**Sales Performance Dashboard using Power BI**

Team 4

Project Documentation

Infosys Springboard Internship 5.0

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Author Note

Complete documentation for the tasks performed under the guidance of mentor Pavithra

Abstract

This document details the creation and implementation of a Sales Performance Analysis Dashboard using Power BI. Designed to consolidate and visualize essential sales data, the dashboard offers insights into customer segments, product trends, and customer satisfaction. By leveraging DAX calculations and Power BI's interactive features, the project aims to enhance strategic decision-making by identifying key customer segments, top-performing products, and sales trends. The report also highlights data transformation processes, calculated metrics, and proposes future enhancements, including geographical segmentation and churn prediction.

Keywords: PowerBi, DAX, Visualizations, Decision Making.

Introduction

In today's dynamic business environment, effective decision-making is essential for maintaining a competitive edge and driving growth. Business Intelligence (BI) plays a pivotal role by transforming raw data into actionable insights, enabling businesses to track performance, recognize trends, and adapt proactively to market changes. This project focuses on analyzing sales performance using BI tools and DAX calculations within Power BI, offering a structured framework for data-driven decision-making.

The dataset includes key attributes such as invoice details, client profiles, product categories, sales metrics, and customer satisfaction ratings. Through comprehensive analysis of these data points, the project seeks to reveal patterns that support strategic business decisions, enhance organizational agility, and optimize sales outcomes.

# Project Objective and Outcome

Business Intelligence can be defined as a solution which facilitates companies to make an intelligent decision in business processes. It can be a service to effectively organize and transform data into information, which is a knowledge basis in decision-making. With the help of an appropriate business intelligence solution, a company can play an active role in timely monitoring business performance, quickly responding to external business environment.

The process of information delivery becomes smoother between visualized data and users than before. By viewing sales dashboard, users can clarify sales performance in current month. Moreover, the empirical steps specified in this thesis can provide a guide for the department to follow and improve in the future.

## 1. Module: Data Preparation

***1.1 Data Description***

This dataset showcases the sales of a venture in the European region in different categories from March 2023 till October 2024.

The dataset comprises the following columns that provide a comprehensive view of the sales process and customer interactions:

* **Basic Details:** Invoice Number, Shipping Type, Order Date, Delivery Date, Payment Method.
* **Client Information:** Client Code, Client Name, Client Segment, Location, Country, Region, Zip Code.
* **Product Information:** Product Code, Product Category, Product Description, Warranty.
* **Sales Metrics**: Sale Amount, Quantity, Discount Rate, Profit Margin, Unit Price. Customer **Feedback:** Customer Rating, Product Return Status, Customer Loyalty Program.
* **Marketing:** Sales Channel, Marketing Campaign Code.

***1.2 Data Cleaning and Transformation***

The following steps were taken for data cleaning the data: -

* Changed data type of order to date complexity.
* Sorted rows according to order date for better understanding.
* Removed irrelevant rows from the dataset.
* Used first row as headers.
* Removed irrelevant columns from the dataset.
* Introduced columns such as :-
  + Actual Cost = [Sale Amount] - [Profit Margin]
  + Customer Satisfaction = IF([Customer Rating] = 5, "Excellent", IF([Customer Rating] = 4, "Good", "Average"))
  + Discount = [Sale Amount] \* [Discount Rate]
  + Unit Price = [Sale Amount] / [Quantity]
  + Average Order Value =([Total Sale]/[Quantity])
  + Total Sale = ([Quantity]\*[Sale Amount])

***1.3 Dax Measures***

To analyze various aspects of sales performance, the following DAX measures were created:-

* **Sales % by Category** = DIVIDE ([Total Sales], CALCULATE ([Total Sales], ALL ([Product Category])))
* **Sales By Channel** = CALCULATE (SUM ([Sale Amount]), ALLEXCEPT ([Sales Channel]))
* **Sales By Region** = CALCULATE (SUM ([Sale Amount]), ALLEXCEPT([Region]))
* **Sales Per Client** = DIVIDE ([Total Sales], [Client Count])
* **Total Discount** = SUMX ([Sale Amount] \* [Discount Rate])
* **Total Sales** = SUM ([Sale Amount])
* **Total Units Sold** = SUM ([Quantity])
* **Total Cost** = SUM ([Actual Cost])
* **Total Sales by Category** = CALCULATE (SUM ([Sale Amount]), ALLEXCEPT ([Product Category]))
* **Non-Return Count** = COUNTROWS (FILTER ([Product Return Status] = "No Return"))
* **Gross Profit Margin** = DIVIDE ([Gross Profit], [Total Sales])
* **Gross Profit** = SUM ([Profit Margin])
* **Client Count** = DISTINCTCOUNT ([Client Code])
* **Average Unit Price** = AVERAGEX ([Unit Price])
* **Average Sales per Order** = AVERAGEX ([Sale Amount])

## 2. Module: Basic Visualizations

***2.1 Sales Performance Metrics (KPI/Cards)***

They represent crucial metrics for evaluating sales performance, such as

1. Total Units Sold
2. Average Sales per Order
3. Sales Percentage
4. Sale Amount
5. Profit
6. Discount
7. Return Count
8. Non-Return Count

***2.2 Pie Chart***

A pie chart was created showcasing sales across different product categories which concluded: -

* **Automative Parts** contribute 25.92% (304.1K), ranking second.
* **Wearable Tech** lead with 22.04% (258.52K).

***2.3 Donut Chart***

A donut chart was created showcasing sales across different sales channels which concluded: -

* **Online Channel** dominates with 40.99% (480.86K).

***2.4 Line and Clustered Column Chart***

A line and clustered column chart was created for sales across channels and product categories which concluded: -

* **Top Performer:** Automotive Parts with the highest quantity sold, driven by In-Store sales.
* **Profit Margin:** Peaks in Automotive Parts because of **discount is less,** declines in Wearable Tech due to **high in discount,** but recovery in Home Decor.

## 3. Module: Advanced Visualizations and Analysis

***3.1 Geographical Analysis***

Geographical analysis was done using **line and clustered column chart**, **stacked bar chart**, **waterfall chart** and **map**, which concluded the following: -

1. **Sales performance:**
   * Top-performing countries in profit: Italy and France
   * Top-performing countries in sales: Italy and Netherlands
   * Italy and Germany: Highest average sales per order with moderate returns.
   * France: Low average sales but significantly high Returns Count.
   * Germany: Negative margin in several categories, requiring corrective measures.
2. **Recommendations:**
   * Italy is the most profitable and balanced market
   * Germany needs margin improvement, focusing on underperforming categories.
   * Reduce returns in France to boost efficiency and profitability.

***3.2 Trend Analysis***

Trend analysis was done using **line and clustered column chart**, **ribbon chart**, **line** **chart** and **area chart**, which concluded the following: -

* 1. **Monthly and Quarterly Trends:**
     1. Quarter 3 peaked in sales nearly 190K and profit nearly 70K but showed a decline in Quarter 4.
  2. **Sales Channels:**
     1. In-store dominated throughout the year, wholesale dominated in August and September with over 900 units sold.
  3. **Profit vs. Discounts:**
     1. Higher discounts negatively impacted profit.
     2. A balance between the two is critical for profitability.
  4. **Performance by Month:**
     1. Significant sales spikes in September (peak sales units)
     2. and profit drops by November.

***3.3 Customer Segmentation Analysis***

Trend analysis was done using **stacked column chart**, **treemap**, **stacked bar** **chart**, **scatter chart** and **line and clustered column chart,** which concluded the following: -

* 1. **Customer Satisfaction Analysis:**

The “Average" satisfaction level contributes the most to profit margin (140K).

* 1. **Sales Channel Insights:**

Online channels outperform Instore and Wholesale channels in profit margins.

* 1. **Product Category Trends:**

Automotive and Fitness categories lead in sales across Client Segments.

Discounts are higher for Retail Partners, affecting profit margins.

***3.4 Top Performance Analysis***

Top performance analysis was done using **stacked column chart**, **treemap**, **stacked bar** **chart** and **line and clustered column chart,** which concluded the following: -

* **Profit Margin vs. Customer Rating:** The highest profit margin is observed for customers with a rating of 1, 3 and 2, while ratings 4 and 5 contribute less to profitability.
* **Top Performing Products:** Products like PD-4429 and PD-3314 generate the highest profit margins, while PD-3882 and PD-3610 lead in sales volume.
* **Profit Margin by Client:** Clients CL-3909 and CL-7191 contribute the most to profit margins, showing strong business value.
* **Sales by Client:** Sales are evenly distributed among top clients, with CL-3107 leading slightly.

***3.5 Customer Profitability Analysis***

Customer profitability analysis was done using **a scatter chart,** which concluded the following: -

* **Bronze Loyalty Program:** Achieves the highest profit margin, indicating highly profitable customer engagements despite relatively fewer sales per client.
* **Diamond and Gold Programs:** Show a balance with higher sales per client and profit margins, highlighting strong customer spending and profitability.

***3.6 Customer Loyalty Program Analysis***

Customer loyalty program analysis was done using **stacked column chart** and **line and clustered column chart,** which concluded the following: -

* + **Unit Price Analysis:**

Diamond and Gold tiers lead with the highest unit prices (over 100K).

* + **Sales and Metrics Overview:**
    1. **Diamond Tier:** Highest Sales Amount (0.3M) but lowest Profit Margin due to discount.
    2. **Bronze Tier:** Best Profit Margin increases compared to diamond but still discount is high.

***3.7 Average Sales Per Order by Customer Loyalty Program***

Average Sales Per Order byCustomer loyalty program analysis was done using **stacked column chart** and **line and clustered column chart,** which concluded the following: -

* + **Best Performing Programs:**
    1. **Gold and Diamond:** Highest average sales per order with highest average customer satisfaction. Mixed satisfaction but good sales performance.
    2. **Bronze:** Moderate sales with varied satisfaction levels.
  + **Underperforming Programs:**
    1. **Platinum:** Average satisfaction and weak sales performance.

***3.8 Payment Method Analysis***

Payment method analysis was done using a **stacked bar chart**, which concluded the following: -

* + **Bank Transfer**: Highest Sales Amount (~0.6M) and Discounts, but moderate Profit Margin.
  + **Credit Card**: Balanced Sales (~0.4M) and Profit Margin, with notable discounts.
  + **Cash**: Moderate Sales with a good Profit Margin.

***3.9 Target Sales Analysis***

Target sales analysis was done using **gauges**, which concluded the following: -

* **Sales Performance:** Achieved sales amount is 1.22M against a target of 1.46M.
* **Profit Performance:** Generated profit is 213.14K with a target of 255.77KK.
* **Progress Tracking:** Both sales and profits are progressing but are currently below the targets set.

***3.10 Key Influencers***

It was done using **key influencers**, which concluded the following: -

Sales amount is influenced by:

* **Profit Margin:** Increases in sales are more likely when the profit margin is 40.5 or less.
* **Quantity:** Sales amount tends to increase when the quantity is between 3 to 4 units
* **Discount:** Higher sales are associated with discounts above 185.03.

***3.11 Profit Margin Breakdown***

Profit margin breakdown was done using **decomposition tree**, which concluded the following: -

* E-commerce contributes the highest profit margin, followed by Retail Partner.
* Online sales channel has the highest profit within E-commerce, while Wholesale and In-Store follow.

## 4. Module: Future Enhancements and Conclusion

***4.1 Future Enhancements***

These enhancements are actionable, innovative, focusing on cutting-edge BI solutions and targeted strategies for improved sales performance.

1. **Advanced Analytical Capabilities**

* **Dynamic Sales Target Adjustment**: Implement AI-driven dynamic targets that adjust based on seasonality, economic factors, and competitor pricing.
* **Cross-Sell and Upsell Opportunities**: Use association rule mining (e.g., Apriori algorithm) to identify product combinations frequently purchased together and recommend upsell opportunities.

1. **Customer-Centric Strategies**

* **Real-Time Customer Experience Monitoring**: Develop dashboards to track customer sentiment in real-time using sentiment analysis from live feedback or social media mentions.
* **Customer Journey Mapping**: Analyze customer pathways across channels to identify bottlenecks and improve engagement strategies.

1. **Profitability Enhancements**

* **Profit Heatmap**: Create regional profitability heatmaps segmented by product category and sales channel to target high-margin areas.
* **Discount Elasticity Analysis**: Conduct experiments to understand how discount levels influence sales volume and profit margins, enabling smarter pricing strategies.

1. **Operational and Reporting Improvements**

* **Automated Anomaly Detection**: Deploy machine learning models to flag unusual sales trends or outliers in real-time.
* **Mobile-Friendly Dashboards**: Develop responsive, mobile-optimized dashboards for on-the-go performance tracking.

1. **Strategic Expansion and Innovation**

* **Global Market Simulation**: Use simulation models to predict potential performance in new international markets based on historical data.
* **Omnichannel Sales Integration**: Implement advanced tracking for omnichannel performance to unify in-store, online, and wholesale data streams for a single customer view.

***4.2 Conclusion***

The Sales Performance Analysis project showcases the power of Business Intelligence in enabling data-driven decision-making. By implementing targeted DAX measures and exploring insightful metrics, this project lays the foundation for ongoing improvements in sales strategies, customer experience, and profit margins. Future analyses focusing on predictive modelling and customer retention will further amplify the business’s responsiveness and agility in a dynamic market environment.