

4. Sales Trend Analysis

- **Monthly and Yearly Sales Trends:**

- Sales trends show fluctuations throughout the year, with significant peaks observed during certain months. For example, sales peaked in **November**, contributing 10.91% of total yearly sales, likely due to holiday shopping.
- The lowest sales were recorded in **February**, contributing 6.05% of yearly sales, indicating an off-peak period.



- **Top Performing Product Categories:**

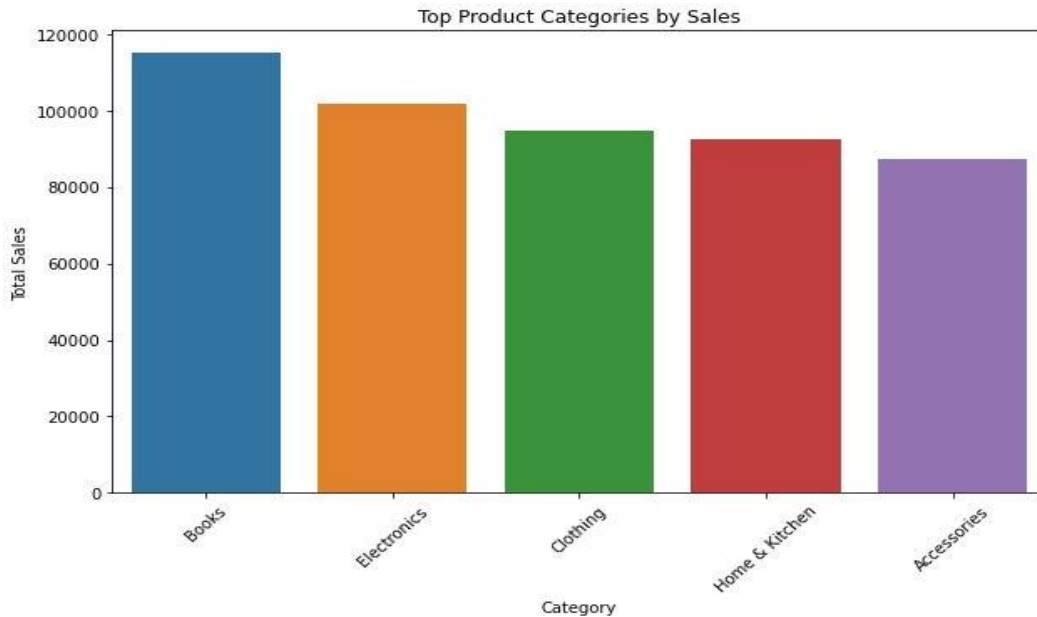
- The top-performing category was **Books**, contributing 23.43% of total sales, followed closely by **Electronics**. This category was consistently in demand across various regions, as shown in the bar chart.
- **Accessories** was the lowest-performing category among the top categories, contributing 17.79% of total sales, indicating a need for strategy adjustments in this category.

- **Regional Sales Distribution:**

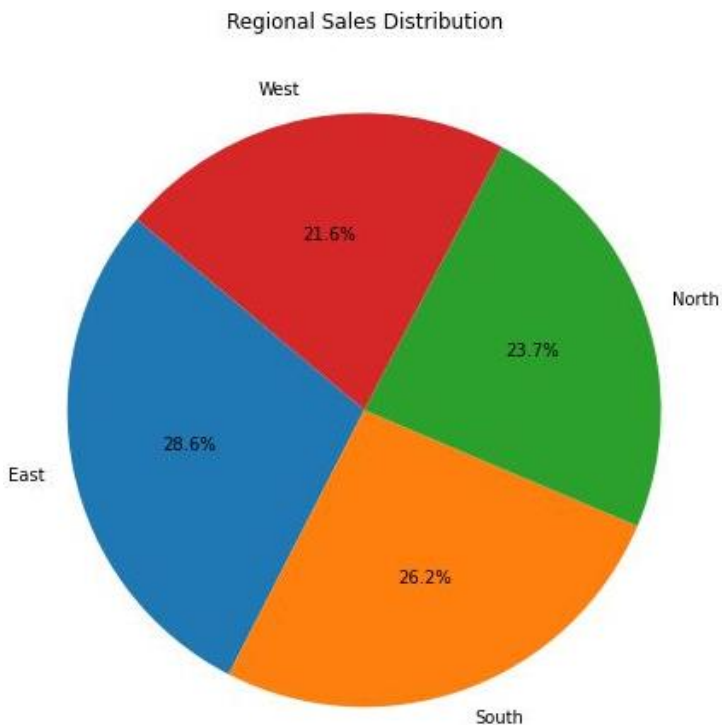
- The **East** region contributed the highest percentage of total sales, accounting for **28.6%** of total revenue, as depicted in the pie chart.
- The **West** region contributed the least, with **21.6%** of total sales, suggesting opportunities for growth in this area.

5. Data Visualization

- **Bar Chart for Top Product Categories:** A bar chart highlights the top-performing product categories, with **Books** leading the sales, followed by **Electronics**.



- **Pie Chart for Regional Sales:** The regional sales distribution is shown in a pie chart, with the **East** region having the largest share of sales at **28.6%**, while the **West** region has the smallest share at **21.6%**.



6. Recommendations

- **Targeting High-Value Customers:**
 - Implement loyalty programs and personalized offers to retain High-Value Customers. These customers are crucial as they contribute a significant portion of revenue despite being a smaller percentage of the customer base.
- **Engaging At-Risk Customers:**
 - Re-engagement campaigns, such as personalized emails or special discounts, should be used to encourage repeat purchases from At-Risk Customers. This segment presents a valuable opportunity for recovering lost sales.
- **Expanding Product Categories:**
 - Focus marketing efforts on top-performing categories like **Books** and **Electronics**. Additionally, consider expanding these categories by introducing complementary products.
 - For underperforming categories like **Accessories**, assess customer preferences and adjust marketing strategies to boost sales.
- **Optimizing Regional Sales:**
 - Increase inventory and tailor marketing campaigns for high-performing regions like the **East** to further boost revenue.
 - Focus on increasing brand presence and targeted promotions in lower-performing regions like the **West** to unlock growth potential.
- **General Sales Strategy:**
 - Align marketing and promotional efforts with peak sales periods, such as the holiday season, to maximize revenue during these times. Additionally, consider offering promotions during off-peak periods to boost sales.

7. Conclusion

- The analysis identified key customer segments and sales trends, providing actionable strategies for improving customer retention, optimizing product offerings, and boosting regional sales.
- By implementing these recommendations, the retail company can enhance overall sales performance, strengthen customer relationships, and explore growth opportunities in underperforming areas.