Supermarket Sales Performance Analytics

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Project Objectives

The project's primary objective is to develop an interactive sales performance dashboard using Power BI. This dashboard serves the following purposes:

- **Data Analysis**: Analyze sales data to uncover meaningful insights.
- **Data Visualization**: Create visually appealing and informative visualizations to represent sales data.
- **Interactivity**: Enable user interactivity within the dashboard to facilitate data exploration.
- **Decision Support**: Assist the supermarket in making data-driven decisions based on the insights derived from the dashboard

Work Completed

1. **Data Integration and Transformation**:
   - Collected and integrated data from various sources.
   - Cleaned and structured the data using Power Query Editor for analysis.
2. **Data Modeling and Analysis**:
   - Created a robust data model with defined relationships between datasets.
   - Conducted extensive analysis to extract insights regarding sales trends, customer segmentation, inventory management, pricing strategies, and more.
3. **Interactive Dashboards**:
   - Developed interactive dashboards using Power BI Desktop, focusing on user-friendly navigation and aesthetics.
   - Incorporated visuals, such as line charts, bar charts, scatter plots, pie charts, maps, histograms, and box plots.

Work Completed(contd.)

4. **Tooltips and Explanations**:
   - Implemented tooltips and explanations within the dashboard to provide context and insights to users, enhancing their understanding of the data
5. **Usability and Aesthetics**:
   - Focused on usability and aesthetics, fine-tuning layout, colors, fonts, and overall design elements
6. **Documentation**:
   - Created detailed documentation explaining how to use the dashboard effectively

Key Findings

- **Sales Trends**
- **Customer rating**
- **Customer type**
- **Geographic Performance**
- **Profitability Analysis**
- **Pricing Strategies**

Challenges Faced

1. **Design and Layout Iterations**:
   - Challenge: Achieving an optimal and user-friendly dashboard layout required multiple iterations.
   - Solution: Asked viewers questions, gathered feedback, and iteratively refined the design until it met user expectations.
2. **Limited Visual Variety**:
   - Challenge: The initial dashboard design lacked visual variety, making it less engaging for users.
   - Solution: To address this challenge, we expanded our visualization toolkit by exploring different chart types, custom visuals, and third-party integrations. This allowed us to present data in more engaging and informative ways
3. **Drill-Through Complexity**:
   - Challenge: Implementing drill-through functionality for detailed insights proved to be technically complex.
   - Solution: We approached this challenge by first defining clear hierarchies in our data model. Then, we carefully set up drill-through actions in Power BI, specifying which fields to drill through and configuring the visuals accordingly. Extensive testing ensured that drill-through worked smoothly for users

Insights and Decision-Making

- **Sum of Total Sales over a specific time period (from January 1, 2019, to March 30, 2019.)**

  Insight:

  - Total sales initially decreased by 5.44% but then significantly increased by 22.01% in a short time(18days), with the steepest jump occurring from $4,519.22 to $4,680.69 in January 2019.

  Decision-Making:

  - Investigate and address the reasons behind the initial sales decline, replicate successful strategies implemented in March 2019, and leverage past successful periods for future promotions to boost sales. Stay agile and adapt to market changes.

Insights and Decision-Making(Contd.)

- **Quantity of Product sold by Product Category(line)**

  Insights:

  - The key insight is that "Fashion accessories" consistently sold the highest quantity (178 units), 17.11% more than the lowest-selling category, "Health and beauty" (152 units). "Fashion accessories" accounted for 17.80% of total sales across all six product lines.

  Decision Implications:

  - Focus on maximizing the potential of "Fashion accessories" due to its popularity.
  - Investigate reasons behind lower sales in "Health and beauty" for potential improvements.
  - Maintain optimal inventory levels for "Fashion accessories.“
  - Consider conducting further analysis to understand customer preferences within the "Fashion accessories" category to tailor marketing efforts and promotions effectively

Insights and Decision-Making(Contd.)

- **Customer type**

  Insight:

  - The majority of customers fall under the "Member" category, representing 50.10% of the total customer count, while "Normal" customers make up the remaining 49.90%.

  Decision Making:

  - The supermarket can focus on enhancing benefits and rewards for "Member" customers to maintain their loyalty. Additionally, marketing strategies could be tailored to attract more "Normal" customers and balance the customer distribution for sustained growth

- **Gender distribution**

  - **Insight**: The data indicates a nearly equal gender distribution, with slightly more females (50.10%) than males (49.90%).
  - **Decision-Making**: This insight could guide marketing and product strategies to ensure gender-neutral appeal, potentially targeting specific products or promotions to each gender group while recognizing the importance of a balanced approach to cater to both male and female customers effectively.

Insights and Decision-Making(Contd.)

- **COGS vs. Gross Income**
  - **Insight**: Investigate the outliers to understand why they deviate. They may represent business opportunities or anomalies.
  - **Decision Implications**: Use the linear trend for pricing and cost management. Develop strategies for addressing outliers and ensure data quality for accurate analysis
- **Customer rating distribution**
  - **Insight:** The box and whisker plot of customer ratings suggest that the supermarket is generally providing a consistent and satisfactory experience for its customers
  - **Decision Implications**: Focus on maintaining and enhancing this level of customer satisfaction and leveraging positive ratings for competitive advantage.

Improvements and Future Enhancements

- **Real-Time Data Integration:**
  - Implement real-time or near-real-time data integration to provide decision-makers with the most up-to-date insights. This enhancement ensures that the dashboard reflects the latest sales, inventory, and customer data, enabling more timely decision-making and response to market changes.
- **Predictive Analytics**:
  - Incorporate predictive analytics models into the dashboard. Predictive models can provide valuable insights into future sales trends, demand forecasting, and inventory optimization. By leveraging predictive analytics, the supermarket can proactively plan inventory, promotions, and pricing strategies to maximize profitability

Improvements and Future Enhancements(Contd.)

- **User-Friendly Customization**:
  - Make it easy for users to customize reports. They can pick their own date ranges, choose the data they want to see, and apply filters that make sense to them. This way, users have the power to explore the data the way they like, helping them make better decisions.