📊 Power BI Dashboard Project

PLANTCO SALES & OPERATIONS ANALYSIS

Objective:

To build an interactive Power BI dashboard to evaluate sales trends, operational metrics, and gross profit insights using the PlantCo dataset.

Key Focus:

- Year-to-Date (YTD) & PYTD Analysis
- Gross Profit (GP%) Trends
- Interactive Visualizations (Bar, Tree Map, Scatter)
- DAX Calculations & Data Modeling

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ABSTRACT

This project aims to design a Power BI dashboard to evaluate operational and sales performance using the Plant dataset. The dataset likely contains information on production metrics, time-based trends, and key performance indicators. Drawing inspiration from the YouTube video, the project leverages Power BI's capabilities for data analysis, visualization, and processing to uncover valuable insights. The dashboard will provide a clear overview of performance metrics, enabling better decision-making and identifying areas for improvement. By analyzing trends and patterns, it will help optimize operations and boost overall efficiency.

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Introduction

Understanding and using data effectively is essential for businesses today. This project focuses on using Microsoft Power BI to build an interactive and easy-to-use dashboard based on the Plants dataset. The main purpose is to analyze operational and sales performance, making complex data simple and actionable. By organizing, modeling, and visualizing data, this project helps turn raw numbers into clear insights. It also demonstrates how Power BI can be a valuable tool for solving real-world business challenges and improving decision-making.

Objective:

- Import and clean the Plant_DTS dataset to ensure data accuracy and consistency.
- Organize raw data into a structured format for effective analysis.
- Create relationships between tables to build a unified data model.
- Optimize the data structure to enable efficient queries and analysis in Power BI.
- Build an interactive Power BI dashboard to showcase key metrics and trends.
- Display operational performance metrics such as production rates, downtime, and efficiency.
- Include visuals for sales performance, highlighting revenue, customer insights, and sales trends.
- Use DAX (Data Analysis Expressions) to create custom calculations and insights.
- Detect patterns, anomalies, and correlations in the data to draw actionable conclusions.
- Provide stakeholders with an interactive reporting tool for performance monitoring.
- Facilitate data-driven decision-making to enhance operational efficiency and profitability.
- Apply theoretical knowledge from the video to analyze a real-world dataset.
- Improve expertise in Power BI, focusing on data transformation, visualization, and report creation.

Dataset description:

The Plant_DTS dataset is the core of this project, containing crucial information about plant operations and sales performance. It includes the following data categories:

Production Metrics: Details on production rates, efficiency, and downtime.

Sales Data: Information on revenue, customer segmentation, and sales trends.

Time-Series Data: Insights across different time intervals.

Key Performance Indicators (KPIs): Metrics used to track and evaluate the effectiveness of operational strategies.

The dataset has been cleaned and transformed to ensure accuracy and consistency, making it ready for detailed analysis in Power BI.

Calculations:

YTD (Year-to-Date): This refers to the period starting from the beginning of the current calendar year up to the present date. YTD is commonly used to measure performance or financial metrics over this time frame.

PYTD (Previous Year-to-Date): This is similar to YTD; it measures the same period from the previous year.

Gross Product: This typically refers to Gross Domestic Product (GDP) in economic terms, which is the total value of all goods and services produced within a country in a specific period, usually a year or a quarter.

Gross Profit: This helps businesses determine how efficiently they are producing and selling their products. A higher gross profit indicates that the company is managing its production costs effectively.

DAX:

1. Date:

```
Dim_Date = CALENDAR(DATE(2022, 01, 01), DATE(2024, 12, 31))
```

2. For Year to Date:

```
s_YTD =
VAR selected_value = SELECTEDVALUE(Slc_values[Values])
VAR result = SWITCH(selected_value,
"Sales", [YTD_Sales],
"Quantity", [YTD_Quantity],
"Gross Profit", [YTD_GrossProfit],
BLANK()
)
RETURN
result
```

3. For Previous Year to Date:

```
sw_PYTD =
VAR selected_value = SELECTEDVALUE(Slc_values[Values])
VAR result = SWITCH(selected_value,
"Sales", [PYTD_Sales],
"Quantity", [PYTD_Quantity],
"Gross Profit", [PYTD_GrossProfit],
BLANK()
)
RETURN
Result
```

4. For GP:

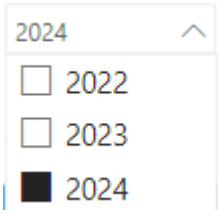
GP = DIVIDE([Gprft], [Sales])

5. For comparasion

YTD vs PYTD = [S_YTD] - [S_PYTD]

Analysis:

Visual 1:



Description:

Dates are crucial in Power BI for performing time-based analysis, enabling advanced calculations, organizing data, and creating meaningful visualizations that provide insights over time.

Visual 2:

Description:

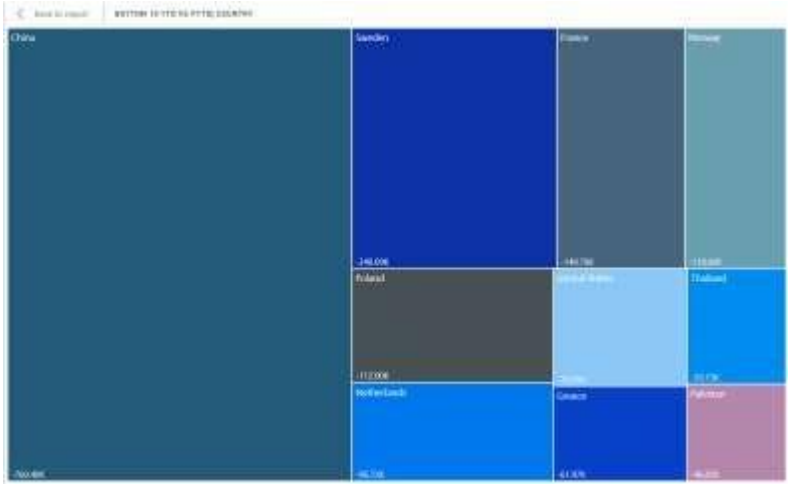
This slicer allows to select between Sales, Gross Profit, or Quantity. Based on the selection, the graph dynamically updates to show the analysis of the chosen metric. Currently Sales is selected, the data analysis will appear accordingly.

Visual 3:

Description:

This visual displays YTD (Year-to-Date), PYTD (Previous Year-to-Date), GP% (Gross Profit Percentage), and the difference between YTD and PYTD based on the selected slicer data. It provides an overview of current year performance, compares it with the same period from the previous year, and shows the gross profit percentage, along with the variation between the two time periods.

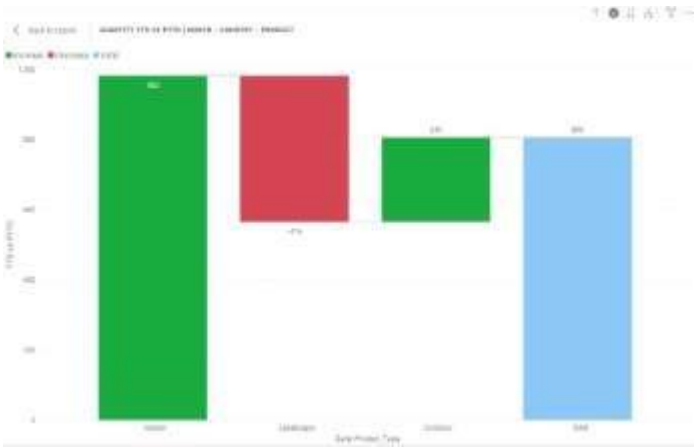
Visual 4:



Description:

This treemap displays the bottom 10 countries based on their Year-to-Date (YTD) compared to Prior Year-to-Date (PYTD) values. Each rectangle represents a country, with the size corresponding to its rank among the bottom 10. The data in left bottom corner of rectangles shows the values going up or down.

Visual 5:



Description:

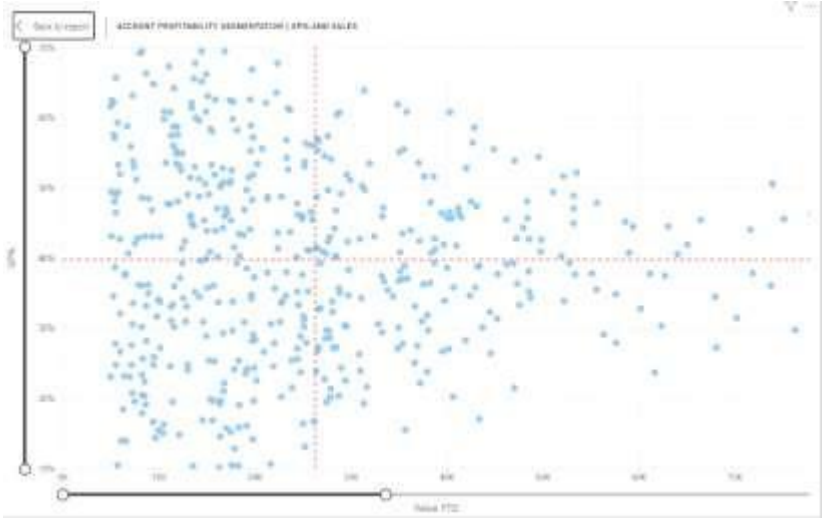
This bar chart compares Year-To-Date (YTD) sales with Prior Year-To-Date (PYTD) sales across months, highlighting periods of growth and decline. It shows how sales performance has changed from month to month, with some months experiencing increases while others show decreases. By selecting on the downside arrow (top right) and then clicking on the any month to see the country progress and click on any country to see it's the specific data.

Visual 6:

Description:

This graph combines a stacked column chart and a line chart to compare YTD and PYTD sales over four months. The stacked columns show sales by product type Indoor, Landscape, and Outdoor, while the red line represents PYTD values. By clicking on any specific quarter, data in months will be displayed.

Visual 7:



Description:

This scatter plot visualizes the relationship between Gross Profit Percentage (GP%) and sales value, segmented by account profitability. Each dot represents an individual account or sale, plotted according to its GP% and YTD value. The chart includes red lines dividing the graph into four quadrants: high GP% with high sales, high GP% with low sales, low GP% with high sales, and low GP% with low sales. Outlier are shown specifically.

Conclusion

This project created a Power BI dashboard to analyze and visualize operational and sales performance using the Plants dataset. The dashboard enables easy tracking of key metrics like sales, gross profit percentage (GP%), and comparisons between current performance and the previous year. By using DAX formulas, the dashboard was made interactive, allowing users to select different metrics like sales, quantity, or gross profit to view their performance. Visualizations such as tree maps, scatter plots, and bar charts were used to display trends, identify issues, and highlight areas for improvement. This project demonstrates how Power BI can assist businesses in making better decisions by converting data into clear insights. It helps identify areas of success or areas needing attention, leading to more informed business decisions and increased profitability.

References:

- https://www.youtube.com/watch?v=BLxW9ZSuuVI
- https://github.com/mochen862/power-bi-portfolio-project/tree/main?search=1