

SALES AND CUSTOMER TRENDS ANALYSIS

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1. INTRODUCTION

The purpose of this report is to present the results of an investigation into sales and customer trends using three Power BI dashboards. The analysis focused on identifying trends in sales performance, understanding customer behavior and sales trends, and examining the geographic distribution of sales data. This study fits into the current literature on data analysis and business intelligence by providing a practical application of these tools in the analysis of sales and customer trends.

Previous studies have examined the use of data analysis and business intelligence tools in various industries, including retail and e-commerce. These studies have found that such tools can provide valuable insights into business performance and help inform strategic decision making.

The investigation of sales and customer trends using Power BI dashboards is worth examining as it can provide valuable insights for businesses looking to optimize their sales strategies and better understand their customers. The experiment consisted of creating and analyzing three Power BI dashboards using relevant sales data.

1.1. EXECUTIVE SUMMARY

This report presents the results of an examination into sales and client trends utilizing three Power BI dashboards. The primary objective was to recognize patterns in sales performance, comprehend consumer behavior and sales patterns, and scrutinize the geographic distribution of sales data. The analysis was based on a US regional dataset, that covered a snapshot of a specific three-year period. The goals of the dashboards were to identify the most productive sales channels, comprehend tendencies in consumer behavior and sales patterns, analyze the correlation between household income and average sales, and determine the overall sales, number of orders, and average order value for the chosen period.

Based on the findings, recommendations were made to enhance sales performance, boost online sales, adjust pricing strategies for specific client groups and concentrate on states with low average household income.

1.2. OVERVIEW

- The key findings of the report include trends in sales and orders over time, an understanding of customer behavior and sales trends, and the geographic distribution of sales data. These findings contribute to the current knowledge in the field of data analysis and business intelligence by providing a practical application of these tools in the analysis of sales and customer trends.
- The implications of the report's findings are that businesses can use the insights provided to optimize their sales strategies and better understand their customers. The limitations of the report include the reliance on the quality and completeness of the sales data used in the analysis.

1.3.DATASET USED

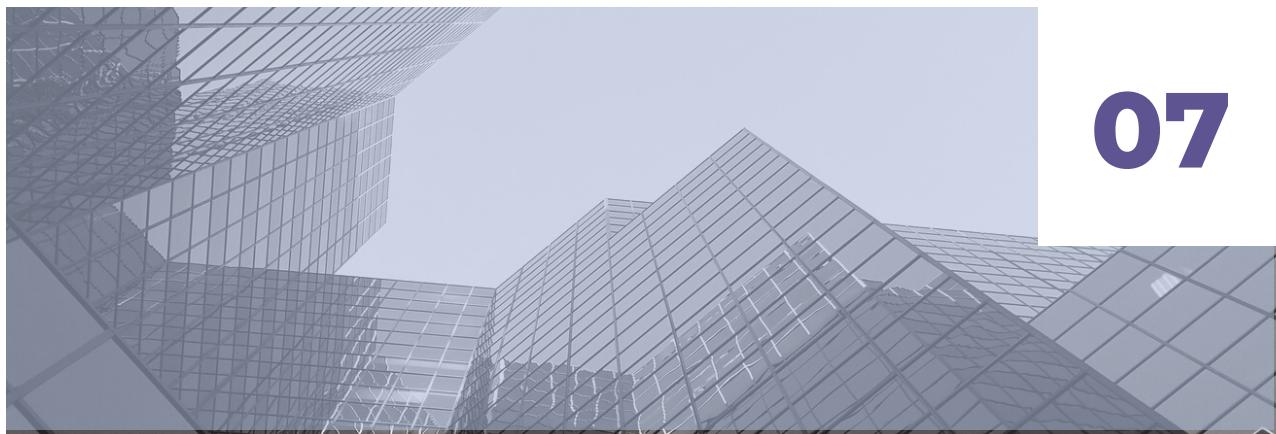
The US regional dataset is a collection of data that was internally sourced by the company. It is a comprehensive dataset that covers a snapshot of a specific three-year time period and includes six tables: the sales table, customer table, stores location table, product table, state regions table, and sales team table.

The data in the sales table includes 14 columns with detailed information on order, shipping, and delivery dates, along with order numbers, quantities, profit, and cost.

The customer table offers insight into the names of customers and their type, while the stores location table includes information on the location of stores such as the state, county, city, city type, population numbers, and household income.

The product table lists the types of products sold during the time period, the state regions table provides information on states and state regions in the United States, and the sales team table includes information on the team number and the region for which they are responsible.

Before the data could be used in the dashboard, I performed some data cleaning and formatting, and added additional columns to show the month name and number, as well as the year, separately. The data is accurate and reliable, with no known issues regarding the quality of the data.



1.4. Requirements

The investigation of sales and customer trends using Power BI dashboards is worth examining as it can provide valuable insights for businesses looking to optimize their sales strategies and better understand their customers. The experiment consisted of creating and analyzing three Power BI dashboards using relevant sales data.

The objectives of the Dashboards are:

- Identify the most successful sales channels
- Understand the patterns in customer behavior and sales trends
- Analyze the relationship between household income and average sales.
- Map the sales and population trends across the US by state
- Determine the total sales, number of orders, and average order value for the selected time period.

It was expected that the analysis of the Power BI dashboards would provide insights into sales performance, customer behavior and sales trends, and the geographic distribution of sales data, which could inform business strategy and decision making.

2.SOLUTION

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2.1.Tools

Data visualizations is a powerful tool for making sense of complex data and improving decision making. They can help turn data into meaningful stories and insights that can be used to understand business performance and inform important decisions. Additionally, data visualizations can make it easier for people in an organization to understand and engage with data, leading to better decisions and outcomes. For this project, I focused on using Microsoft Power BI considering it is one of the most popular tools in business now adays and commonly used by corporations

2.1.1.Microsoft Power BI

Microsoft Power BI is a business intelligence (BI) platform that provides nontechnical business users with tools for aggregating, analyzing, visualizing and sharing data. Power BI's user interface is fairly intuitive for users familiar with Excel, and its deep integration with other Microsoft products makes it a versatile self-service tool that requires little upfront training.



2.2.COMPONENTS

2.2.1.Reports and Dashboards

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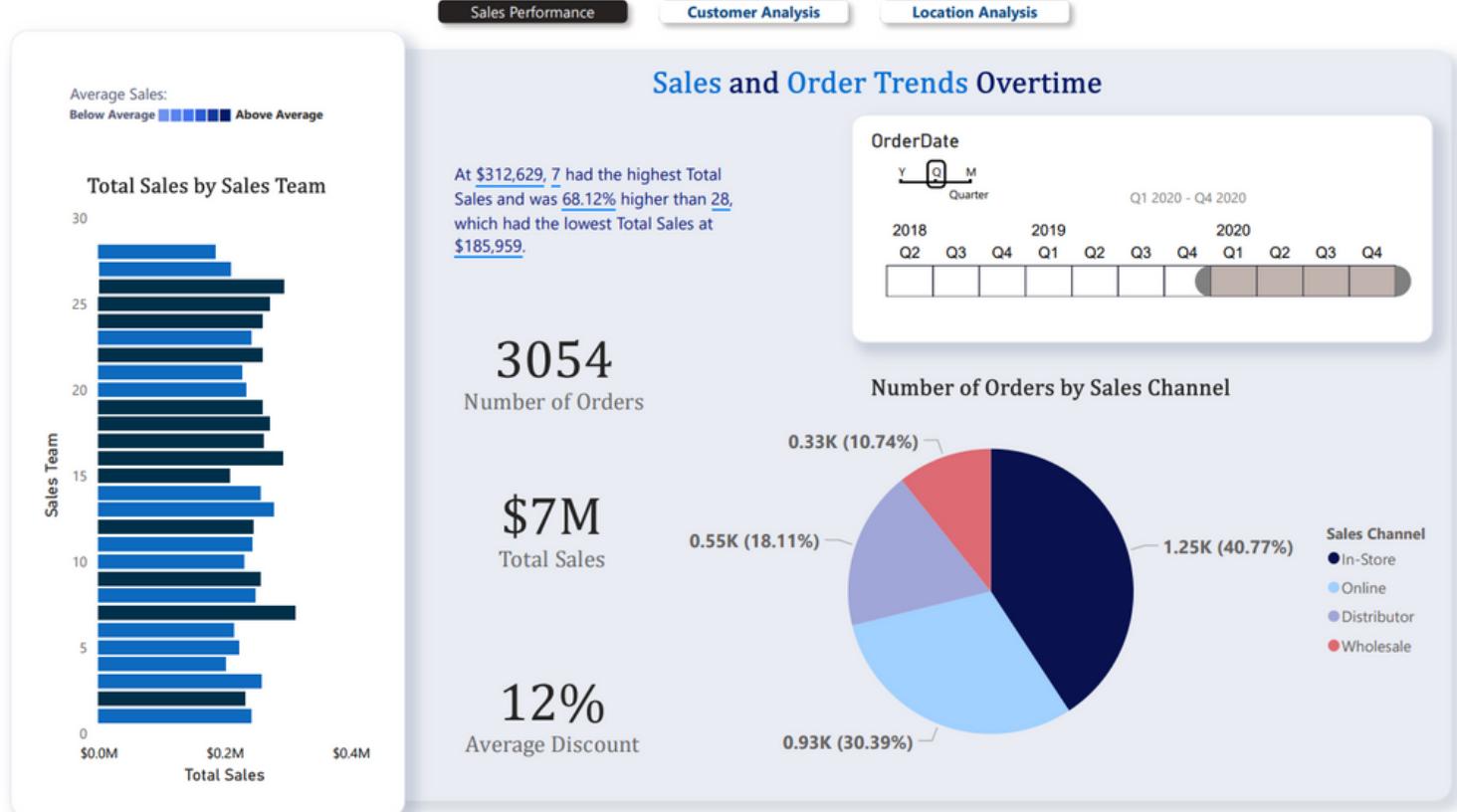


Figure (1)

As shown in Figure (1), the "sales and order trends over time" dashboard provides a wealth of insights into the performance of a business's sales and orders in the time period between 2018 and 2020.

As seen, in the year 2020, the In Store sales made the highest contribution that year with (40.77%) of the total orders with a total profit that year of 7 million dollar.

The main feature of this dashboard is a timeline of the order date, which allows users to filter the entire dashboard by a specific time period(Year , Quarter , Month). This enables users to focus on specific timeframes and identify trends and patterns in sales and orders over time.

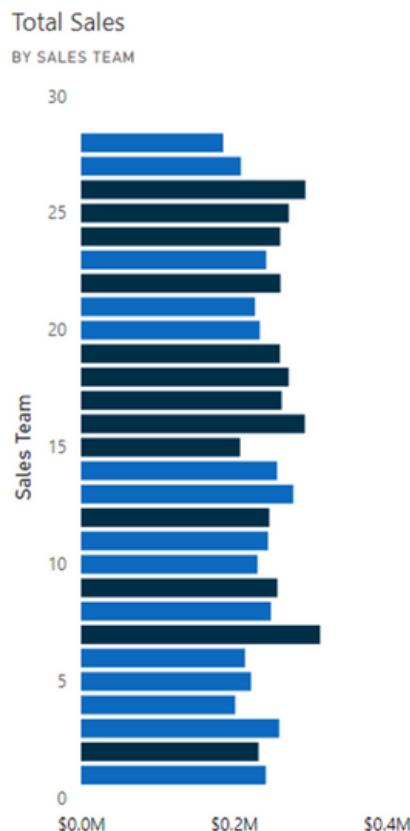


Figure (2)

To provide a more detailed analysis of the sales performance, the dashboard also includes a pie chart, see figure (2), that shows the number of orders by sales channel. This visualization allows users to understand which sales channels are performing well and which ones may need more attention.

To provide an even more detailed analysis of sales performance, the dashboard includes a stacked bar chart as shown in Figure (3), that demonstrate total sales by sales team. In year 2020, team number 7 had the highest sales total and was 68% higher than the lowest team, of course, you can filter each chart or KPI by team.

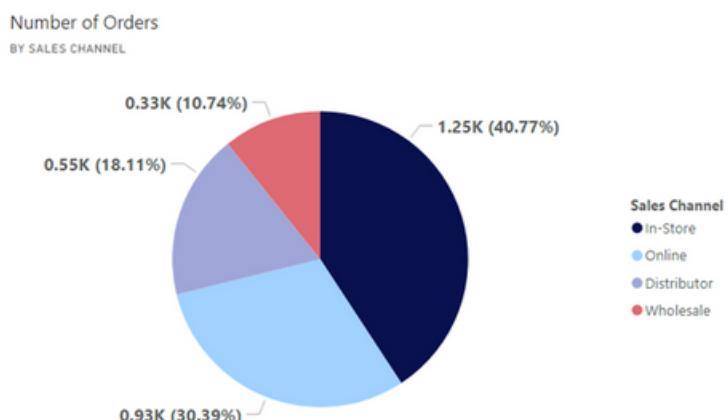


Figure (3)

REPORTS AND DASHBOARDS

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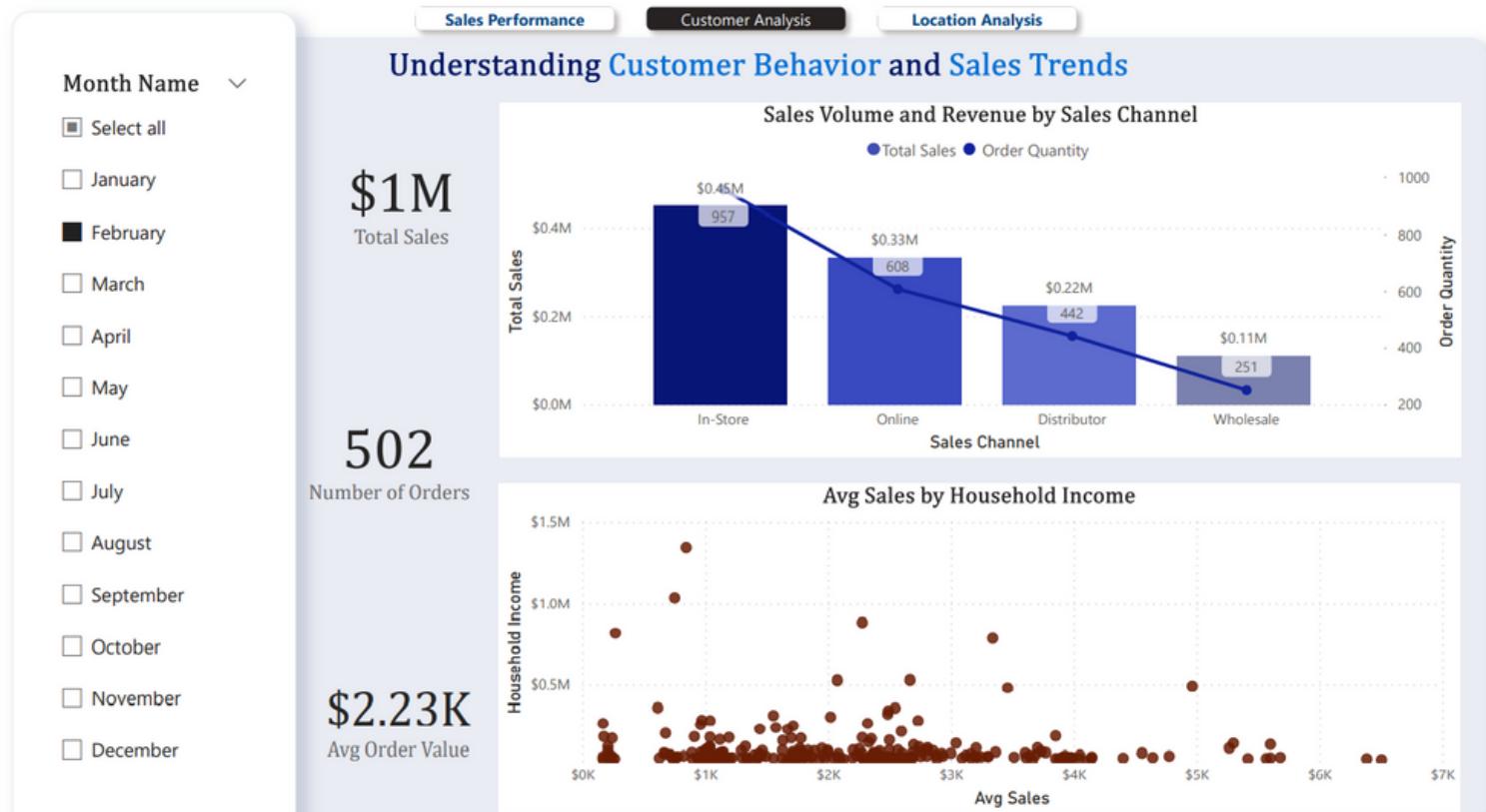


Figure (4)

The dashboard shown in Figure (4) enables users to filter the data by specific time periods, allowing them to focus on specific months and identify trends over time. The various visualizations provided in the dashboard such as line and clustered column chart, scatter chart and cards, enable users to gain a deeper understanding of customer behavior and sales trends. For example, it's shown that in the month of February, total profit of the organization was 1 million Dollar and average order value that month was 2.23 thousand dollar.

Furthermore, the dashboard provides a good overview of the key performance indicators of the business, which can aid in taking better decision to drive the business forward.

The first visualization is a line and clustered column chart presented in Figure (5), that shows sales volume and revenue by sales channel. In February, In Store channels had the highest revenue as well as the highest sales volume, which gives us an insight of customers shopping preferences and Wholesale in general needs more attention. It also enables users to compare sales volume and revenue across different sales channels and identify any patterns or trends.

Sales Volume and Revenue by Sales Channel



Figure (5)

To understand customer behavior in more detail, the dashboard also includes a scatter chart that shows the average sales by household income. As Figure(6) suggests, the sales for group of households with incomes between 0 to a little less than 0.5 million dollars is relatively low, this may indicate a need to adjust the pricing strategy for this group or explore other product or service options that are more affordable or better targeted to this income group..

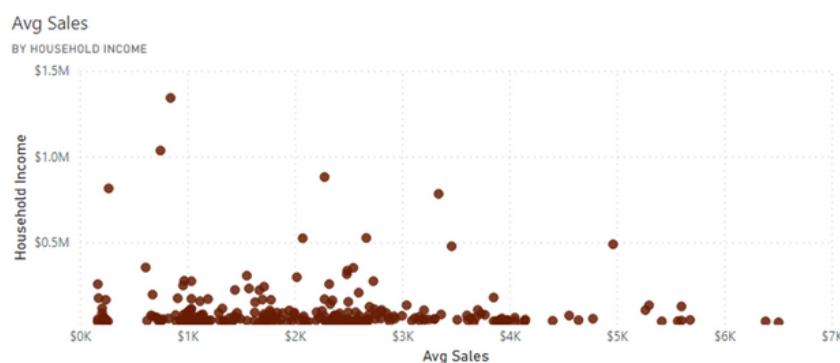


Figure (6)

REPORTS AND DASHBOARDS

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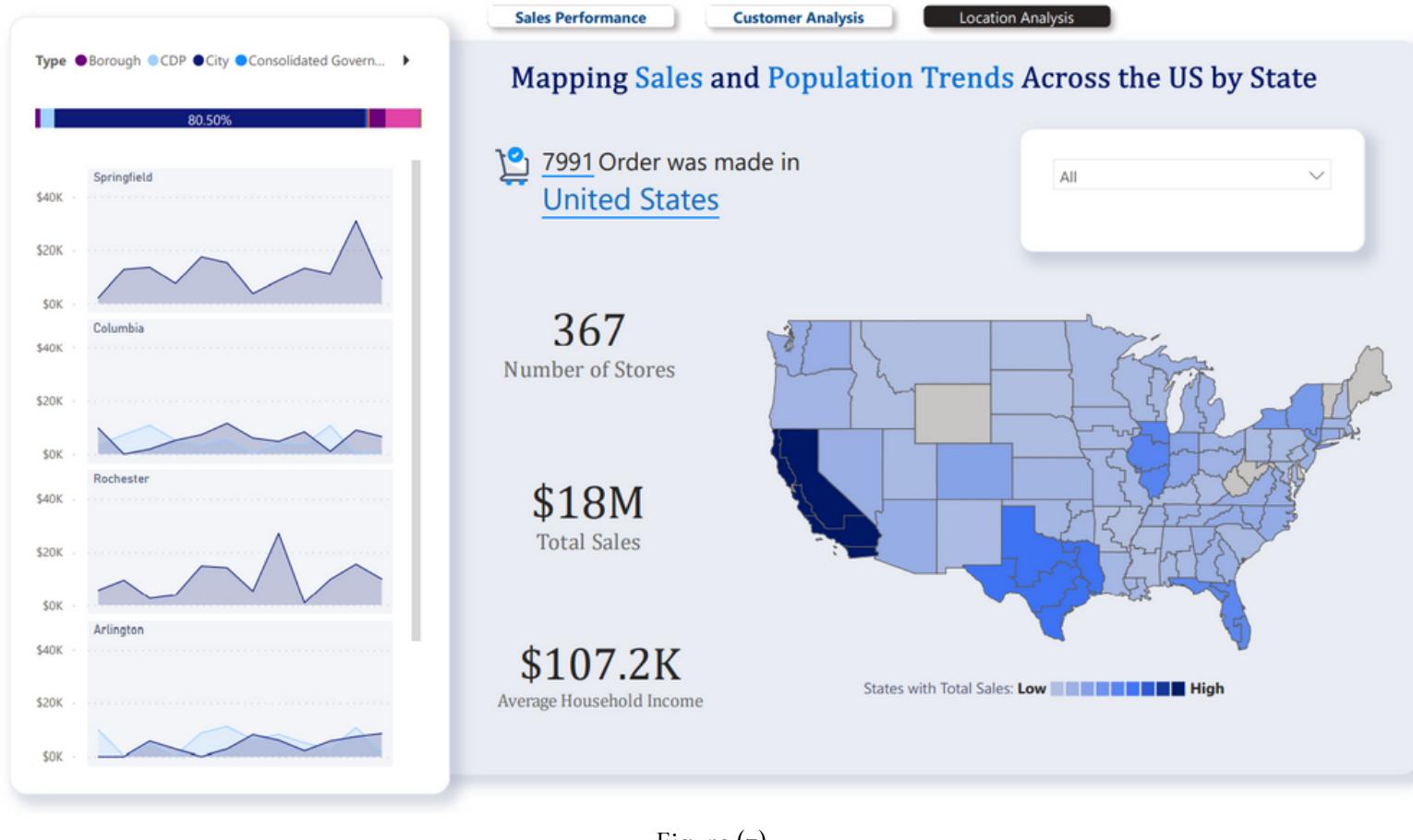


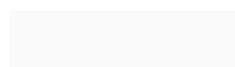
Figure (7)

The "Mapping Sales and Population Trends Across the US by State" dashboard shown in Figure (7), is an interactive data visualization tool that provides insights into location analysis through the examination of sales trends.

A slicer is included which enables the user to filter the entire dashboard by state, allowing for more focused analysis of specific regions.

To further enhance the data analysis capabilities of the dashboard, an interactive text feature is included to show the number of orders by state, enabling the user to understand the relative popularity of a state in terms of sales.

for the whole country, the company has mad 18 millions dollars over the time period.



Type ● Borough ● CDP ● City ● Consolidated Govern... ▶

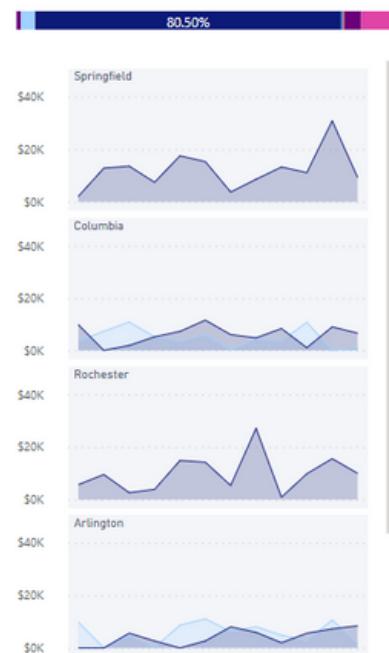
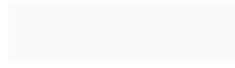


Figure (8)

This chart has uncovered that November is the topmost selling month in Springfield while January is the undermost selling one.



Location Analysis dashboard employs a map too, Figure(9), a highly effective visual representation of geographic data, to display the sales and population trends across the US by state in a visually compelling manner.

Additionally, the shape map utilizes variations in color intensity to signify Sales density, in this case, it shows that the state with maximum sales is California.

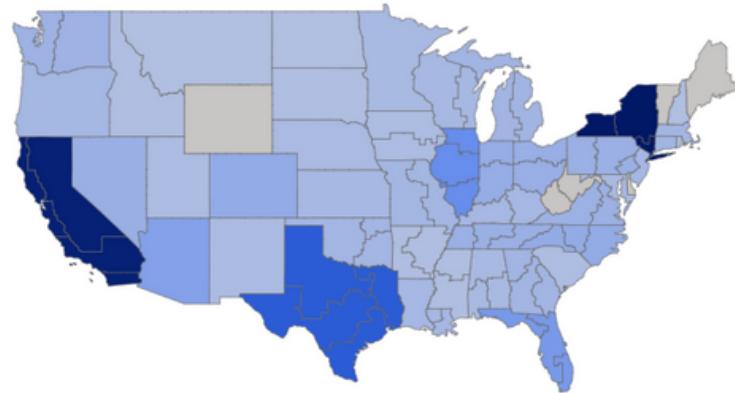


Figure (9)

This method of representing data allows the user to easily spot regions with high sales levels, areas of potential growth, as well as areas that may need more attention and resources.

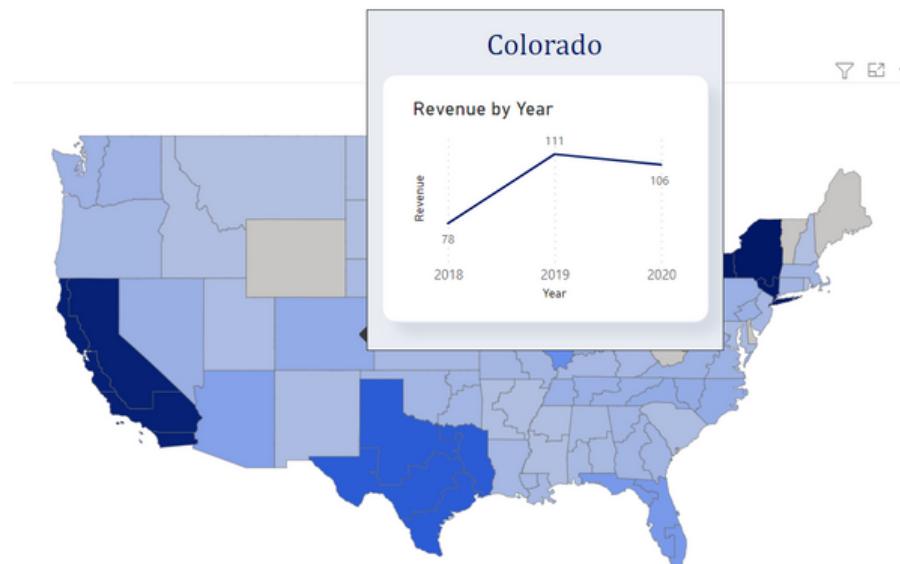


Figure (10)

The dashboard has been enhanced with the addition of a tooltip feature to the map visual. The tooltip, see Figure (10), which is activated when the user hovers over a specific state on the map, provides additional context and information about that state's revenue by year.

3.CONCLUSIONS

In conclusion, the main objective of this report was to analyze sales and customer trends using a dataset of internally sourced data and identify opportunities for improvement using Power BI dashboards.

The analysis focused on identifying trends in sales performance, understanding customer behavior and sales trends, and examining the geographic distribution of sales data. The use of Power BI tools allowed for the creation of clear and visually compelling dashboards that provided valuable insights into sales performance and customer behavior.

3.1.Recommendations

- To improve sales performance for underperforming teams, it is recommended to add more motivational elements to their strategy such as incentives for meeting sales targets, providing training and development opportunities, and implementing a recognition program for top performers.
- Increase the company's online visibility and reach by implementing targeted digital marketing campaigns, utilizing social media platforms, and offering online exclusive promotions or discounts.
- Focus on states with low average household income and offer products or services that are more affordable and better suited to this demographic.

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