

Supermarket Sales

1. Introduction

Background of the Project: The project involves analysing supermarket sales data from 2021 to derive actionable insights and improve business operations.

Objective of the Analysis: The primary objective is to clean and analyse the dataset to uncover trends, patterns, and insights that can aid decision-making. This includes creating visualisations and an interactive dashboard to present the findings effectively.

2. Dataset Description

Source of the Dataset: The dataset was sourced from a supermarket's sales records for the year 2021. ©IBM, ©Coursera

Overview of the Data: The dataset includes various attributes such as Invoice ID, Branch, City, Customer type, Gender, Product line, Unit price, Quantity, Tax, Total, Date, Time, Payment method, Cost of goods sold (COGS), Gross margin percentage, Gross income, and Rating.

3. Data Cleaning Process

Steps Taken for Data Cleaning:

- Removed duplicates to ensure data integrity.
- Handled missing values appropriately to avoid skewing the analysis.
- Corrected inconsistencies in data entry for accurate analysis.

Handling Missing Values and Outliers:

- Missing values were imputed using appropriate methods to maintain data completeness.
- Outliers were identified and treated to ensure they did not skew the analysis results.

4. Data Analysis

Methods and Tools Used:

- Excel was used for data cleaning, analysis, and visualisation.
- Pivot tables and formulas were utilised for in-depth analysis.

Key Findings from the Analysis:

- Sales distribution across different branches and cities.
- Customer purchasing behaviour based on type and gender.
- Performance of various product lines in terms of sales and customer ratings.
- Trends in sales over time.

5. Data Visualization

The visualisations created include:

- **Sale Trend Over Time:** This line chart shows the sales trend over the first three months of 2021. It helps in understanding the fluctuations in sales over time.
- **Sales by Product Line:** This bar chart compares the total sales for different product lines, such as Sports and Travel, Home and Lifestyle, Health and Beauty, etc.
- **Payment Method Distribution:** This pie chart shows the distribution of sales by different payment methods: Cash, Credit Card, and E-wallet. It helps in understanding customer payment preferences.
- **Customer Rating Distribution:** This bar chart illustrates the distribution of customer ratings, with an overlaid line chart showing the percentage distribution. It provides insights into customer satisfaction.
- **Product Line Trends:** This line chart shows the sales trends for different product lines over the first three months of 2021. It helps in understanding the performance of each product line over time.
- **Ratings vs. Sales:** This scatter plot shows the relationship between customer ratings and sales. It helps in understanding if higher ratings correlate with higher sales.

6. Interactive Dashboard



Features of the Dashboard:

- The dashboard integrates various visualisations to provide a comprehensive view of the data.
- Interactive elements allow users to filter and drill down into specific aspects of the data.

How to Use the Dashboard:

- Users can select different filters to view sales data by branch, city, customer type, product line, and time period.
- Hovering over charts provides detailed information about specific data points.

7. Insights and Recommendations

Insights Derived from the Dashboard:

- Branch A in Yangon has the highest sales.
- Female customers tend to have higher average ratings.
- E-wallet is the most popular payment method.

Actionable Recommendations:

- Focus marketing efforts on high-performing branches and product lines.
- Improve customer service based on feedback from ratings.
- Consider expanding payment options to cater to customer preferences.

8. Conclusion

Summary of Findings: The analysis provided valuable insights into sales performance, customer behaviour, and product line success. The visualisations and dashboard effectively present these insights, making it easier to understand and act upon them.

Future Work or Suggestions:

- Conduct further analysis to understand the factors influencing customer ratings.
- Explore additional data sources to gain a more holistic view of sales performance.
- Regularly update the dashboard with new data to monitor trends over time.