

A Study on Problems and Prospects of Data Visualization in Super Store Using Data Analysis Tools

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ABSTRACT

This study aims to investigate the challenges and opportunities associated with data visualization in superstores utilizing various data analysis tools. By understanding the problems faced and exploring the prospects of effective data visualization this research contributes to the enhancement of decision-making processes within retail sector. In the ever-evolving landscape of retail superstores rely heavily on data-driven insights to make informed decisions and enhance operational efficiency.

The sales analysis on Superstore dataset is a comprehensive study that aims to analyze the sales performance of a fictional retail company called "Superstore". The dataset used in this analysis contains information about sales transactions, customers, products, and geographical locations. The analysis involves using Power BI, a data visualization and reporting tool, to create interactive dashboards and reports that provide insights into the sales performance of Superstore. The data is cleaned and transformed using Power Query, and a data model is created using Power BI's data modelling tools. The analysis includes several key metrics, such as sales revenue, profit, and margin, which are visualized using charts, tables, and graphs. The analysis also explores trends in sales over time, product categories, customer segments, and geographical regions. The results of the analysis provide valuable insights into Superstore's sales performance, highlighting areas of strength and weakness. The analysis reveals that Superstore's sales are strongest in the East and West regions of the United States, and that furniture is the most profitable product category. The analysis also identifies opportunities for improvement, such as increasing sales in the Central region and improving customer retention. Overall, the sales analysis on Superstore dataset provides a valuable tool for businesses to better understand their sales performance and make data-driven decisions to improve their sales processes.

Keywords: Sale Analysis, Research, SQL, Relationships, DAX optimization, Dashboard, Visualization.

1. INTRODUCTION AND OBJECTIVE

The sales analysis on Superstore dataset is a study aimed at analyzing the sales performance of a fictional retail company called "Superstore". The analysis utilizes a dataset containing information about sales transactions, customers, products, and geographical locations. The retail industry is highly competitive and dynamic, with businesses facing numerous challenges such as changing consumer behavior, increasing competition, and shifting market trends. In such an environment, it is crucial for businesses

to have a deep understanding of their sales performance to remain competitive and drive growth. The Superstore dataset provides an opportunity to conduct an in-depth analysis of sales performance, enabling businesses to gain valuable insights into their sales performance, identify areas of strength and weakness, and make data-driven decisions to improve their sales processes. To conduct the sales analysis on the Superstore dataset, Power BI, a data visualization and reporting tool, is used to create interactive dashboards and reports. The data is cleaned and transformed using Power Query, and a data model is created using Power BI's data modeling tools. The analysis includes several key metrics, such as sales revenue, profit, and margin, which are visualized using charts, tables, and graphs. The analysis also explores trends in sales over time, product categories, customer segments, and

geographical regions. The findings of the sales analysis on Superstore dataset can provide valuable insights into the sales performance of a retail business, helping them identify areas for improvement, develop more effective sales strategies, and ultimately drive growth and profitability.

1. Identify the current state of data visualization practices in superstores.
2. Explore the challenges encountered in implementing data visualization in a superstore setting.
3. Examine the prospects of enhancing data visualization through advanced data analysis tools.
4. Assess the impact of data visualization on decision-making and operational efficiency in superstores.
5. Provide recommendations for improving data visualization practices in superstores.

2. METHODOLOGY

The study will employ a mixed-methods approach, combining both quantitative and qualitative research methods. Surveys and interviews will be conducted with superstore managers, data analysts, and other relevant personnel to gather insights into the existing data visualization practices, challenges faced, and the perceived prospects. Additionally, data will be collected from the superstore's internal databases and analyzed using data analysis tools to understand the impact of visualization on decision-making.

The methodology of sales analysis on Superstore dataset involves several steps, which include:

Data collection: The Superstore dataset is collected from a reliable source, such as Kaggle or a company's internal database.

Data cleaning and preparation: The data is cleaned and prepared using Power Query in Power BI. This involves removing duplicates, correcting errors, and filling in missing values.

Data modeling: A data model is created using Power BI's data modeling tools. The model includes tables, relationships, and calculated columns.

Metrics selection: The key metrics for sales analysis, such as sales revenue, profit, and margin, are identified and selected.

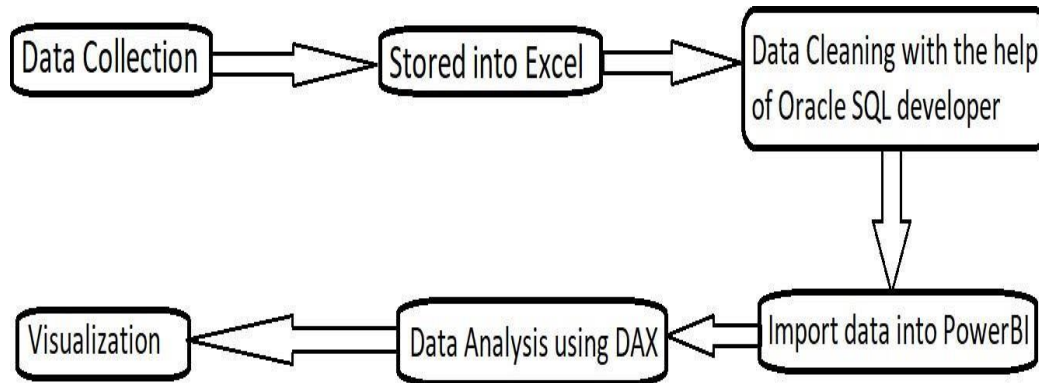
Data visualization: The selected metrics are visualized using charts, tables, and graphs. Power BI provides a variety of visualization options, including bar charts, line charts, and maps.

Analysis and interpretation: The visualizations are analyzed and interpreted to gain insights into the sales performance of Superstore. This includes identifying trends, patterns, and areas of strength and weakness.

Recommendations: Based on the analysis and interpretation, recommendations are made to improve sales performance. These recommendations could include changes to pricing strategies, product offerings, or marketing campaigns.

The methodology of sales analysis on Superstore dataset is iterative and involves refining the analysis based on the insights gained. Power BI provides a flexible and powerful platform for conducting sales analysis, enabling businesses to gain valuable insights into their sales performance and drive growth and profitability.

3. FLOW CHART



4. RESULTS AND DISCUSSION

Reports:-

A "sales dashboard" typically refers to a graphical representation of sales data and performance metrics. Sales dashboards are used by businesses to track and analyze their sales activities and results. These dashboards often include various reports and visualizations that provide insights into sales performance. Here are some common types of reports and elements you might find in a sales dashboard

Sales Revenue Report: This report shows the total revenue generated over a specific period, such as daily, monthly, or yearly. It may also include a comparison to previous periods.

Sales by Product/Service Report: This report breaks down sales by individual products or services. It helps identify which offerings are performing well and which may need attention.

Sales by Region/Location Report: This report displays sales data based on geographical regions or specific locations. It's useful for understanding regional variations in sales.

Sales Funnel Report: A sales funnel report shows the progression of leads or prospects through different stages of the sales process, from initial contact to conversion.

Sales Team Performance Report: This report evaluates the performance of sales teams or individual sales representatives. It may include metrics like deals closed, conversion rates, and revenue generated.

Customer Acquisition Cost (CAC) Report: This report calculates the cost of acquiring new customers and helps assess the efficiency of your marketing and sales efforts.

Lead Conversion Rate Report: This report tracks the rate at which leads or prospects are converted into paying customers, providing insights into the effectiveness of the sales process.

Inventory Management Report: If your business involves physical products, an inventory report helps monitor stock levels, reorder points, and sales trends for each product.

Sales Forecast Report: A forecast report predicts future sales based on historical data and current trends, aiding in budgeting and resource planning.

Pipeline Report: The sales pipeline report displays the status of deals at various stages of the sales process, helping sales teams prioritize and manage their opportunities effectively.

Profit Margin Report: This report calculates the profitability of sales by factoring in the cost of goods

sold and other expenses, providing insights into the overall health of your sales efforts. Sales dashboards can also include various charts, graphs, and key performance indicators (KPIs) to make it easy to interpret the data at a glance. They are often customized to fit the specific needs and goals of a business and can be created using various software tools and business intelligence platforms. The reports within a sales dashboard help sales teams and management make data-driven decisions to optimize sales strategies and drive revenue growth.

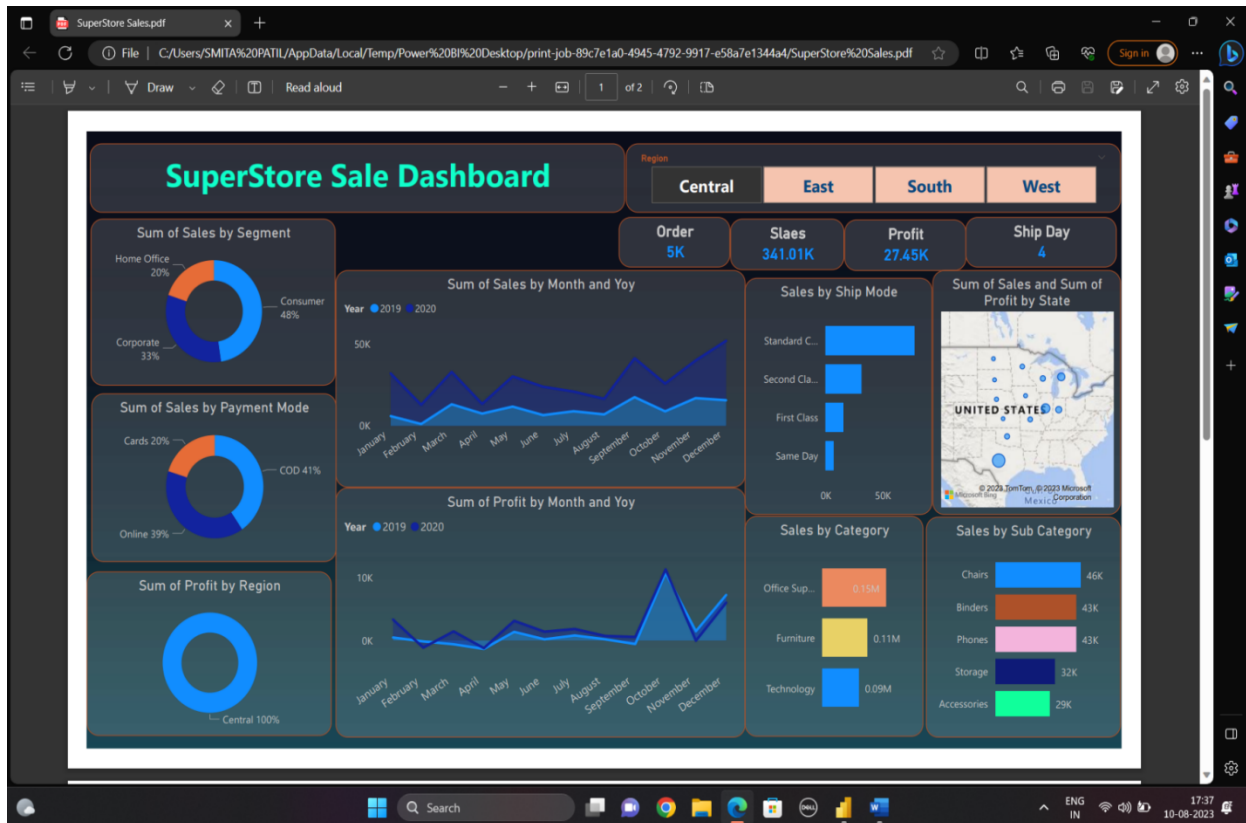


Fig 1: Sample output of sales analysis

In above dashboard we have three cards displaying the total unit sold, total profit and total revenue. They provide direct information to user. The next visualization tool used is stacked column chart which is useful to make a very quick comparison between two or more sets of measures. Here we used this chart to create combine visual of profit, revenue, and sales by month which gives us the idea about the profit, revenue, and sales variation by month. In month of October the company has increased its profit, revenue, and sales as compared to other months. To know the profit of particular country pie chart comes into picture. It is used to illustrate the contribution of different values to a total. It gives the clear view about the country wise profit of company. The next visual used here is Line Chart. It gives plan to understand the profit by month. It is used to show the information changes over time. It tells company head that in October company is valued and the line goes on decreasing from October to March. By one click on the any visual it gives the all information that dashboard contains.

5. CONCLUSION

By addressing the problems and prospects of data visualization in superstores, this study aims to provide valuable insights that can guide the implementation of effective data analysis tools and improve decision-making processes within the retail sector. The findings will contribute to the ongoing discourse

on the intersection of data-driven insights and operational excellence in superstores.

In conclusion, the sales analysis on Superstore dataset provides valuable insights into the sales performance of a retail business. By analyzing the data using Power BI, businesses can gain insights into their sales revenue, profit, and margin, as well as identifying trends in sales over time, product categories, customer segments, and geographical regions.

The analysis helps businesses identify areas for improvement, develop more effective sales strategies, and ultimately drive growth and profitability. The methodology of sales analysis on Superstore dataset involves data collection, cleaning and preparation, data modelling, metrics selection, data visualization, analysis and interpretation, and recommendations.

Power BI provides a flexible and powerful platform for conducting sales analysis, enabling businesses to gain valuable insights into their sales performance and make data-driven decisions. By continuously analyzing and refining the analysis based on the insights gained, businesses can remain competitive and drive growth in the highly dynamic retail industry.

REFERENCES

Here are some references for sales analysis on Superstore dataset:

R Graph Gallery: This gallery provides a wide variety of visualizations created using R, along with code examples for each visualization. Website: r-graph-gallery.com

Remember that data visualization is not just about creating pretty charts; it's about effectively conveying insights and telling a story through data. As tools and techniques evolve, staying updated with the latest trends and best practices will help you create impactful visualizations. Top of Form

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