DATA VISUALIZATION PROJECT REPORT

CUSTOMER ANALYSIS

Submitted by

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INT233

Under the Guidance of

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INDEX

TABLE OF CONTENTS

DECLARATION

I, N Yashashwin, student of Bachelor Of Technology under CSE/IT Discipline at, Lovely Professional University, Punjab, hereby declare that all the information furnished in this project report is based on my own intensive work and is genuine.

Date: 08-042023 Signature - Yashashwin

Registration No - 12017921 Name of the student –Yashashwin

CERTIFICATE

This is to certify that N Yashashwin bearing Registration no. 12017921 has completed INT233 project titled, **"CUSTOMER ANALYSIS"** under my guidance and supervision. To the best of my knowledge, the present work is the result of his/her original development, effort and study.

Tanima Thakur 23532

Senior Professor

School of Computer Science And Engineering

Lovely Professional University

Phagwara, Punjab.

Date: 09-04-2023

Acknowledgement

I would like to express my gratitude towards my university for providing me the golden opportunity to do this wonderful project regarding Creating a dashboard and visualizing

Firstly, I would like to thank my course instructor, Tanima Thakur for providing me with the necessary guidance and resources to undertake this project. Her knowledge and valuable feedback were instrumental in shaping my approach to this study.

I would also like to extend my appreciation to the Kaggle website who provided their data for this analysis. Without their willingness to share their information, this report would not have been possible.

Furthermore, I would like to acknowledge the developers of Tableau software for creating such an innovative and user-friendly tool that enabled me to analyze the data effectively. The technical support team at Tableau was also a great help in resolving any issues that I faced while working with the software.

Finally, I would like to thank my family and friends for their unwavering support and encouragement throughout my academic journey. Their motivation has been a constant source of inspiration for me.

INTRODUCTION

In the current business landscape, the importance of understanding customers cannot be overstated. Analyzing customer behavior and preferences can help companies make informed decisions, boost customer satisfaction, and ultimately increase revenue. However, with the sheer volume of customer data generated every day, making sense of it all can be a daunting task.

Fortunately, Tableau provides a solution. As a powerful data visualization tool, Tableau allows businesses to analyze data visually, enabling them to make quicker and better-informed decisions. By creating interactive dashboards and reports, businesses can uncover valuable insights about their customers and make data-driven decisions.

This report focuses on using Tableau to analyze customer data and gain a deeper understanding of customers. Through this analysis, we will explore customer demographics, purchase behavior, and satisfaction levels to identify opportunities for growth and improvement. The insights obtained will help us enhance our customer experience and drive business success.

The report will provide an overview of our customer analysis, highlighting key findings and recommendations for future action. By leveraging these insights, we aim to create a more meaningful and engaging experience for our customers. Ultimately, our goal is to use data-driven insights to enhance customer satisfaction and drive business growth.

SCOPE OF ANALYSIS

The scope of this report is to analyze customer data using Tableau to gain insights into customer behavior, demographics, purchase patterns, and satisfaction levels. The analysis will be based on data collected over the past year and will cover the following areas:

Customer demographics: We will analyze customer data to understand the demographics of our customer base, including age, gender, income, and geographic location. This analysis will help us understand who our customers are and tailor our marketing strategies accordingly.

Purchase behavior: We will analyze customer purchase data to identify patterns and trends in customer spending. We will explore factors such as the time of day, day of the week, and seasonality to understand how these factors impact customer purchase behavior. This analysis will help us optimize our pricing strategies and promotions.

Customer satisfaction: We will analyze customer feedback data to understand how satisfied our customers are with our products and services. We will explore factors such as product quality, customer service, and delivery times to identify areas for improvement. This analysis will help us improve our customer experience and retain customers.

Customer segmentation: We will segment our customers based on their behavior, demographics, and satisfaction levels to better understand their needs and preferences. This analysis will help us tailor our marketing and sales strategies to specific customer segments.

EXISTING SYSTEM

Tableau is a powerful data visualization tool that enables businesses to analyze and visualize their customer data in real-time. With Tableau, businesses can create interactive dashboards and reports that provide insights into customer behavior, preferences, and needs.

One of the key features of Tableau is its ability to integrate with a wide range of data sources, including customer relationship management (CRM) systems, social media platforms, and website analytics tools. This enables businesses to gather data from multiple sources and create a comprehensive view of their customers.

Tableau also provides businesses with the ability to create customized dashboards and reports that can be tailored to their specific needs. These dashboards can be used to track customer interactions, monitor customer sentiment on social media, and analyze customer demographics and behavior.

Another key feature of Tableau is its ability to create predictive models using machine learning algorithms. This enables businesses to predict customer behavior and tailor their marketing strategies accordingly.

Overall, Tableau is a powerful tool for customer analysis that enables businesses to gather and analyze customer data in real-time, providing valuable insights that can be used to enhance the customer experience and drive business growth.

SOURCE OF DATA SET

For this report on customer analysis, we have used a dataset from Kaggle. Kaggle is an online platform that hosts a wide range of datasets that can be used for data analysis and machine learning.

The dataset we have used for this analysis is the "Online Retail Data Set" from Kaggle. This dataset contains transactional data of a US-based online retail store. It includes data on revenue per state, product sales, and customer demographics.

We imported the dataset into Tableau and used its data visualization features to analyze customer behavior and preferences. We created customized dashboards that provide insights into customer demographics, sales trends, and customer purchasing habits.

One of the key insights we gained from this analysis is that the majority of the store's customers are located in the US. Which is typical for the retail industry due to the holiday season.

We also used Tableau's machine learning capabilities to create a predictive model that can forecast customer purchases. This model is based on historical customer transaction data and can be used to predict future customer behavior.

Overall, the use of Kaggle datasets and Tableau's data visualization and machine learning capabilities enabled us to gain valuable insights into customer behavior and preferences. These insights can be used to create more effective marketing strategies and enhance the customer experience.

https://www.kaggle.com/datasets/yashaswinnizampuram/customer-analysisxyz

ANALYSIS ON DATASET

Objective 1 : Revenue Per Month

Introduction :

One of the key metrics used in customer analysis is revenue per month. Revenue per month is a measure of the total revenue generated by a business in a given month. This metric is important because it provides insights into the financial performance of the business and helps identify trends and patterns in sales.

In the customer analysis dashboard, the revenue per month metric is used to analyze the sales trends of a business over a period of time. By tracking the revenue per month, businesses can identify which months generate the most revenue and which months have lower sales.

Analyzing revenue per month can also help businesses identify the factors that contribute to changes in sales trends. For example, a sudden increase in sales during a particular month may be attributed to a successful marketing campaign or a new product launch.

In the customer analysis dashboard, the revenue per month metric is displayed using line chart, to enable businesses to quickly identify trends and patterns in sales. By analyzing revenue per month, businesses can make data-driven decisions to optimize their sales and revenue performance.

Overall, the revenue per month metric is a critical component of the customer analysis dashboard, providing valuable insights into the financial performance of a business and helping to identify trends and patterns in sales.

General description:

Revenue per month is a key metric used in customer analysis dashboards to track the sales performance of a business over a period of time. This metric provides insights into the financial performance of the business and helps identify trends and patterns in sales.

The revenue per month metric represents the total revenue generated by a business in a given month. By tracking revenue per month, businesses can analyze their sales trends and identify which months generate the most revenue and which months have lower sales.

Visualizing revenue per month in a dashboard allows businesses to quickly identify trends and patterns in sales performance. Line charts or bar graphs are often used to display revenue per month data, making it easy to see changes in sales trends over time.

Analyzing revenue per month can also help businesses identify the factors that contribute to changes in sales trends. For example, a sudden increase in sales during a particular month may be attributed to a successful marketing campaign or a new product launch.

Specific Requirements, functions and formulas:

1.Connect to the Customer analysis in Tableau Desktop.

2.Drag the "Revenue" dimension to the Rows shelf.

3.Drag the "Month" measure to the Columns shelf.

4.Change the mark type to "Line Chart" by clicking on the "Automatic" mark type in the Marks card and selecting "Bar".

5.Drag the "Revenue" dimension to the Color shelf.

6.Click on the drop-down arrow in the Color shelf and select "Red-Green" as the color.

7.Adjust the size of the bars as desired. Add any necessary labels or titles to the graph.

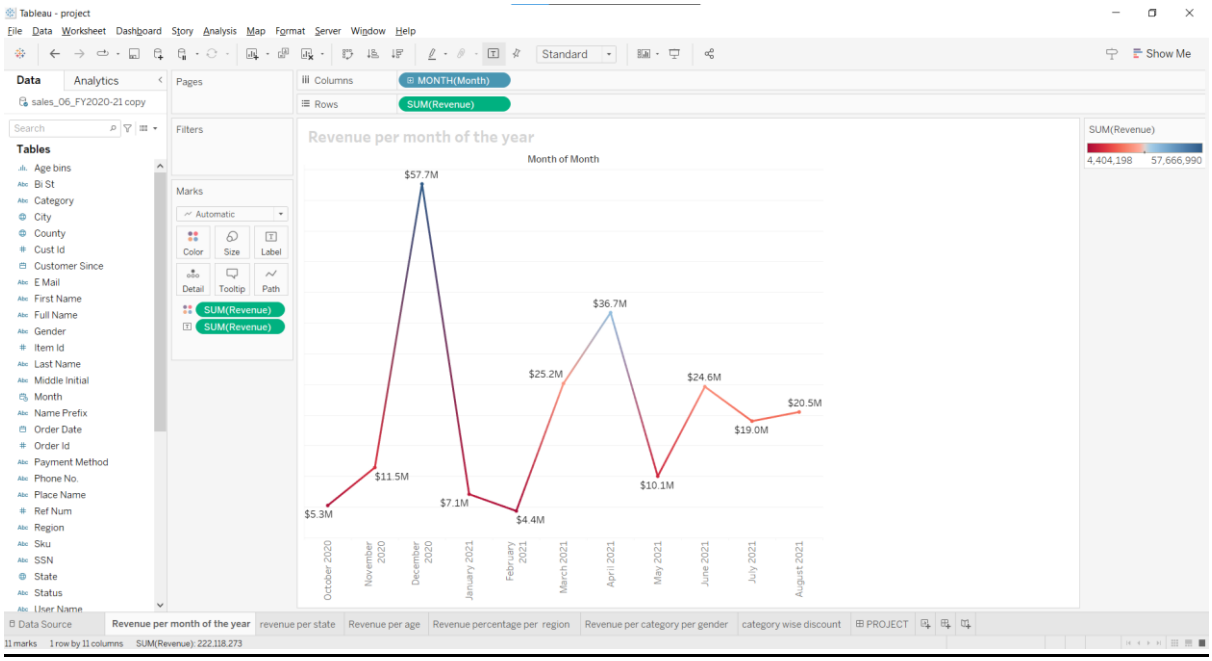
Save and share the visualization as desired.

Analysis Results:

The line graph shows literacy revenue vs month from the data.

Sum of revenue per date. Color shows sum of revenue. Dark blue shows the highest revenue and dark blue shows the lowest revenue the which color goes denser we get to the increased or decreased of revenue. The trend of sum of Revenue for Month. Color shows sum of Revenue. The marks are labeled by sum of Revenue.

Visualization:



Objective 2: Revenue per state

Introduction:

In addition to revenue per month, revenue per state is another important metric used in customer analysis dashboards. This metric provides insights into the geographical distribution of a business's revenue and helps businesses identify regions where they may need to focus their sales efforts.

The revenue per state metric is a measure of the total revenue generated by a business in each state or region where the business operates. By analyzing revenue per state, businesses can identify which states generate the most revenue and which states have lower sales.

Analyzing revenue per state can also help businesses identify the factors that contribute to changes in sales trends in different regions. For example, a sudden increase in revenue in a particular state may be attributed to a growing customer base in that region or a successful marketing campaign targeted at customers in that state.

In the customer analysis dashboard, revenue per state is typically displayed in a visual format, such as a map, to enable businesses to quickly identify which states generate the most revenue. This allows businesses to make data-driven decisions about where to focus their sales efforts and marketing campaigns.

General description:

Revenue per state is a crucial metric in customer analysis dashboards that helps businesses understand their sales performance in different regions. This metric provides insights into the geographical distribution of a business's revenue and helps businesses identify regions where they may need to focus their sales efforts.

The revenue per state metric measures the total revenue generated by a business in each state or region where the business operates. By analyzing revenue per

state, businesses can identify which states generate the most revenue and which states have lower sales.

Visualizing revenue per state in a dashboard allows businesses to quickly identify which states are generating the most revenue. This data can be displayed using a variety of visual formats, such as a map or bar chart, making it easy to see the differences in revenue generation across different regions.

Specific Requirements, functions and formulas:

Drag the country field to Rows and the population field to Columns.

Change the chart type to map by selecting "Map" from the "Show Me" panel.

Select "Filled Map" from the map options in the "Marks" card.

Drag the revenue field to the "Color" card in the Marks card.

In the "Color" card, select a red-green color palette.

Adjust the map to show the level of detail you want. You can zoom in and out, adjust the map layers, and adjust the size of the marks as needed.

Where I had formatted number to millions and added the $ currency

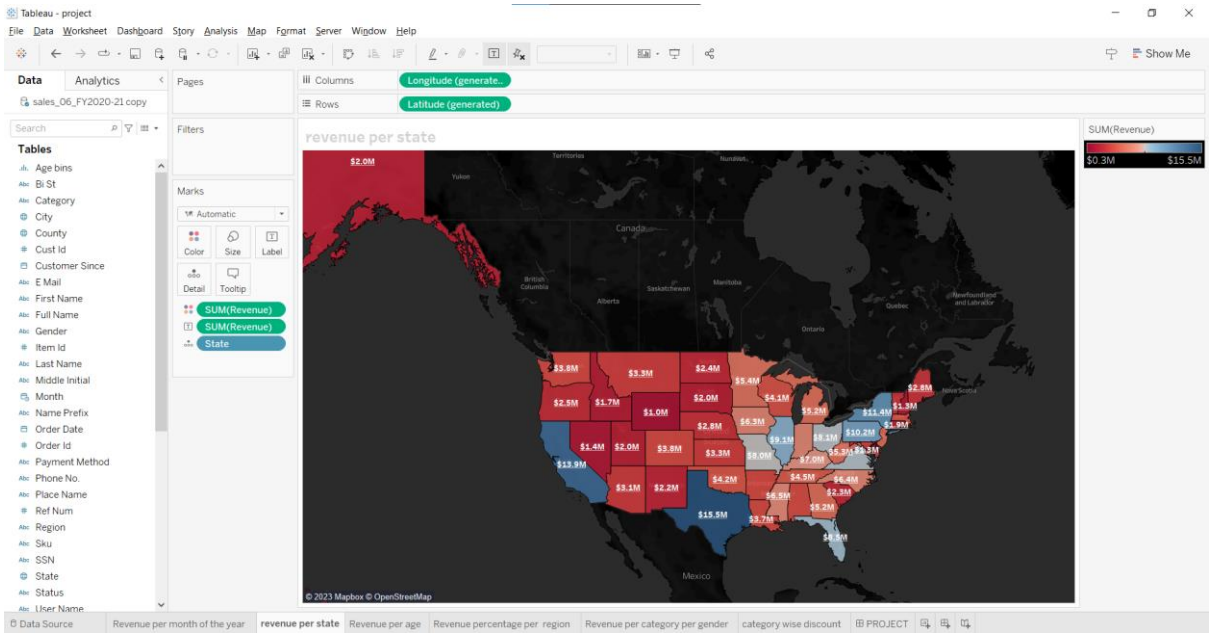
To add additional context to the visualization, you can add labels or tooltips to show the name of each country and its population.

Save the visualization and share it with others as needed.

Analysis Result:

Map based on Longitude (generated) and Latitude (generated). Color shows sum of Revenue. The marks are labeled by sum of Revenue. Details are shown for State. In which we get to know about from country “TX” we had got more revenue “$15.5M”.

Visualization:



Objective 3: Revenue per age

Introduction:

Revenue received per age is a critical metric used in customer analysis dashboards to understand the spending patterns of customers in different age groups. This metric provides insights into the age distribution of a business's revenue and helps businesses identify age groups where they may need to focus their sales efforts.

The revenue received per age metric measures the total revenue received by a business from customers in each age group. By analyzing revenue received per age, businesses can identify which age groups generate the most revenue and which age groups have lower sales.

Visualizing revenue received per age in a dashboard allows businesses to quickly identify which age groups are generating the most revenue. This data can be displayed using a variety of visual formats, such as a bar chart or pie chart, making it easy to see the differences in revenue generation across different age groups.

Analyzing revenue received per age can also help businesses identify the factors that contribute to changes in sales trends in different age groups. For example, a sudden increase in revenue received from a particular age group may be attributed to a successful marketing campaign targeted at customers in that age group.

General description:

Revenue received per age is a metric that provides valuable insights into the spending patterns of customers in different age groups. This metric helps businesses understand the age distribution of their revenue and enables them to identify the age groups that generate the most revenue. By analyzing revenue received per age, businesses can make data-driven decisions about where to focus their sales efforts and marketing campaigns.

Visualizing revenue received per age in a dashboard allows businesses to quickly identify which age groups are generating the most revenue. This data can be displayed using a variety of visual formats, such as a bar chart, making it easy to see the differences in revenue generation across different age groups.

Analyzing revenue received per age can also help businesses identify trends in spending patterns across different age groups. For example, younger customers may be more likely to spend on technology and entertainment products, while older customers may be more likely to spend on healthcare and financial services.

Specific Requirements, functions and formulas:

1.Connect to the Customer analysis set in Tableau Desktop.

2.Cretate bins for age give the size of 10 and edit alias

3.Drag the "Revenue" dimension to the Rows shelf.

4.Drag the "Age bins" measure to the Columns shelf.

5.Change the mark type to "Bar" by clicking on the "Automatic" mark type in the Marks card and selecting "Bar".

6.Drag the "Revenue" dimension to the Color shelf.

7.Click on the drop-down arrow in the Color shelf and select "red-blue" as the color.

8.Adjust the size of the bars as desired. Add any necessary labels or titles to the graph.

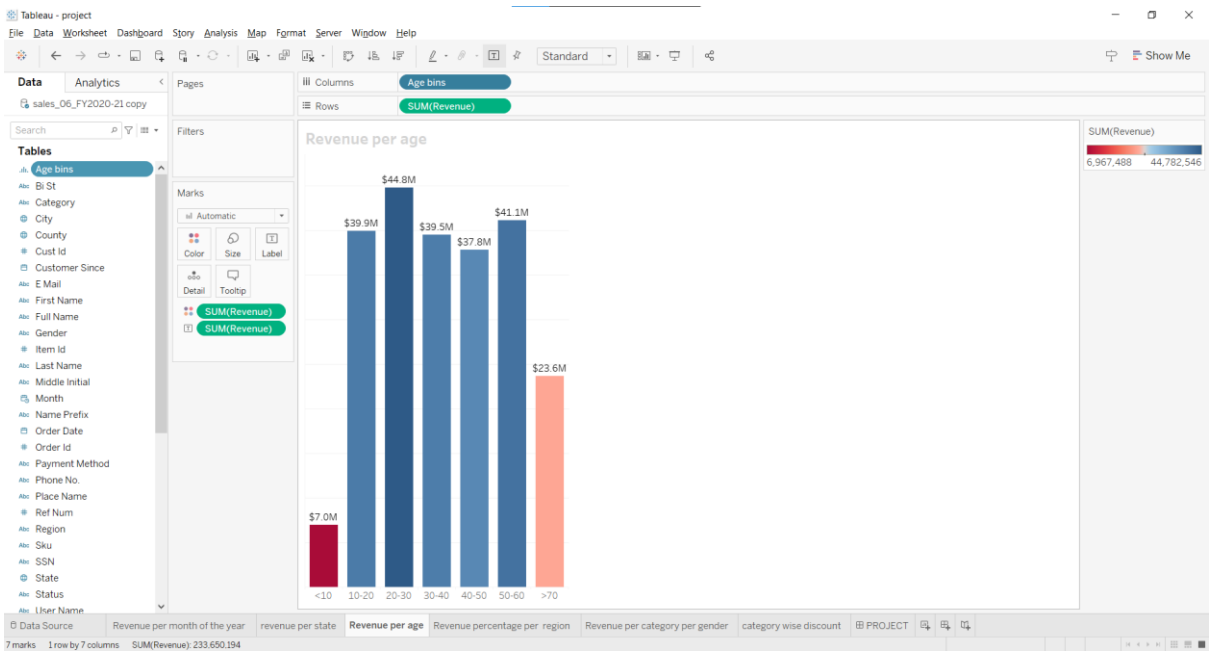
9. formatted number to millions and added the $ currency

Save and share the visualization as desired.

Analysis Result:

Sum of Revenue for each Age bins. Color shows sum of Revenue. The marks are labeled by sum of Revenue. In which we get to know that from the age group of 20-30 we had got more revenue “$44.8M”.

Visualization:



Objective 4: Revenue percentage per region

Introduction:

Revenue percentage per region is an important metric for any business as it helps to understand the distribution of revenue across different regions. This information is critical for decision-making processes, such as identifying areas of growth or potential challenges in specific regions. By analyzing the revenue percentage per region, businesses can identify which regions are performing well and which require more attention.

The revenue percentage per region can be calculated by dividing the revenue generated in a particular region by the total revenue generated by the business. This percentage provides an insight into the contribution of each region to the overall revenue.

In this customer analysis dashboard, the revenue percentage per region is an essential metric to track customer behavior across different regions. It will help to identify which regions are more profitable and what factors are contributing to that profitability. Additionally, it will enable businesses to make informed decisions about resource allocation and strategic planning.

General description:

Revenue percentage per region is a metric used to understand the proportion of revenue generated by a business from different regions. It indicates the relative importance of different regions in terms of revenue generation. By calculating revenue percentage per region, businesses can identify the regions that are generating the most revenue and those that need more attention.

Revenue percentage per region can be calculated by dividing the revenue generated in a particular region by the total revenue generated by the business and multiplying it by 100. This calculation provides a percentage that represents the share of total revenue generated by that particular region.

In the context of customer analysis, revenue percentage per region is an important metric for businesses to track as it helps to identify the regions where the most profitable customers are located. It can also provide insights into factors that may be impacting revenue generation in different regions, such as regional preferences or economic conditions.

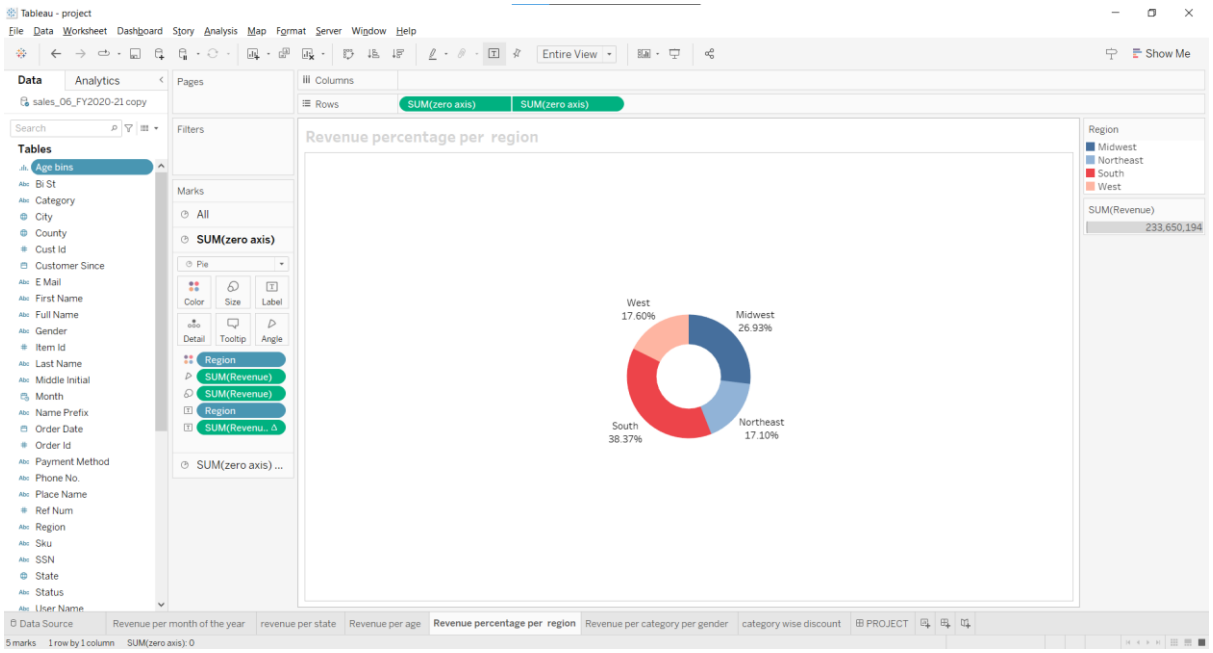
Specific Requirements, functions and formulas:

1. Drag the "Region" field to the "Columns" shelf.
2. Drag the "Revenue" field to the "Rows" shelf.
3. Click on the "Show Me" button on the top right corner of the screen and select the "Pie Chart" option.
4. A pie chart will be generated, showing the distribution of population increments across different countries.
5. On revenue click the drop down button and choose quick table calculation and choose total percentage.
6.To create a donut chart firstly, create a zero axis by creating calculated field. Drag the zero axis dimension to row twice
7. To customize the donut chart, from "Marks" card on the left-hand side of the screen and adjust various settings. Remove all the dimensions from second zero axis then decrease the size of the pie chart and right click on zero axis and click dual axis
8. Then Add any necessary labels or titles or colors to the chart.

Analysis Result:

Sum of zero axis and sum of zero axis. For pane Sum of zero axis: Color shows details about Region. Size shows sum of Revenue. The marks are labeled by Region and % of Total Revenue.

Visualization:



Objective 5: Revenue per category per gender

Introduction:

Revenue per category per gender is an important metric for businesses to understand customer purchasing behavior across different categories and genders. By analyzing revenue data in this way, businesses can gain insights into the products and services that are most popular among different genders and identify areas for growth and optimization.

The revenue per category per gender metric can be calculated by dividing the revenue generated by a particular category for a specific gender by the total revenue generated by the business. This calculation provides a percentage that represents the share of total revenue generated by that category and gender.

In this customer analysis dashboard, the revenue per category per gender metric will help to identify the most profitable product or service categories for each gender. This information can be used to tailor marketing campaigns to specific genders, optimize product offerings, and increase revenue.

General description:

The Revenue per Category per Gender dashboard is designed to provide insights into the purchasing behavior of customers based on their gender and the product categories they are interested in. By analyzing the revenue generated by each product category for both male and female customers, businesses can gain a better understanding of the preferences and buying patterns of their customers. This dashboard allows businesses to track the revenue generated by each product category, identify the most profitable categories, and optimize their marketing and sales strategies accordingly. With this information, businesses can tailor their promotions and advertising efforts to target specific product categories and genders, which can lead to increased revenue and customer satisfaction.

Specific Requirements, functions and formulas:

1.Connect to the Customer analysis set in Tableau Desktop.

2.Drag the "gender" and “category” dimension to the Rows shelf.

3.Drag the "revenue" measure to the Columns shelf.

4. Create a calculated field for both gender where for every gender revenue displayed separately not repeatedly twice. By using calculated field “IF [Gender] =’F’ THEN [Revenue] END” and “IF[Gender] = ‘M’ THEN [Revenue] END”.

5. Remove the revenue from column and gender from the row

6. Drag the "female" and “male” calculated feilds dimension to the column shelf. Add the zero axis dimension in between them and sort them.

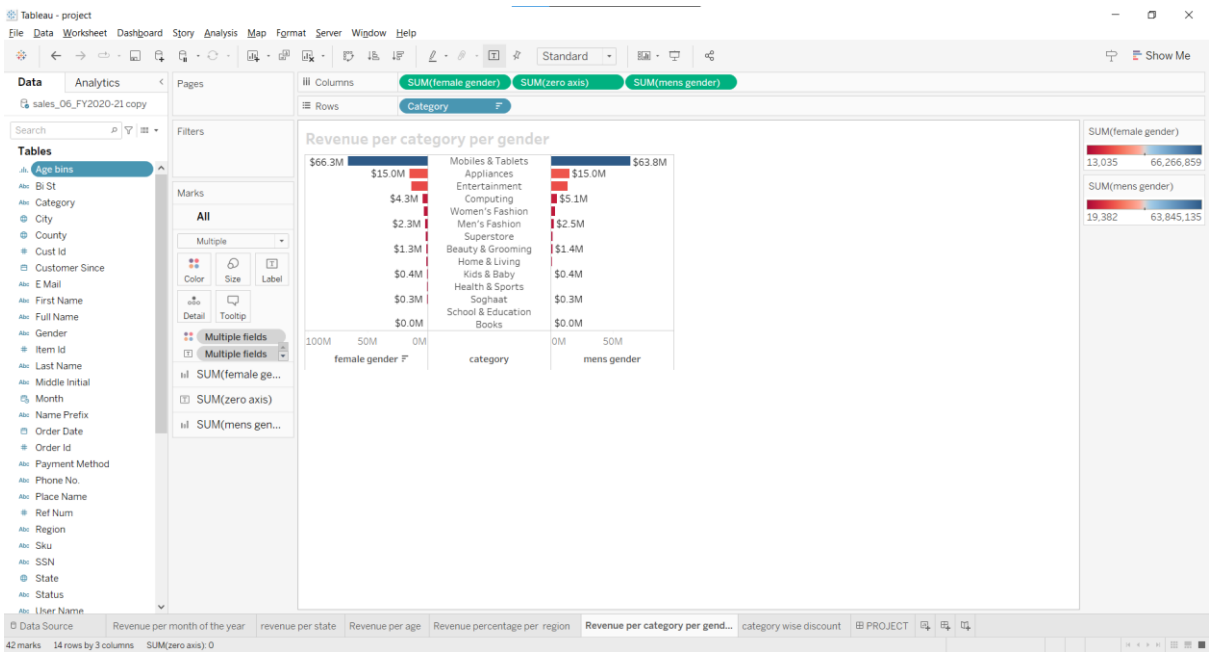
7. Adjust the size of the bars as desired. Add any necessary labels or titles or colors to the graph.

Save and share the visualization as desired.

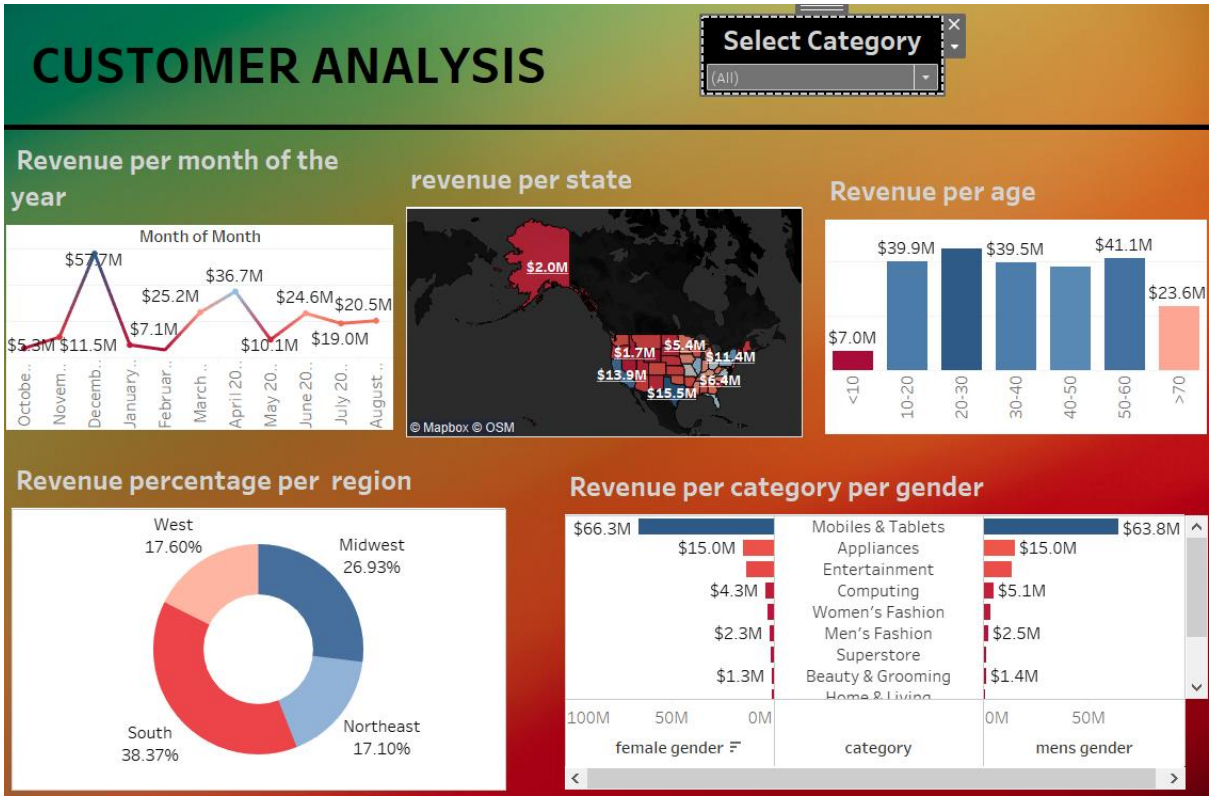
Analysis Result:

Sum of female gender, sum of zero axis and sum of mens gender for each Category. For pane Sum of female gender: Color shows sum of female gender. The marks are labeled by sum of female gender. For pane Sum of mens gender: Color shows sum of mens gender. The marks are labeled by sum of mens gender.

Visualization:



DASHBOARD


CUSTOMER ANALYSIS
Select Category
(All)
Revenue per month of the year
Month of Month
$5.3M
$11.5M
$7.1M
$25.2M
$36.7M
$10.1M
$24.6M
$19.0M
$20.5M
revenue per state
$2.0M
$1.7M
$5.4M
$11.4M
$13.9M
$6.4M
$15.5M
© Mapbox © OSM
Revenue per age
$7.0M
$39.9M
$39.5M
$41.1M
$23.6M
<10
10-20
20-30
30-40
40-50
50-60
>70
Revenue percentage per region
West
17.60%
Midwest
26.93%
South
38.37%
Northeast
17.10%
Revenue per category per gender
$66.3M
$15.0M
$4.3M
$2.3M
$1.3M
Mobiles & Tablets
Appliances
Entertainment
Computing
Women's Fashion
Men's Fashion
Superstore
Beauty & Grooming
$63.8M
$15.0M
$5.1M
$2.5M
$1.4M
100M
50M
0M
female gender
category
0M
50M
mens gender

FUTURE SCOPE

Incorporating Predictive Analytics: The future scope of the Customer Analysis Dashboard using Tableau involves incorporating predictive analytics to gain a better understanding of customer behavior. By analyzing customer data and patterns, businesses can predict future trends and make data-driven decisions accordingly. With the help of advanced analytics tools, businesses can develop models to predict customer behavior, preferences, and trends.

Integrating Social Media Analytics: Social media has become an essential part of businesses' marketing strategies. Integrating social media analytics into the Customer Analysis Dashboard using Tableau can provide businesses with insights into customer sentiment, preferences, and feedback. This data can help businesses improve their products and services, and develop effective marketing campaigns.

Improving Data Visualization: While the Customer Analysis Dashboard using Tableau provides rich visualizations of customer data, there is always room for improvement. In the future, businesses can leverage advancements in data visualization techniques to create more intuitive and user-friendly dashboards. This can help businesses better understand customer behavior and make informed decisions.

REFERENCES

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2. https://www.youtube.com/watch?v=EcZH58cFMWw

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