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TECHNICAL ASSESSMENT REPORT

FOR DATA SCIENTIST

Project Title: Customer Purchase Behaviour Analysis

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I. Introduction:

The Customer Purchase Behaviour Analysis project aims to provide a data-driven approach for enhancing the company's sales performance, customer retention, and marketing effectiveness. By analyzing customer transactions, marketing engagement, product details, and return data, the objective is to uncover key insights that can inform decision-making processes. The analysis focuses on identifying trends, patterns, and anomalies within the data, with the ultimate goal of optimizing revenue generation, improving repeat purchases, and streamlining inventory management. The insights derived from this analysis will empower the company to allocate resources more efficiently, drive growth, and improve overall profitability.

This report highlights the significant challenges the business is facing, such as the high proportion of new customers and low repeat purchases, along with the potential link between discounting strategies and increased return rates. Understanding the performance of various products and marketing channels is crucial for making informed decisions that not only enhance sales but also ensure that customer needs are met in a cost-effective manner. By focusing on actionable recommendations based on the data, the company can take steps to improve both customer satisfaction and financial outcomes, thereby strengthening its competitive position in the market.

Through the use of a comprehensive dashboard, real-time data visualizations, and strategic insights, this analysis presents a clear pathway for the business to optimize its operations and drive continued growth. The actionable insights provided will serve as a foundation for improving marketing strategies, product offerings, and customer engagement efforts, ultimately positioning the company for long-term success.

II. Problem Statement:

The company seeks to enhance its overall sales performance, customer retention, and marketing effectiveness by leveraging data-driven insights. The dataset provided includes customer transactions, marketing engagement, product details, and return data. However, the business faces several challenges, such as a high proportion of new customers, indicating low repeat purchases, and a potential correlation between discounting strategies and increased return rates. Additionally, understanding product performance is crucial to optimizing inventory management and ensuring that high-demand products remain in stock while underperforming products are addressed strategically. Furthermore, marketing efficiency plays a vital role in driving conversions, and it is essential to determine which channels contribute the most to revenue generation. The objective of this analysis is to identify trends, anomalies, and key factors influencing customer purchase behavior while providing actionable recommendations to increase revenue, improve customer retention, and optimize marketing spend, all while minimizing return rates and preventing inventory mismanagement.
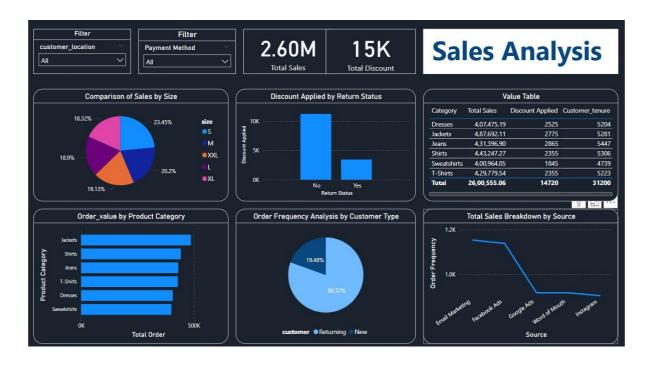
III. Objective:

The objective of this analysis is to derive actionable insights from customer transactions, marketing engagement, product details, and return data to enhance sales performance, customer retention, and marketing effectiveness. By identifying key trends, anomalies, and factors influencing purchase behavior, the goal is to optimize revenue generation, improve repeat purchases, and allocate marketing spend efficiently. Additionally, the analysis aims to assess product performance, minimize return rates, and enhance inventory management to prevent stockouts or overstocking, ultimately driving business growth and profitability. In addition to enhancing sales performance, customer retention, and marketing effectiveness, this analysis aims to:

- ➤ **Identify Customer Segments**: Understand distinct customer groups to tailor marketing efforts and product offerings.

- ➤ **Evaluate Discount Strategies**: Assess the impact of discounts on sales and returns, optimizing promotion efforts.

- ➤ **Improve Product Recommendations**: Leverage purchase history to deliver personalized product suggestions, increasing conversions.

- ➤ **Enhance Marketing ROI**: Evaluate the effectiveness of marketing channels to allocate resources more efficiently.

- ➤ **Reduce Customer Churn**: Identify early signs of churn and implement retention strategies.

- ➤ **Optimize Pricing Strategies**: Assess pricing's effect on sales and returns, ensuring competitive yet profitable pricing.

IV. Customer Insights Dashboard Analysis:

This dashboard provides a comprehensive view of key metrics and data visualizations, allowing users to interact with and analyze trends across various parameters. The intuitive interface displays real-time data, with charts, tables, and graphs that offer insights into performance, patterns, and anomalies. It serves as a powerful tool for decision-making, enabling users to track progress, monitor KPIs, and make data-driven choices efficiently.

V. Sales Analysis– Insights & Business Recommendations

1] Summary of Charts and Key Insights

This section provides a summary of the charts displayed on the dashboard, highlighting the key insights derived from the visualizations. It offers an overview of the data trends, patterns, and performance metrics to help guide decision-making. The insights presented are based on real-time data, aiming to provide a comprehensive understanding of the analyzed parameters.

1. **Total Sales & Discounts**

   - **Total Sales:** 2.60M
   - **Total Discount Applied:** 15K
   - A significant discount amount has been applied, which might be impacting the profitability.

2. **Comparison of Sales by Size (Pie Chart)**

   - **Top-Selling Sizes:**
     - M (23.45%)
     - XXL (20.2%)
     - L (19.13%)
   - **Least Popular Size:** S (18.32%)
   - **Actionable Insight:** Larger sizes (M, L, XXL) are selling more, so inventory should be optimized accordingly.

3. **Discount Applied by Return Status (Bar Chart)**

   - **Higher Returns are associated with Discounted Products.**
   - This suggests that customers are more likely to return products that had discounts, possibly due to **quality concerns** or **impulse purchases**.

4. **Value Table (Total Sales by Category)**

   - **Top-Selling Categories:**
     - **Jackets:** 4.87M

- **Shirts:** 4.43M
- **Jeans:** 4.31M
- **Lowest-Selling Category: T-Shirts (4.29M)**
- **Actionable Insight:**
  - Jackets and Shirts are the best-selling categories; focus marketing efforts on these products.
  - T-shirts have lower sales; consider discounts or promotions to boost sales.

5. **Order Value by Product Category (Bar Chart)**
   - **Jackets, Shirts, and Jeans are leading in total orders.**
   - **Sweatshirts and T-shirts have lower orders**, indicating potential low demand.

6. **Order Frequency Analysis by Customer Type (Pie Chart)**
   - **Returning Customers:** 19.48%
   - **New Customers:** 80.52%
   - **Actionable Insight:**
     - A high percentage of new customers suggests **low retention rates**.
     - Implement a **customer loyalty program** to encourage repeat purchases.

7. **Total Sales Breakdown by Source (Line Chart)**
   - **Most Effective Marketing Channel:** Email Marketing
   - **Least Effective Channels:** Instagram, Word of Mouth
   - **Actionable Insight:**
     - Invest more in **Email Marketing and Facebook Ads**, as they generate the most sales.
     - Improve engagement strategies for **Google Ads and Instagram**

2] Recommendations to Improve Business Performance

1. Improve Customer Retention

- **Implement a Loyalty Program**: Offer discounts or exclusive deals to returning customers.
- **Personalized Offers**: Use past purchase data to recommend relevant products via email.
- **Follow-up with Customers**: Use email/SMS reminders to encourage repeat purchases.

2. Optimize Inventory Management

- **Stock More of High-Selling Products** (Jackets, Shirts, Jeans) and reduce stock for low-selling categories.
- **Adjust Sizes Based on Demand**: Keep higher stock for **M, L, and XXL sizes**
- **Monitor Returns**: Identify which products have the highest return rates and improve quality.

3. Reduce Return Rate

- **Analyze Discounted Product Returns**: Offer discounts on selected, high-quality items only.
- **Improve Product Descriptions**: Ensure customers have a clear understanding of size, material, and features to reduce mismatches.

4. Enhance Marketing Strategy

- **Increase Investment in Email & Facebook Ads**: These channels drive the most conversions.
- **Improve Engagement on Instagram & Google Ads**: Use better creatives, influencer marketing, or A/B testing to improve performance.
- **Use Data-Driven Marketing**: Run promotions on high-performing categories (Jackets, Shirts).

VI. Conclusion

In conclusion, the Customer Purchase Behaviour Analysis has provided a comprehensive understanding of the company's sales dynamics, customer engagement, and marketing effectiveness. The key insights derived from the data highlight the importance of customer retention, product performance, and marketing channel optimization. By addressing the challenges related to new customer acquisition, discounting strategies, and high return rates, the company can implement strategies that not only increase repeat purchases but also ensure a smoother shopping experience for customers. With optimized inventory management, businesses can prevent stockouts and reduce overstocking, which would lead to a more efficient and cost-effective operation.

Additionally, refining marketing strategies by focusing on high-performing channels such as email marketing and Facebook Ads, and investing in improving engagement on platforms like Instagram and Google Ads, will allow the company to reach and convert more potential customers. The recommendations presented, based on data trends and customer insights, provide a roadmap for the company to enhance its overall performance. By continuing to leverage data analytics, the business can remain agile, adapt to evolving consumer preferences, and maintain a competitive edge in the marketplace, leading to sustained growth and profitability.