Data Visualization

DATA-230

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MS - Data Analytics

Overview

For this exercise, I use the customer-sales data for 12 months. The data have multiple attributes related to customer demographics and sales patterns. I used tableau as my primary tool to build this dashboard. In the dashboard I used multiple charts like (bar-chart, donut-chart, geographical map etc.) With this dashboard I tried to highlight key aspects of the data

Goals

1. Overview of all the sales metrics highlighting total orders, total sales etc.
2. Since this data has only USA demographics, I used a geo-spatial chart to highlight areas with strong demand and other areas with more opportunities.
3. I also presented the customer purchase pattern for different demographics like age and gender.
4. Help to understand the customer demand throughout the year and drill down to specific months.
5. Sales revenue coming from different categories.
6. Impact of discount on customer behavior.

Tools and dataset -

Tools-

For this exercise, I mainly used Tableau with some data transformation inside the tableau using calculated fields..

Dataset -

For this exercise, I used two datasets -

1- “sales_06_FY2020-21.csv”, since the data was very big so I chose only 100K records.

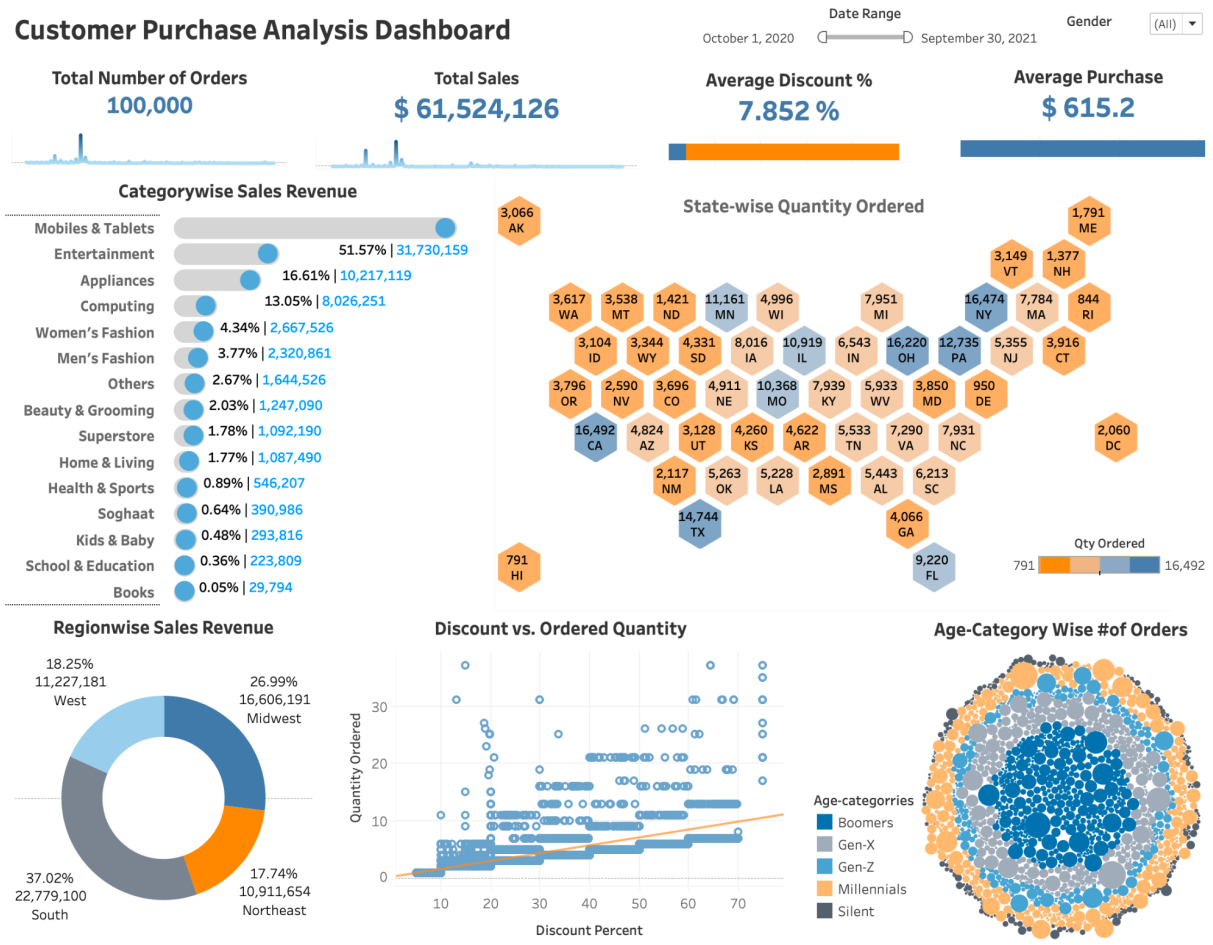
2- US states mapping , for grid formation, so that I can represent each state without overlapping with each other.

Dashboard -

Here is the screenshot of the full dashboard. In the next sections we will explore each individual chart and their corresponding details. Throughout the chart I used following Gestalt's principles

- Principle of Similarity and Proximity (bubble chart)
- Principle of Continuity (bar chart)
- Principle of Focal point (each item in the dashboard have the selection feature)

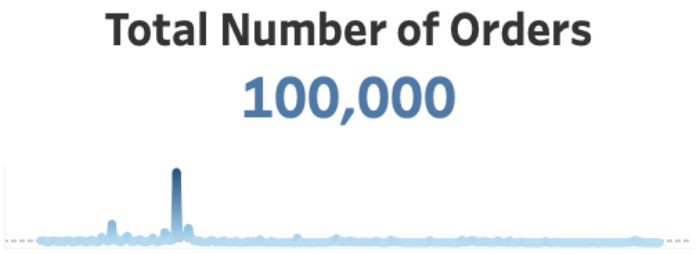
With all the given information and filters, it will be easier to see various aspects of the data.



Top Header KPIs -

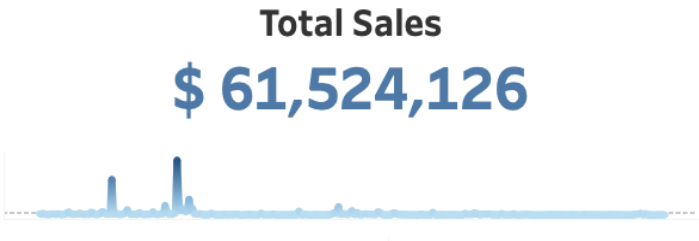
I. Total Number of Orders -

It's one of the KPIs highlighting the total number of orders. Since it's just for informational purposes, I did not put much details. On top the highlighted number is the total number of orders and, there is a time series chart below the actual total orders. It also represents the number of orders for the given time period. The Y-axis of the time series chart represents the "total number of orders" for a given date. I also used gradient shading for the line chart where higher value represents higher number of orders.



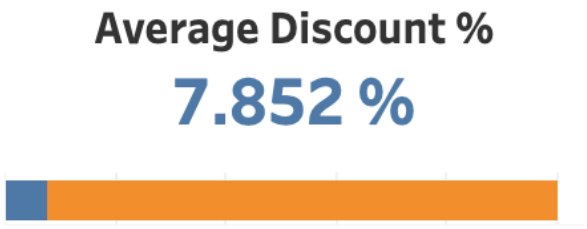
II. Total Sales -

It's one of the KPIs highlighting the total sales revenue. On top the number represents the total sales revenue and there is a time series chart below the actual total sales in USD. It represents the number of orders for the given time period. The Y-axis of the time series chart represents the "total sales in USD" for a given date. I also used gradient shading for the line chart where higher value represents higher total sales.



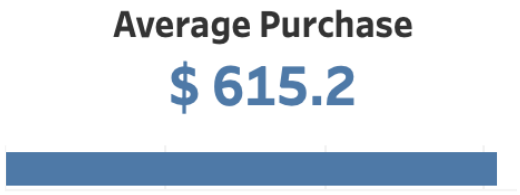
III. Average Discount -

This KPI represents the average discount for the selected time period. The full bar length represents 100 and the section in blue shows the actual discount. I choose blue color to show the discount



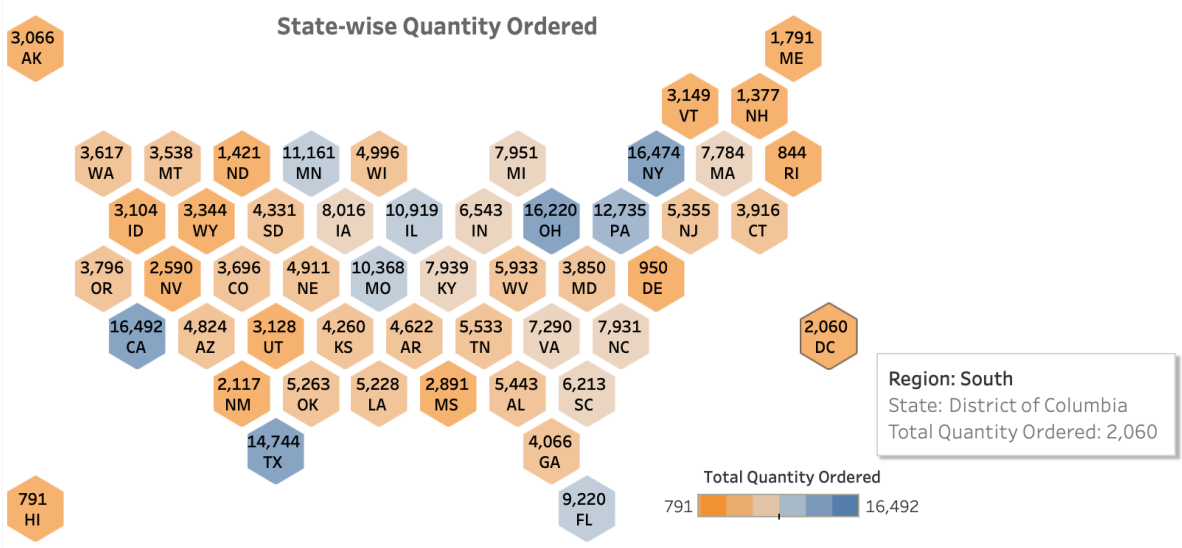
IV. Average Purchase Amount -

This KPI shows the average purchase amount for a given order. This value will change as any of the filters in the top right corner changes.



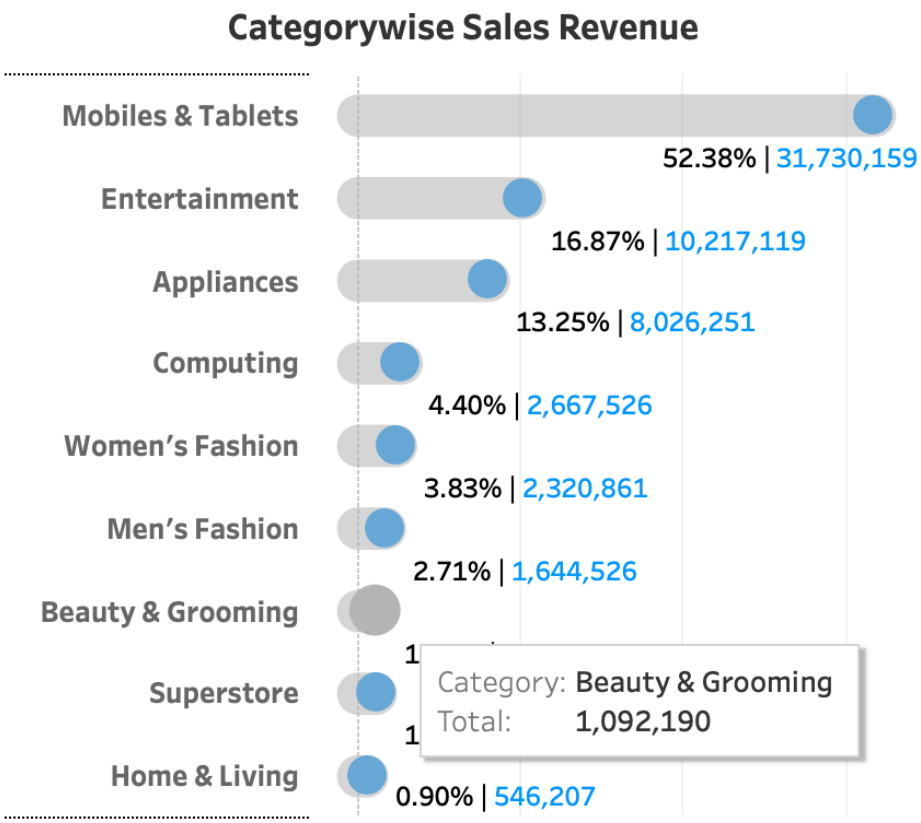
State-wise Quantity Ordered -

To represent this information, there is a need for a geospatial chart. Here I am using a representational map of the USA, because in a normal USA map the northeastern states are hard to see and we cant see the full information. In this chart each state is represented by a hexagon and I put the State-Abbreviation to identify that. On hover we can see the state Full name and which region it belongs to. I also put the total ordered quantity ordered. Here I am using the color encoding to highlight low and high values. I also added an interaction for the selected state. If we select any state on the map whole dash-board will change and show all the values for the state.



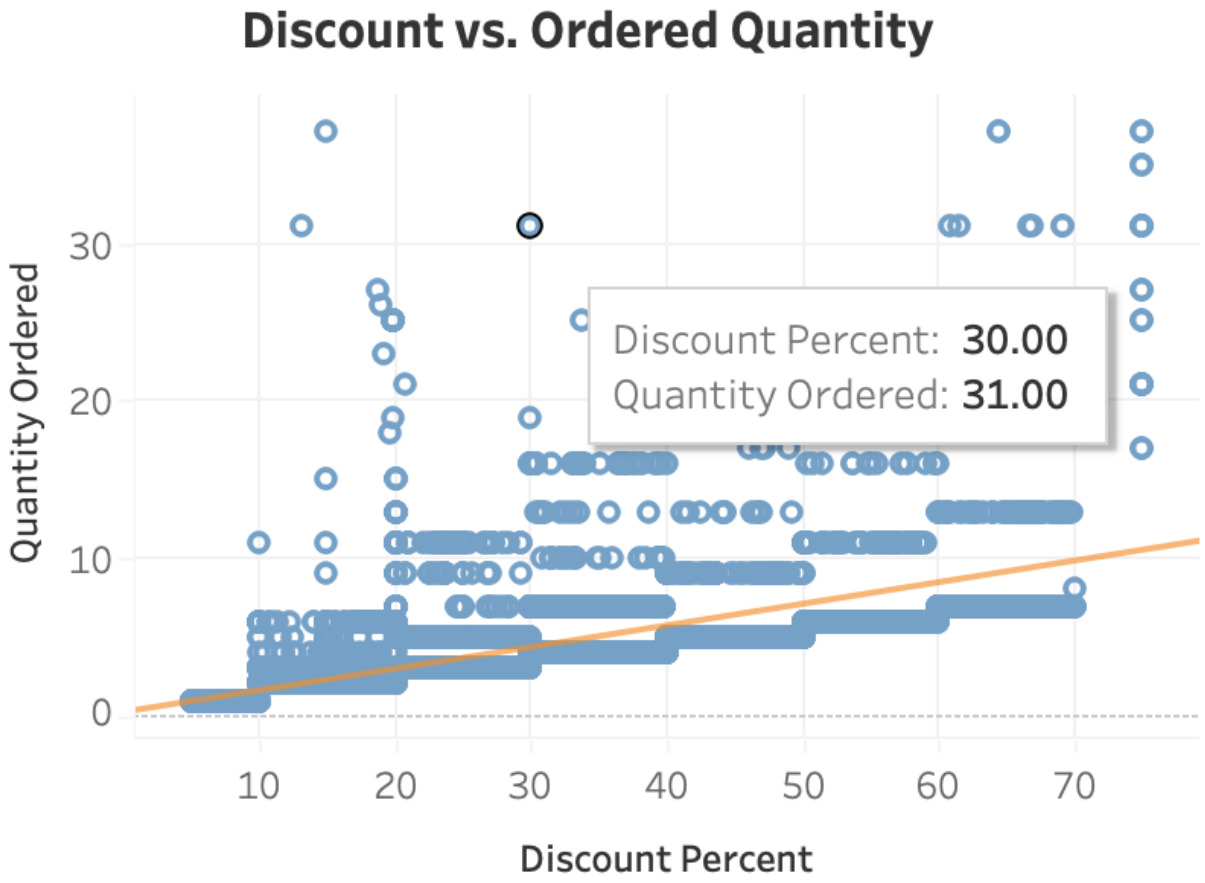
Category-wise Sales Revenue -

Here I am using the horizontal bar chart to represent each product category. We have many product categories, if we use the vertical bar chart it would be difficult to read all of those. On the top of that we are also showing their fraction in the revenue and total revenue. That's why I chose the horizontal bar chart. I sorted all bars in decresing order (Gestal's continuity principle).



Discount vs. Ordered Quantity -

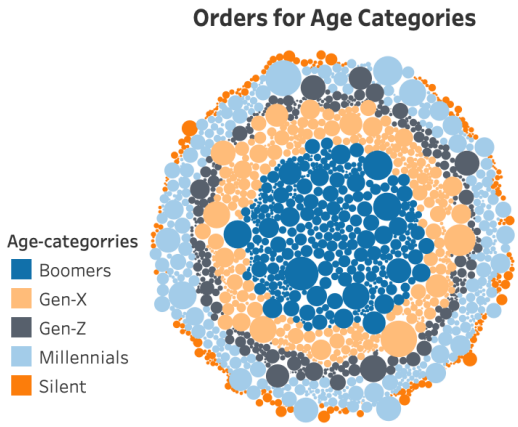
This chart represents the customer's behavior. There were frequent discounts by the seller, as we can clearly see that as the discount increases, the customers tend to order more quantities. I chose a scatter plot to highlight that. Since we don't know about the correlation and as we apply more filters, then this behavior will change with that. I also added a trend line to highlight the trend.

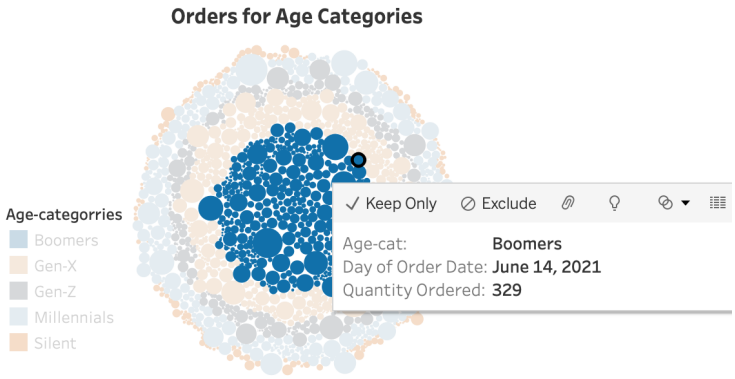


Age-wise Sales Revenue -

In the data we have many ages, so I converted the ages into 5 categories. Gen-Z (<=26), Millennials (26-40), Gen-X (55-40), Boomers (55-70) and Silent (70+), that will help us visualize the data. Each of the colors represents a different category. Each bubble represents a purchase and the size of the circle represents Number of Items ordered in each order. The color palette is from tableau's Color Blind Compatible color.

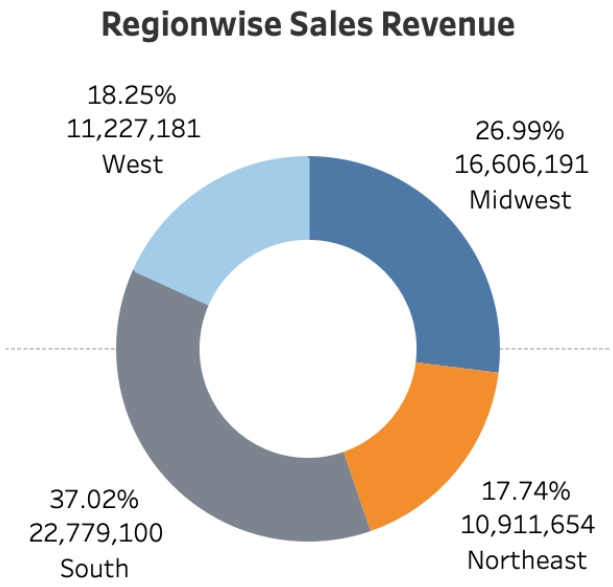
All the similar items are grouped together with the same color (Gestal's Proximity and Similarity and Focal point principles).



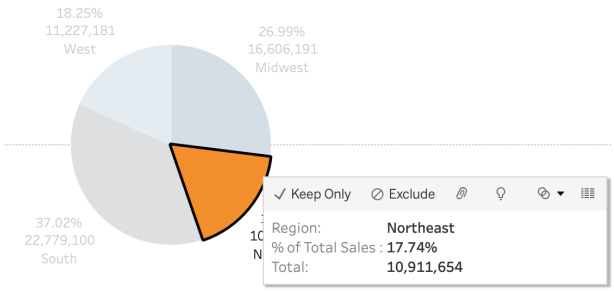


Region-wise Sales Revenue -

I used a donut chart to show the region wise performance of the sales. Since there are 4 regions only, I used the label near the colored area. I also added more information line contribution of the region in the total revenue and total revenue. Since there are multiple colors, I used Tableau's Color Blind palette to pick 4 colors which can be easily identified.



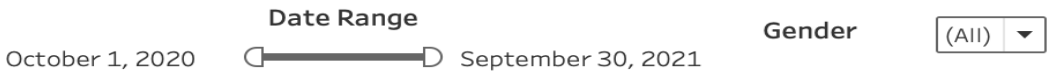
Highlighted section of a region. It uses Gestalt's principle of Focal Point.

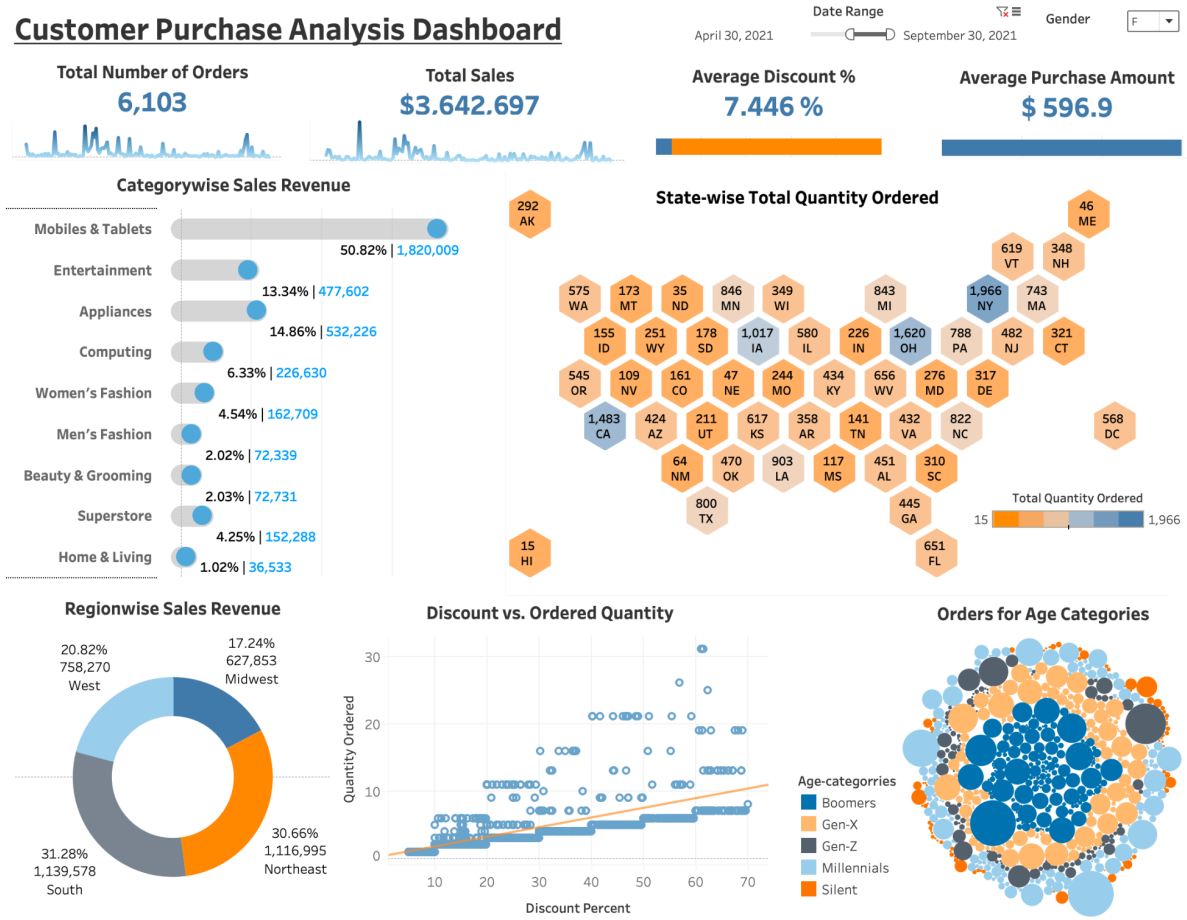


Interactions -

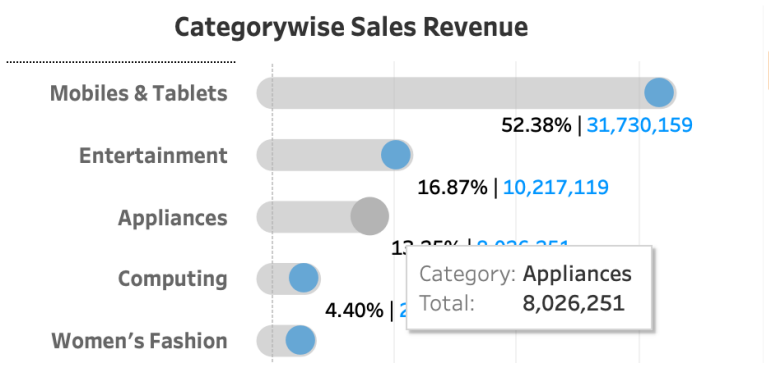
I added multiple interactions throughout the dashboard.

1 - Filters - At the right top of the dashboard, I added two filters. On changing the values, the entire chart will change to represent the selection.





2 - Mouse Hovers - I added the mouse hover to every element in the dashboard which shows more detailed information.



3- Map Selection - On choosing any State in the Map-Chart, the entire dashboard will be filtered for the same.