

Power BI Dashboard Report: Superstore Sales Dataset

Objective

The goal of this assignment is to demonstrate the ability to clean, transform, and visualize data using Power BI. The insights derived from this process can be used for decision-making to improve business performance. In this report, I will focus on the Superstore Sales Dataset and will provide meaningful insights from the created Power BI dashboard.

Data Cleaning and Transformation

Data Overview

The dataset provided contains the following components:

- **Order Details:** Order ID, Order Date, Ship Date
- **Customer Details:** Customer Name, Customer Segment
- **Product Details:** Category, Sub-Category, Product Name
- **Sales Data:** Sales Amount, Profit, Discount, Quantity
- **Geography:** Region, State

Handling Missing Values and Duplicates

Since the dataset contains no missing values or null entries, the focus was on ensuring that the data types were correctly assigned for each field. In Power BI, the appropriate data types for each field were verified to ensure proper calculations and visualizations. For example, Order Date and Ship Date were assigned as Date/Time data types, while sales-related fields like Sales Amount and Profit were recognized as Currency.

There were no duplicate records found in the dataset, which ensured that the integrity of the data remained intact.

Data Transformation

For better analysis and insights, I used **DAX (Data Analysis Expressions) functions** to create **measures** instead of new columns. The following measures were created:

- **Total Sales:** SUM(sheet1[Sales Amount])
- **Total Profit:** SUM(sheet1[Profit])
- **Total Quantity:** SUM(sheet1[Quantity])
- **Profit Margin:** DIVIDE(sheet1[Total Profit], sheet1[Total Sales])

These measures allow for dynamic calculations and efficient performance in Power BI visualizations

Dashboard Design & Visualizations

The following Power BI visuals were created to provide a comprehensive overview of the Superstore Sales performance:

1. KPI Cards

Three key performance indicators (KPIs) were displayed to give a quick snapshot of the overall sales performance:

- **Total Sales:** This KPI card shows the total sales amount(514.29k) across all regions and product categories.
- **Profit:** This KPI card highlights the overall profit achieved from all orders.(sum of profit 92.31k)
- **Quantity:** The total number of products sold.(sum of Quantity 5491)

2. Line Chart: Monthly Sales Trends

A line chart was created to visualize the sales trends over time. This chart helps to identify patterns, seasonal spikes, and declines in sales:

- **X-Axis:** Year and Month (derived from the Order Date)
- **Y-Axis:** count of Sales Amount

The chart visually illustrates how sales have varied across different months, helping identify peak periods and low-performing months.

3. Map: Profit Distribution Across Regions

A map visualization was created to show the profit distribution across various regions:

- The **Region(Location)** and **Profit(Legend)** columns were used to show the geographical areas that performed well or poorly.
- This map allows stakeholders to easily identify high-profit regions and areas where improvement is needed.

4. Bar Chart: Top & Bottom Products by Profit

A bar chart was created to show the products with the highest and lowest profit:

- **X-Axis:** Product Name
- **Y-Axis:** sum of Profit

This chart helps to easily identify the most profitable and least profitable products, providing insights into inventory and sales strategies.

5. Scatter Plot: Impact of Discounts on Profit Margins

A scatter plot was used to assess how discounts impact the profit margins for each product:

- **X-Axis:** Discount
- **Y-Axis:** Profit Margin
- **Size:** Total Sales

The scatter plot illustrates the relationship between discounts and profit margins, helping the business understand whether offering discounts negatively or positively affects profits.

Interactivity & Usability

To enhance the interactivity and usability of the dashboard, I implemented the following features:

Slicers

Slicers were added to enable users to filter data based on key parameters:

- **Region:** Enables users to focus on specific regions for more granular insights.
- **Customer Segment:** Helps to filter data by customer types
- **Category:** Enables users to analyze performance by product category.

Drill-through and Tooltips

- **Drill-through functionality** was implemented, allowing users to right-click on a specific data point (e.g., a particular product) and view detailed information on sales, profit, and discount performance for that specific item.
 - **Tooltips** were added to display additional details when hovering over various visual elements, providing users with more context without cluttering the dashboard.
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Key Insights & Business Recommendations

Key Insights

- **High Discount Doesn't Always Equal High Profit:** The scatter plot "Sum of Discount vs Profit Margin" shows a cluster of data points with a relatively high sum of discount (around 100) but a moderate profit margin (around 0.18). This suggests that simply offering large discounts isn't a guarantee of higher profitability.
- **Sales Spiked and Declined in Early 2023:** The "Count of Sales Amount by Year and Month" line chart shows a significant peak in sales amount around February-March 2023, followed by a noticeable decline towards the later months of 2023 and a very low point in January 2024. This trend needs investigation

- **Paper and Binders Lead in Sales Count:** The "Sum of Profit by Product Name" bar chart shows "Paper" and various entries of "Binders" having the highest bar heights. This indicates these products have the highest number of sales

Business Recommendations

- **Optimize Inventory for High-Profit Products:** Focus on stocking high-margin products that consistently perform well in terms of sales and profit. Underperforming products should be analyzed to determine if price adjustments or promotional strategies could help improve their sales.
- **Regional Strategy Refinement:** Focus on improving performance in underperforming regions by analyzing the local market trends, adjusting marketing strategies, and identifying high-potential customer segments.
- **Discount Strategy Review:** Review the current discount practices to ensure they align with profit goals. Discount strategies should be adjusted to prevent a negative impact on profit margins.

Conclusion

The Power BI dashboard provides valuable insights into the sales and profit performance of the Superstore. The interactive features allow stakeholders to filter data and drill down into specifics, enabling data-driven decision-making. The insights derived from the visualizations can help inform strategies for inventory management, marketing, and sales optimization.