

## 1. Introduction

The Power BI Superstore Dashboard project is an end-to-end analytics initiative designed to demonstrate the practical application of data transformation, modeling, DAX calculations, and interactive dashboard design. The goal of the project was to create a self-directed, professional Power BI solution that allows stakeholders to explore business metrics, identify trends, and make informed decisions based on actionable insights.

This project uses the Sample Superstore dataset, focusing on orders, returns, and time-based performance, while applying best practices in Power BI workflow and visual storytelling.

## 2. Project Objective

The primary objective of this project was to develop an interactive dashboard capable of:

1. Displaying key performance indicators (KPIs) such as Sales, Profit, and % Returned Orders.
2. Comparing current metrics against previous periods using year-over-year calculations.
3. Identifying trends in product performance, customer segments, and geographical regions.
4. Enabling dynamic exploration through slicers, bookmarks, and conditional formatting for better data-driven decision-making.

## 3. Data Sources

The project utilizes the following data tables:

- **Orders Table:** Contains transactional information including order dates, product details, quantities, sales, and profits.
- **Returns Table:** Tracks returned orders, which allows the calculation of return rates and the impact on profitability.
- **People Table:** A dedicated date dimension was created to support time intelligence calculations and ensure accurate year-over-year comparisons.

Relevant columns were carefully selected to optimize performance, focusing on date, product, geographical, and segment dimensions.

## 4. Methodology

### 4.1 Data Transformation

The initial datasets were cleaned and prepared using **Power Query**. The process included:

- Removing unnecessary columns to reduce dataset size.
- Promoting headers and ensuring consistent data types.
- Handling missing or inconsistent values.

This preparation ensured that the data was reliable and optimized for modeling and analysis in Power BI.

### 4.2 Data Modeling

A **star schema** was implemented to organize the data efficiently:

- The Orders table serves as the central fact table.
- The Returns table is connected to Orders via OrderID to allow accurate calculation of returns.
- The Date table connects to both Orders and Returns to enable time-based analyses and DAX time intelligence calculations.

Relationships were carefully established to support accurate aggregations and filtering across the dashboard.

### 4.3 DAX Measures

Key calculations were implemented using **DAX**, organized into three categories:

1. **METRIC (Current Period):** Sales, Profit, % Returned Orders
2. **PY (Previous Year):** Sales PY, Profit PY, % Returned Orders PY
3. **Vs PY (Change vs Previous Year):** Sales vs PY, Profit vs PY, % Returned Orders vs PY

These measures are stored in a dedicated “Key Measures” table and categorized for clarity, enabling accurate comparisons and trend analyses.

### 4.4 Dashboard Design

The dashboard was designed with a focus on **interactivity and storytelling**:

- A custom  **slicer panel**  allows filtering by Segment, Region, Customer, and Date Range.
- **Conditional formatting** highlights positive and negative trends for quick interpretation.
- **Visual types** include KPI cards, line charts, bar charts, donut charts, and shape maps to effectively communicate insights.
- Bookmarks and grouped shapes were used to enhance user navigation and visual clarity.

## 5. Analysis & Findings

The dashboard was designed to answer key business questions:

1. **KPI Metrics:** Sales, Profit, and % Returned Orders were analyzed with conditional formatting to quickly identify areas of growth or concern.
2. **Sales Performance Over Time:** Line charts comparing current versus previous year sales highlighted seasonal trends and growth patterns.
3. **Product Profitability:** Bar charts identified the most profitable and loss-making products, enabling targeted business decisions.
4. **Geographical Profit Analysis:** Shape maps revealed the regions generating the highest and lowest profits.
5. **Segment Performance:** Donut charts provided insights into the performance of different customer segments.

The combination of DAX measures, interactive visuals, and slicers allowed for a comprehensive exploration of the data.

## 6. Conclusion

The Power BI Superstore Dashboard demonstrates a full workflow from raw data to interactive visualizations. Key takeaways include:

- Effective organization of DAX measures for clarity and maintainability.
- Implementation of a star schema to optimize reporting performance.
- Use of interactive visualizations and conditional formatting to enhance decision-making.
- The project highlights the integration of **SQL, Power Query, DAX, and Power BI visual design** to deliver a professional, end-to-end analytics solution.

This project showcases the ability to independently prepare data, model relationships, create complex calculations, and deliver a polished, interactive dashboard that communicates insights effectively.