

POWER BI PROJECT REPORT:

FINANCE DATASET ANALYSIS

NAME:

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INTERNSHIP

This project was developed during my internship as a Power BI Intern at Infosys. The internship provided hands-on experience in business intelligence tools, focusing on creating interactive dashboards, utilizing advanced DAX measures, and deriving actionable insights from data.

OBJECTIVE

This report provides a comprehensive guide to creating a Power BI solution for analyzing the financial dataset. The project focuses on leveraging a star schema model, importing and transforming data, defining relationships, and implementing DAX (Data Analysis Expressions) measures to derive actionable insights into sales performance, profit margins, and financial trends.

ABSTRACT

The development process began with data preparation using Power Query. This involved cleaning and shaping the raw dataset to ensure accuracy and consistency, which are critical for reliable analysis. Steps included handling missing values, standardizing column names, and verifying data types for fields like sales, costs, and dates. These transformations not only enhanced data integrity but also prepared the dataset for efficient modeling and querying.

The next phase of the project focused on data modeling, where a star schema structure was implemented to optimize data storage and querying efficiency. This involved creating a fact table for transactional data and linking it to dimension tables such as regions, products, and dates using primary and foreign key relationships. These relationships facilitated seamless aggregation and filtering across dimensions, enabling users to drill down into specific areas of interest within the dataset. The project also utilized DAX (Data Analysis Expressions) to define advanced calculations and key performance indicators (KPIs). Custom measures were developed to calculate metrics like gross sales, net sales, cost of goods sold (COGS), and total profit. DAX was further employed for dynamic calculations such as year-over-year growth, profit segmentation, and customer lifetime value, enhancing the depth and flexibility of the analysis. These measures were instrumental in capturing trends and uncovering patterns that might not have been immediately visible.

The project culminated in the design of an interactive Power BI dashboard that effectively brings the financial insights to life. By leveraging Power BI's robust visualization capabilities, the dashboard integrates line charts, bar charts, KPIs, and slicers to enable dynamic exploration of the data. Users can interact with the visuals to filter by region, product category, or time period, offering a tailored view of the data that aligns with specific business needs. This project demonstrates the end-to-end process of building a comprehensive BI solution, showcasing how Power BI's features—Power Query for data preparation, DAX for advanced calculations, and powerful visualization tools.

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1. INTRODUCTION

In today's competitive environment, financial data analysis is critical for informed decision-making. Power BI, as a leading business intelligence tool, enables users to transform raw data into actionable insights through dynamic dashboards and advanced calculations. This project leverages Power BI to analyze a financial dataset focusing on sales, costs, profits, and trends, while demonstrating its powerful modeling and visualization capabilities.

2. OBJECTIVE

The key objectives of this project are to:

1. Create an interactive Power BI dashboard that visualizes financial data and trends.
 2. Utilize a star schema model to enhance data storage and querying efficiency.
 3. Implement advanced DAX measures to calculate metrics such as profit, sales, and customer-specific insights.
 4. Enable stakeholders to make data-driven decisions through actionable insights.
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3. DATA SOURCE

The dataset analyzed in this project includes:

- **Transaction Data:** Records of sales, discounts, and costs.
 - **Geographical Data:** Information on regional performance.
 - **Profitability Data:** Metrics on manufacturing costs, gross sales, and total profits.
 - **Temporal Data:** Dates and timestamps for time-series analysis.
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4. METHODOLOGY

4.1 Data Import

- Imported the financial dataset in Excel format into Power BI Desktop.
 - Verified data integrity by ensuring schema consistency and proper column mappings.
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4.2 Data Cleaning and Transformation

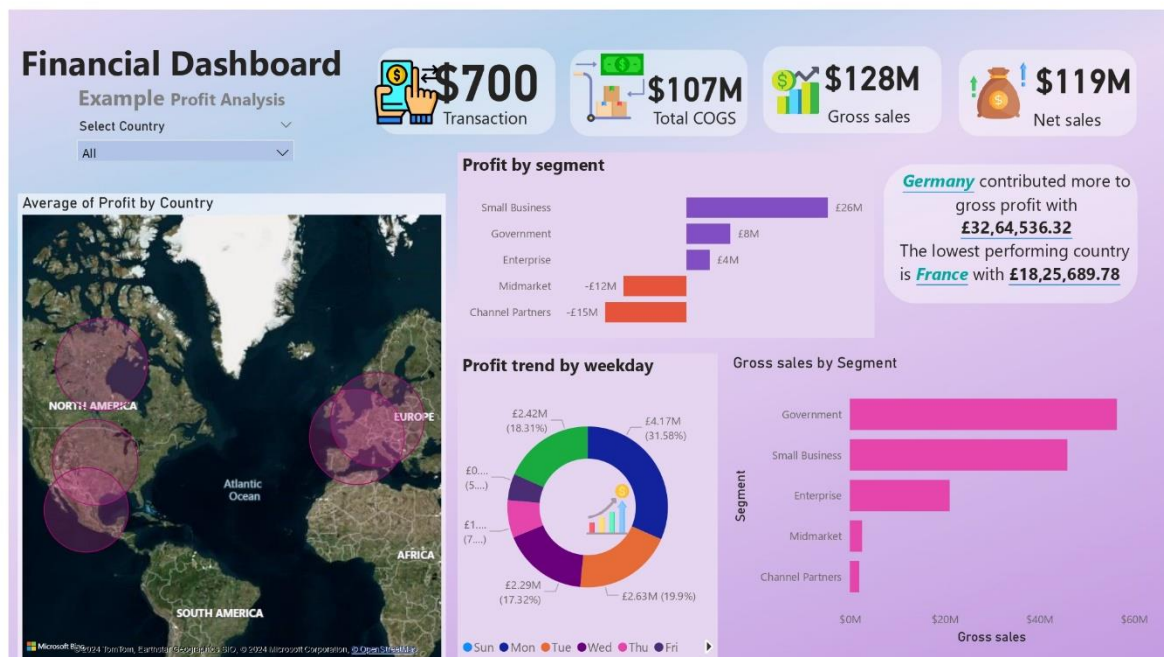
Performed data preparation in Power Query:

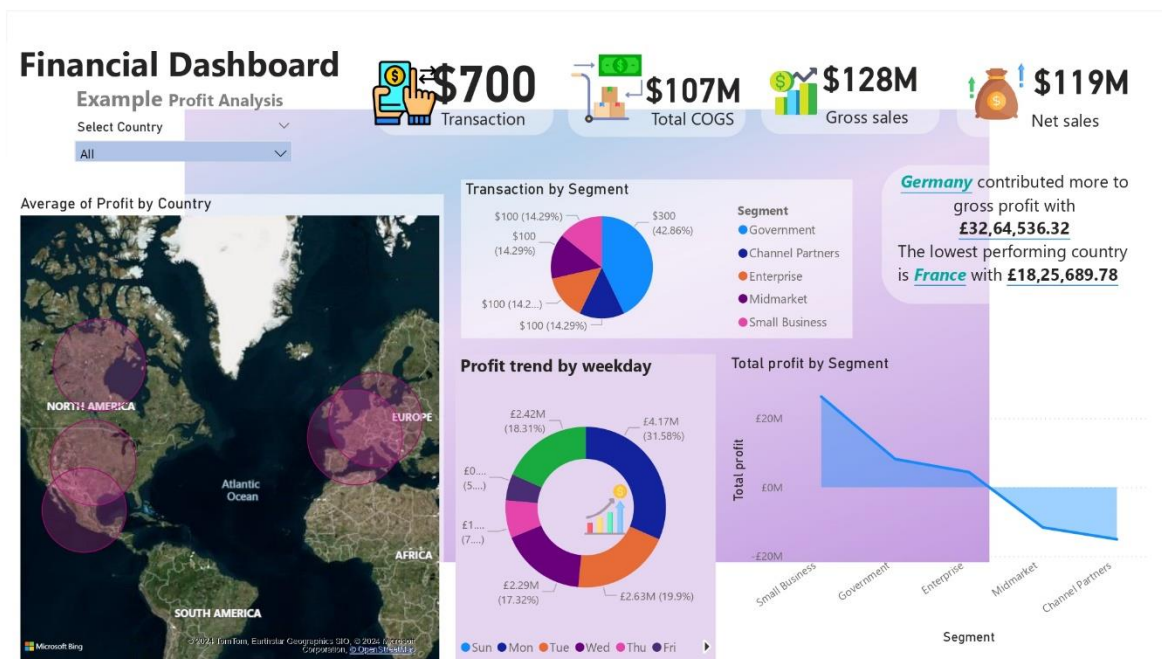
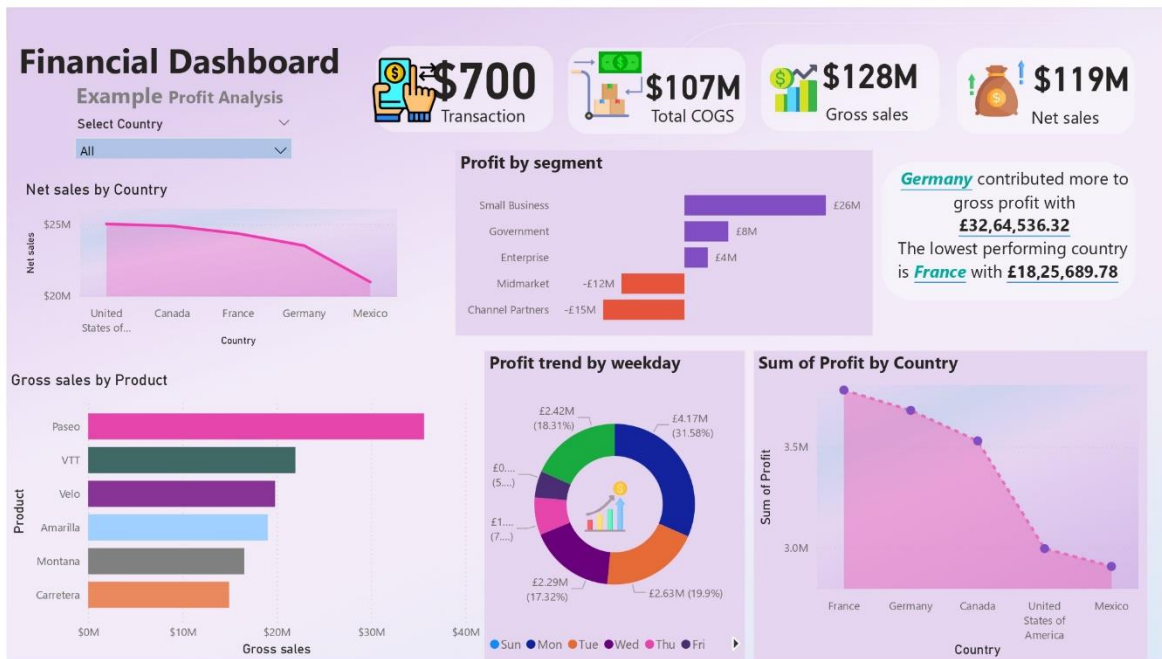
1. **Removed Unnecessary Columns:** Excluded redundant fields.
 2. **Handled Missing Values:** Replaced or removed null values to maintain dataset quality.
 3. **Data Type Corrections:** Ensured correct data types for numeric and date fields, such as formatting sales columns as currency and order dates as date types.
 4. **Renamed Columns:** Simplified column names for better understanding (e.g., "Mfr_Price" to "Manufacturing Price").
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4.3 Data Modeling

- Implemented a **star schema** for efficient querying and analysis.
 - **Fact Table:** Financial transactions containing measures like sales, discounts, and costs.
 - **Dimension Tables:** Includes regions, customers, products, and a date table.
- **Relationships:**
 - Established primary and foreign key relationships between the fact and dimension tables to enable accurate data aggregation.

DASHBOARD





4.4 DAX Measures

Key DAX Measures Created:

1. Transaction Count

DAX

Copy code

Transaction = COUNTROWS(financials)

- Counts the total number of transactions in the dataset.
- **Use Case:** Baseline measure to assess transaction volume.

2. Gross Sales

DAX

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Gross sales = SUMX(financials, financials[Units Sold] * financials[Sale Price])

- Calculates total revenue by multiplying units sold by sale price for each transaction.
- **Use Case:** Measures total potential revenue before accounting for discounts.

3. Total Discount

DAX

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Total discount = SUM(financials[Discounts])

- Sums up discounts provided across all transactions.
- **Use Case:** Tracks the financial impact of discounts.

4. Net Sales

DAX

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Net sales = [Gross sales] - [Total discount]

- Derives the revenue after accounting for discounts.
- **Use Case:** Reflects actual revenue generated.

5. Cost of Goods Sold (COGS)

DAX

Copy code

Cost of goods sold = SUMX(financials, financials[Units Sold] * financials[Manufacturing Price])

- Calculates production costs for goods sold.
- **Use Case:** Evaluates production cost for profitability analysis.

6. Total Profit

DAX

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Total profit = [Net sales] - [Cost of goods sold]

- Calculates overall profitability by subtracting COGS from net sales.
- **Use Case:** Key indicator for financial health.

7. Profit Positive/Negative

DAX

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Profit positive = IF([Total profit] > 0, [Total profit], 0)

Profit negative = IF([Total profit] < 0, [Total profit], 0)

- Segments positive and negative profits for trend analysis.

4.5 Visualization Design

An interactive dashboard was designed to include the following:

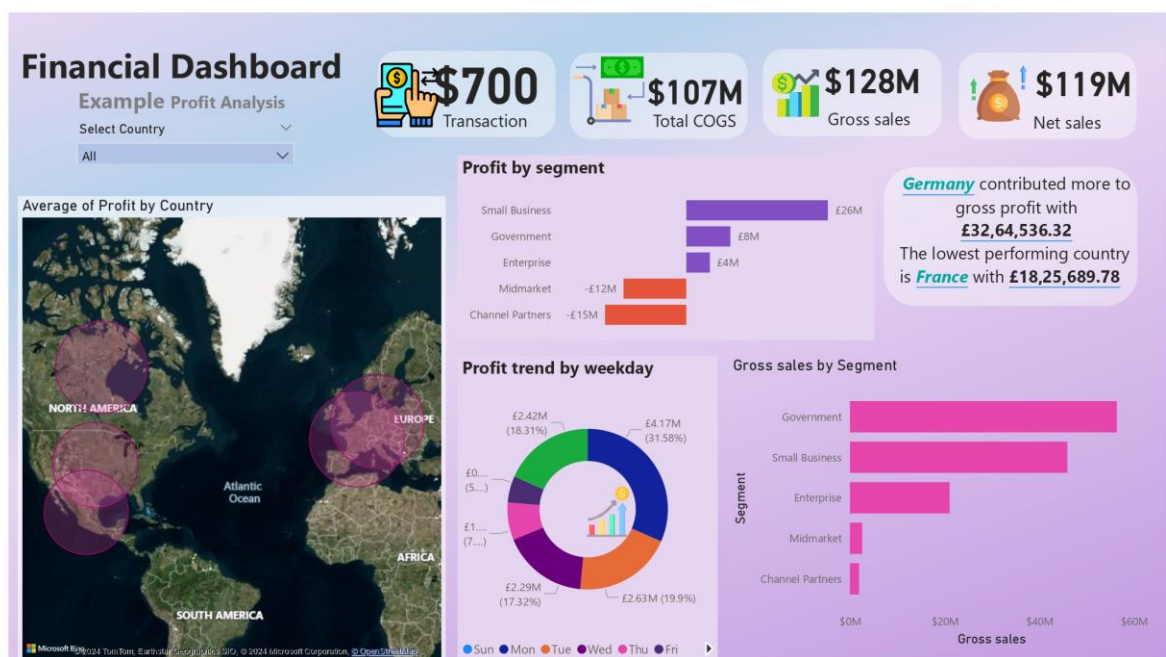
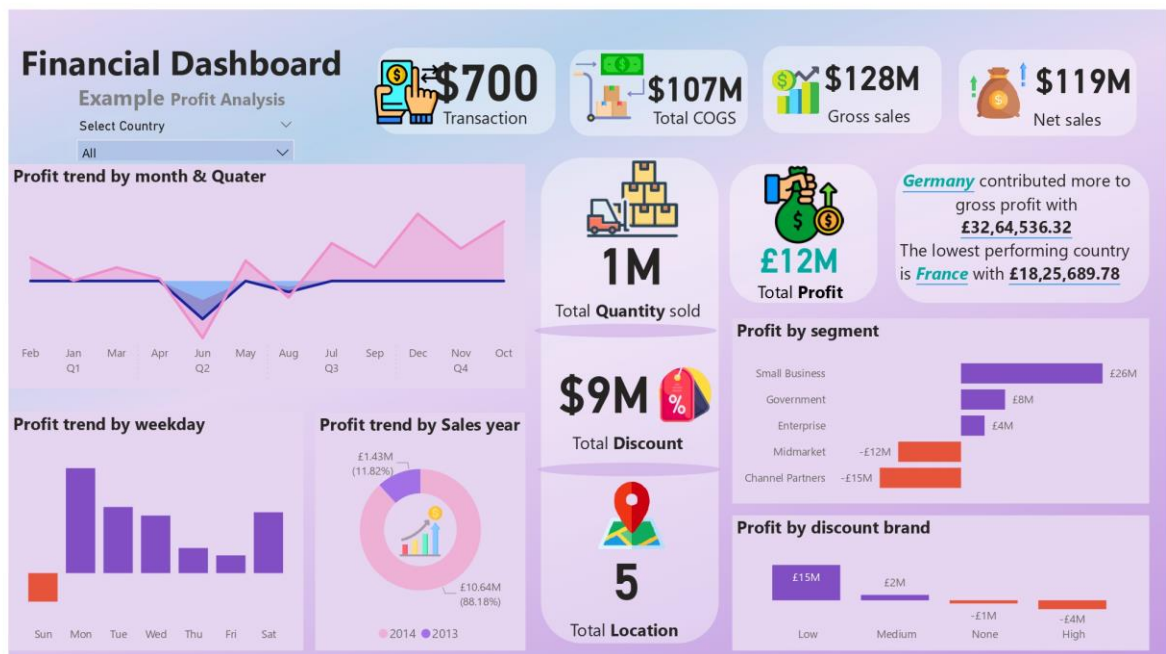
1. **Profit Trends:** Line chart displaying monthly profits using Profit Positive and Profit Negative.
 2. **Regional Sales:** Bar chart comparing sales performance across regions.
 3. **KPI Cards:** Highlighting total sales, total profits, and discounts.
 4. **Filters and Slicers:** Interactive elements to filter data by region, product category, and time period.
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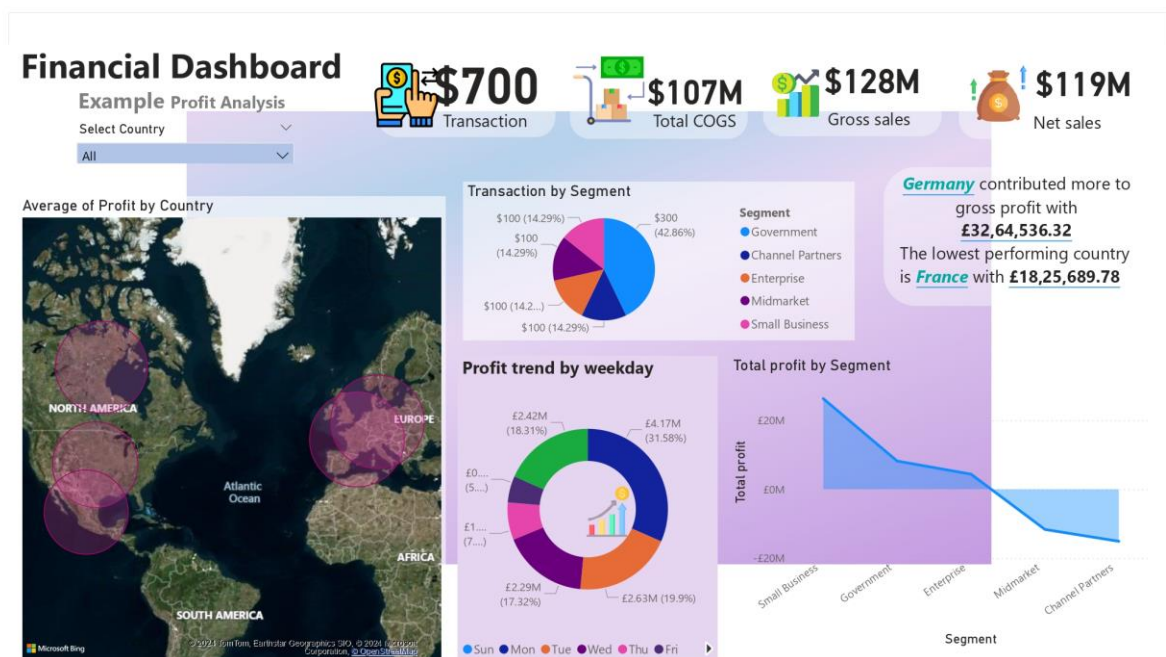
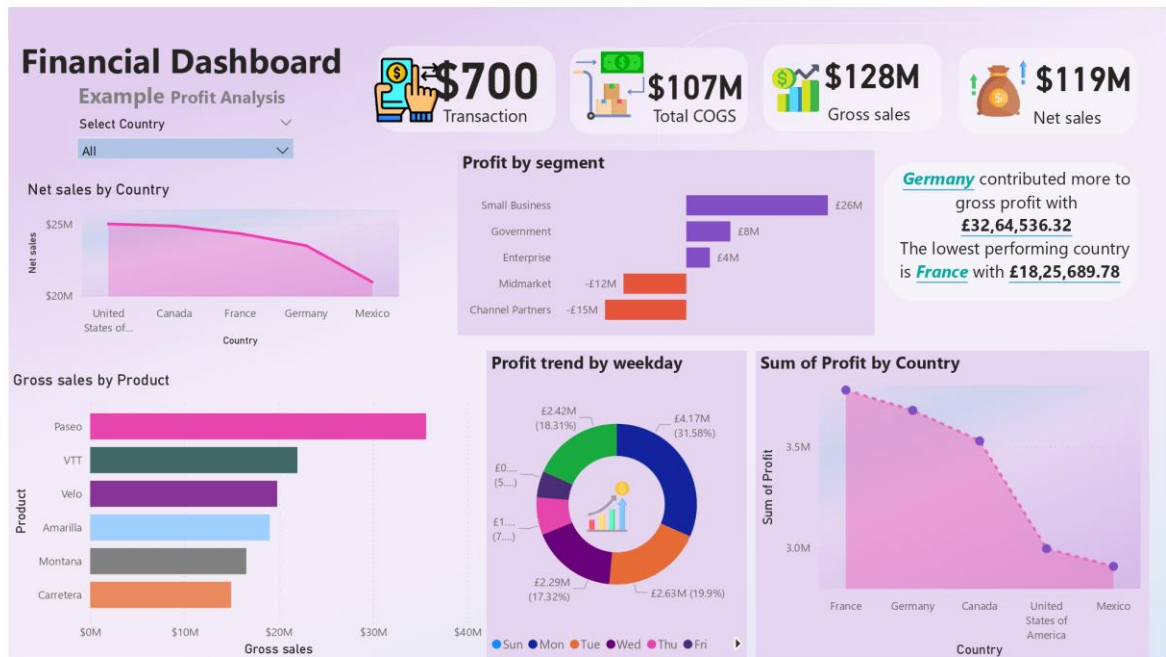
5. RESULTS

The Power BI dashboard provided the following actionable insights:

1. **Sales Trends:** Identified monthly and yearly sales growth patterns.
2. **Regional Performance:** Highlighted top-performing regions and underperforming markets.
3. **Profit Drivers:** Pinpointed key products and customer segments driving profitability.
4. **Discount Impact:** Analyzed the effect of discounts on revenue and profit margins.

DASHBOARD





6. CONCLUSION

This project successfully demonstrates how Power BI can be used to transform raw financial data into actionable insights. By implementing advanced data modeling, DAX calculations, and interactive visualizations, the dashboard enables stakeholders to analyze financial performance comprehensively and make data-driven decisions.

7. FUTURE SCOPE

1. **Real-Time Data Integration:** Incorporate live data feeds for real-time insights.
 2. **Advanced Analytics:** Use machine learning models within Power BI for predictive analytics.
 3. **Expanded Datasets:** Include external factors like market trends or competitor data.
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8. REFERENCES

- Financial Dataset (source information)
- Power BI Documentation by Microsoft
- Online tutorials on Power Query and DAX