I.   Objectives

- To design an interactive dashboard that provides insights.
- Build various display areas and display types along with interactions.
- Designing a good user interface.
- Employ graphic design principles within the dashboard.
- Include Gestalt principles in the dashboard design.

II.   Dataset Description

The dataset used for this project is Online sales in the USA, taken from Kaggle. It is a csv file and contains sales of several products, merchandise and electronics etc., across several regions within the US. This is a rich dataset with 36 fields including both continuous and categorical features and more than 280k records. The dataset is already preprocessed and does not contain any null values or duplicated records.

III.   Dashboard Overview

The dataset is loaded into Tableau Desktop and several Worksheets and Dashboards are created to achieve the objectives. A dashboard **Home Screen** was designed as a central page with buttons linking to all the other dashboards related to each sub-section. Apart from Home Screen, there are 4 other dashboards each one for a sub-section.

- Home Screen
- Customer Statistics
- Regional Statistics
- Order Statistics
- Sales Statistics

Below is the overview of each of the dashboard.

A. Home Screen

The links to the other four buttons - created pages are located on the main page. By clicking(*Alt+Click*) the link, we can navigate to the relevant dashboards. In each dashboard, there is a ***Back*** button to navigate back to HomeScreen. This interaction was made possible by the usage of buttons and active links(Navigation). The image on the home page was carefully selected with the subject and presentation in mind. The home page now reads, '**Online Sales Dashboard'.** The constructed home page is shown below.
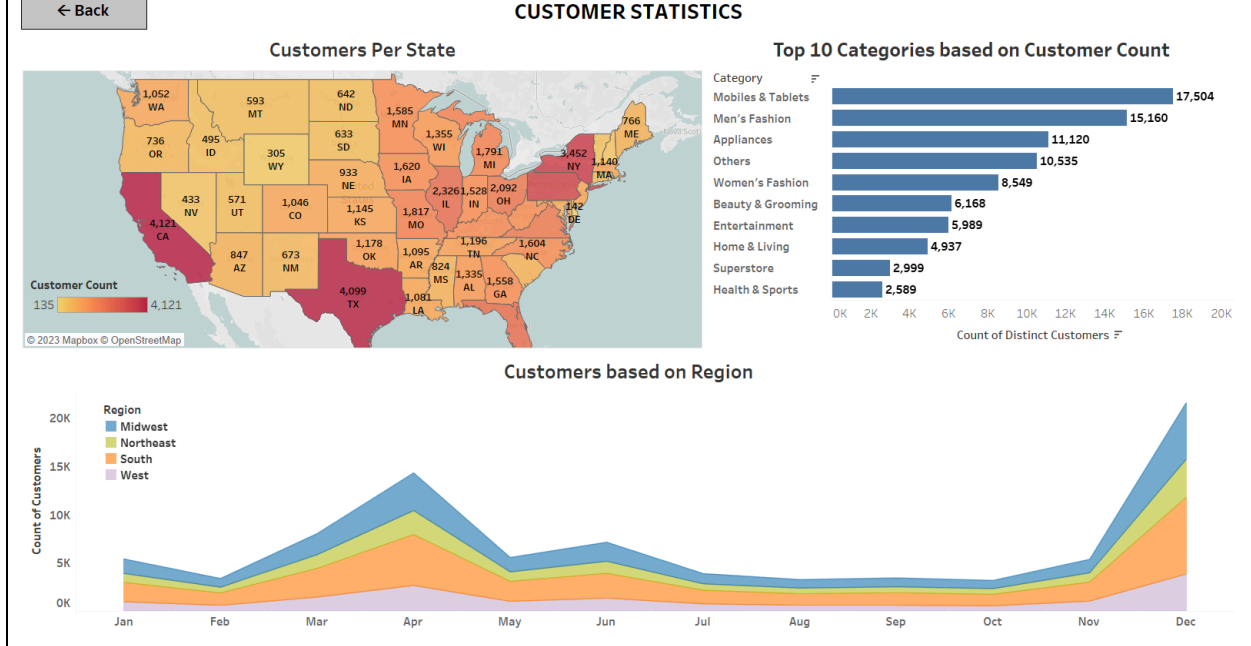

Home Screen Dashboard

B. Customer Statistics

This dashboard displays information about Customers according to state, region and others. There are three worksheets linked in this dashboard

    a. Customers per State (*GeoSpatial Map*)

    b. Top 10 categories with highest customers (*Bar Graph*)

   c. Number of customers based on region monthly (*Area Chart*)

Here, the Geo map acts as an interactive filter where on selecting each state, we get drilled down analytics of each state within that page.

Customer Statistics Dashboard

C. Regional Statistics

This dashboard contains three worksheets related to Orders.

    a. Total Orders per State (*Geospatial Map*)

    b. Total Orders in each category (*Bar Graph*)

    c. Total Orders depending on region (*Horizontal Bar Graph*)

There are two interactive filters employed here - one in Geomap to filter as per state, other to select the category of products. Below screenshot shows the insights with both filters applied arbitrarily.
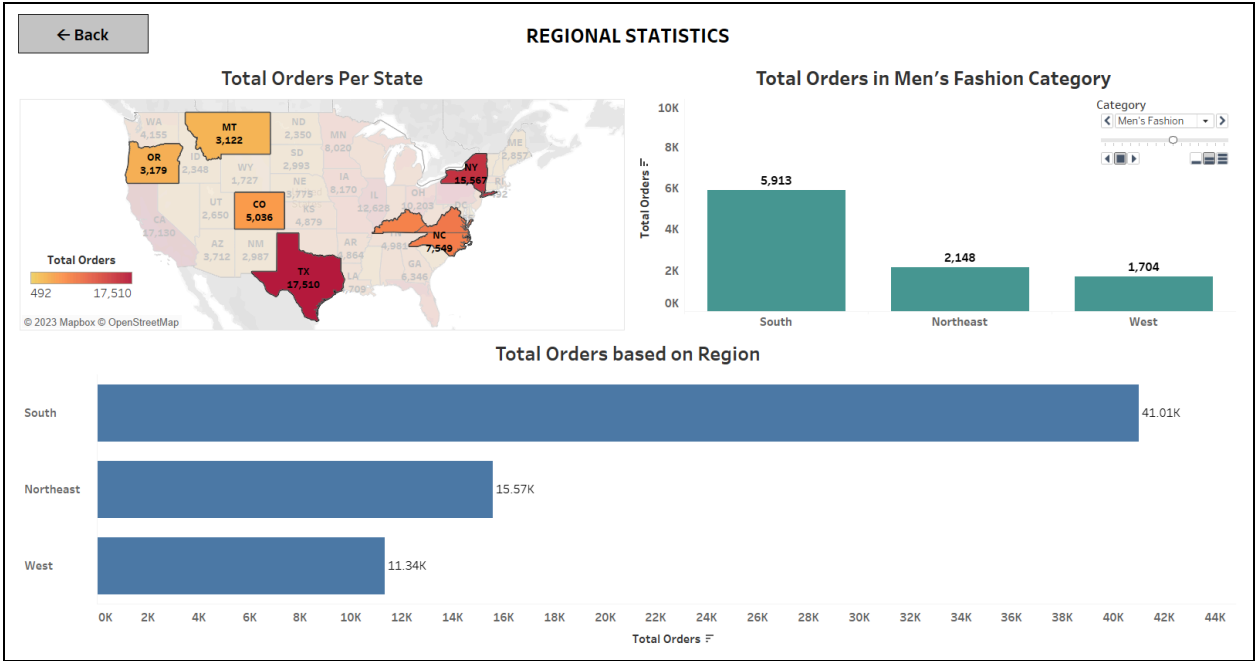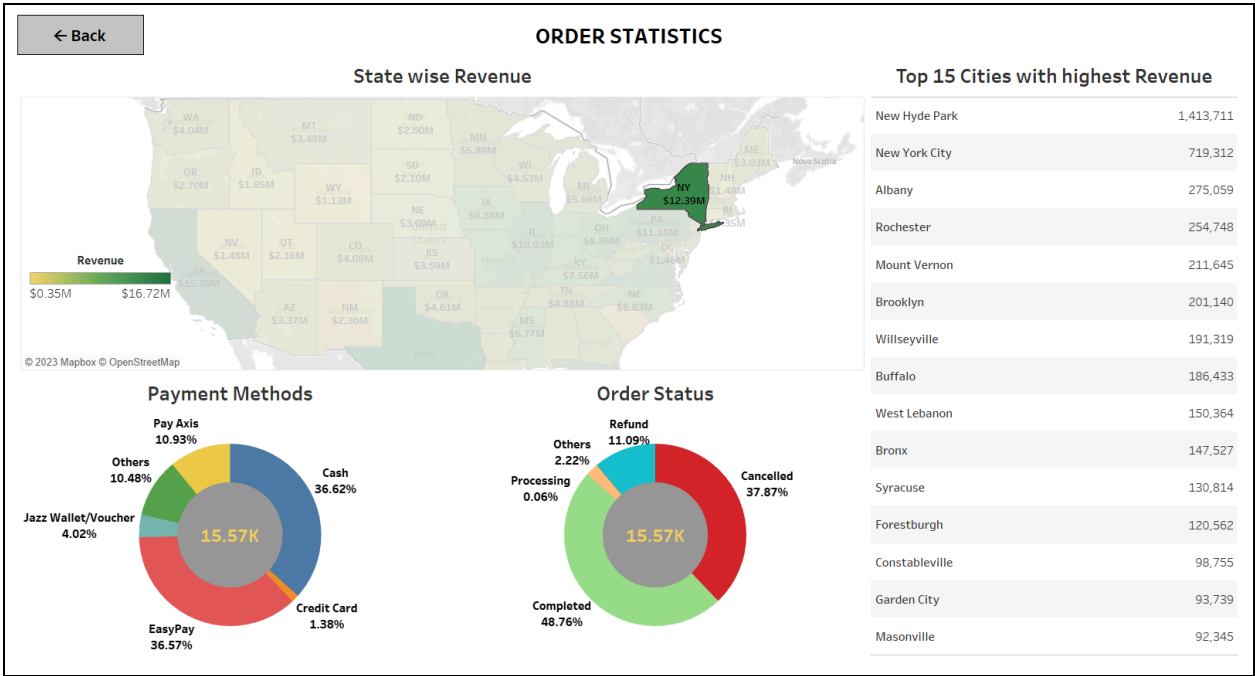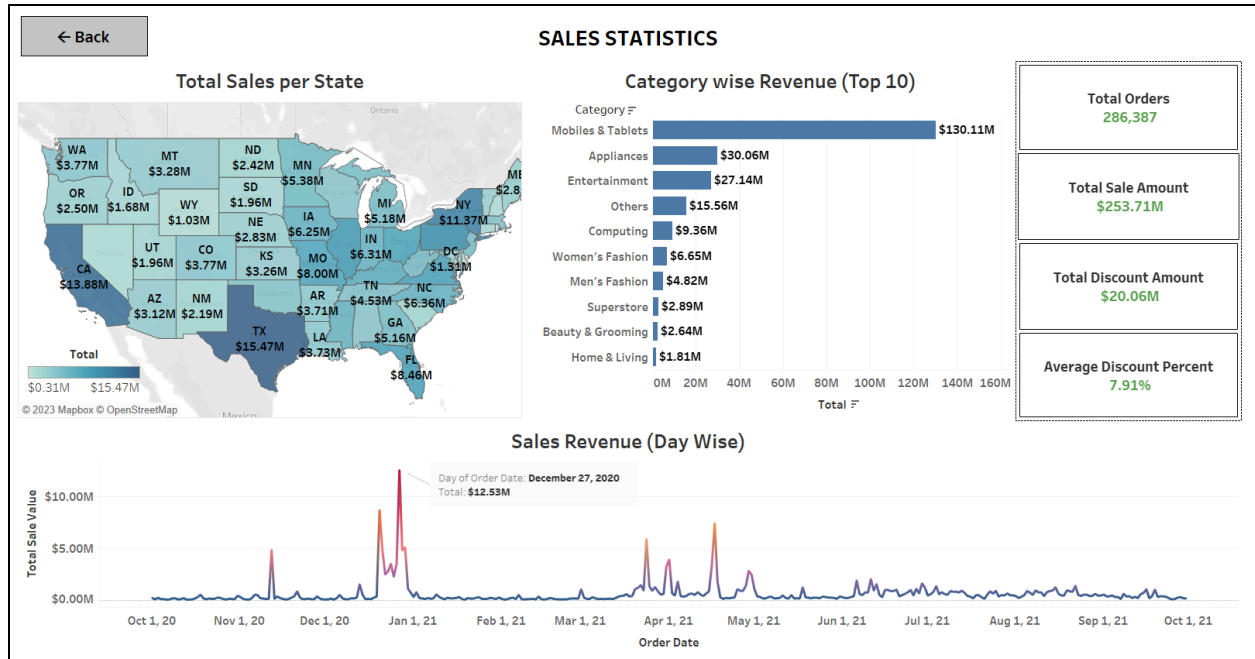
Regional Statistics Dashboard

D. Order Statistics

Order Statistics is the third dashboard that can be accessed from the main page. The dashboard's visualizations show data pertaining to order statistics, such as distribution by payment method. The 'Use as Filter' interaction on the Geomap allows you to drill down to data about distribution of payment methods, order status(done by creating groups from the corresponding fields) and top 15 cities with highest revenue from other charts. This is an example of Cognitive modeling.

    a. State wise revenue (*Geospatial Map*)

    b. Distribution of payment methods (*Donut Chart*)

    c. Distribution of Orders based on their status (*Donut Chart*)

    d. Data table with top 15 cities with most revenue (*Data Table*)

Orders Statistics Dashboard

E. Sales Statistics

This is the final dashboard and contains insights on sales. Several metrics related to sales volume, discounts, state wise, category wise metrics and other data. Below are the worksheets used here.

    a. Sales Distribution on State (Geospatial Map)

    b. Revenue based on category (Bar Graph)

   c. Daily Sales Revenue (Time Series Line Chart)

    d. KPI Metrics

Sales Statistics Dashboard

IV. Graphic Design Principles

These dashboards are designed by following several Graphic design principles resulting in pleasing and appealing visualizations.

- **Text and Typography:** The font of the text for headings, sub-heaading and axis labels was used based on the typography principles while maintaining the ratio of font size.

- **Color Theory**: The color palette used in the visualizations are curated in such a way to maintain contrast ratio for better understanding. Tableau provides various color combos that support accessibility. All the dashboards are designed this way.

- **Layout and White Space**: The dashboards were designed in such a way that there is no overloading of information that disrupts aesthetics. The purpose behind the building of visualizations may be lost if there is too much clutter. Effective usage of white space makes the dashboard clean.

- **Accessibility:** To make the dashboard accessible by everyone, all the dashboards are designed in accordance with Web Content Accessibility Guidelines (*WCAG 2.0 AA*).
- **Top Down Modeling**: The below figure represents the top down modeling approach during filtering to drill down the insights to a particular filter. This can be reversed by clicking elsewhere on the chart.
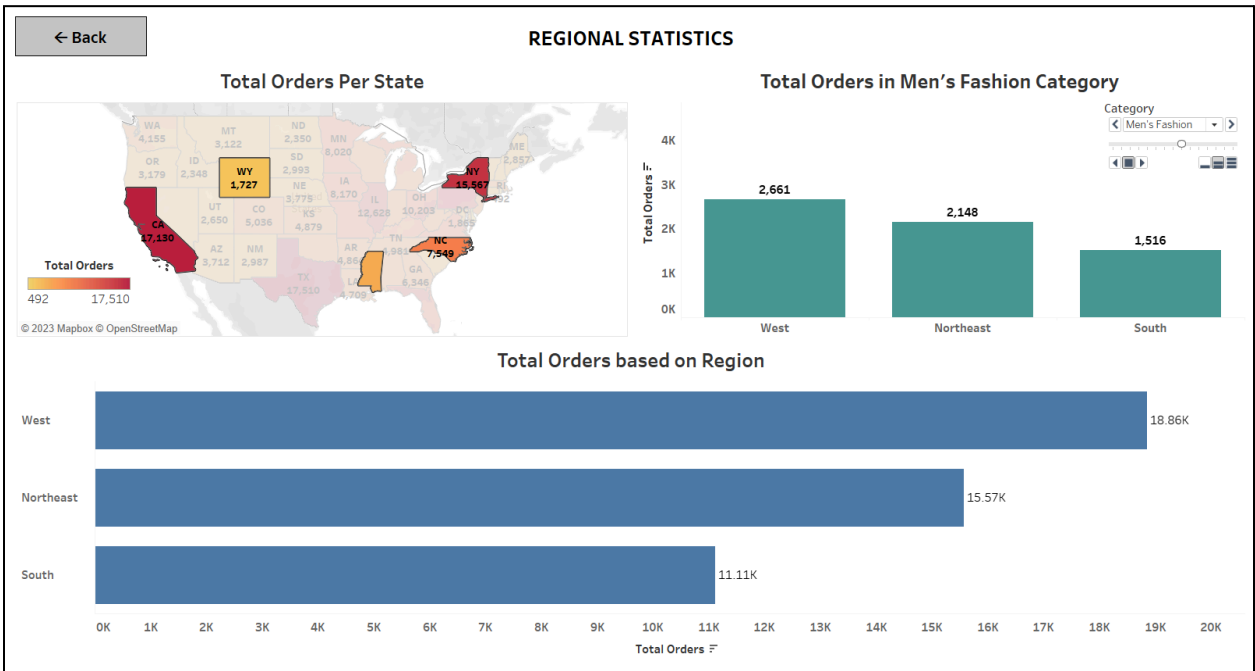
Top Down Approach - Selecting State filter and getting relevant insights for that filter

V.   Gestalt Principles

- **Proximity**: The data related to each region is grouped together separated by little white space representing Proximity.
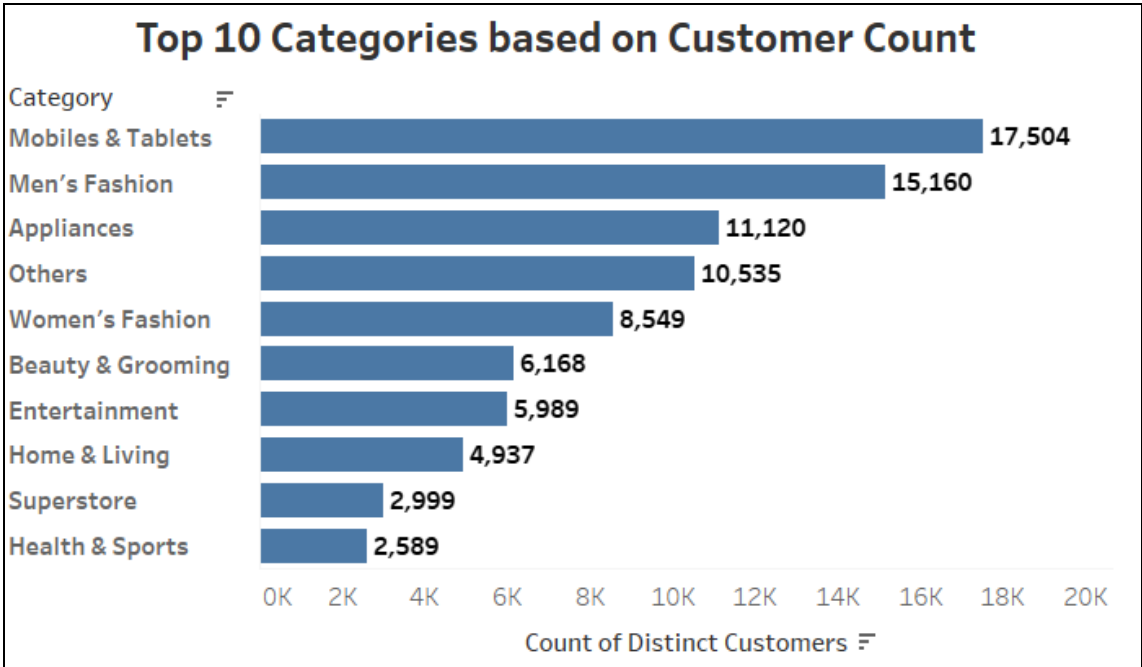
- **Closure:** This principle emphasizes on missing data in a continuous trend, where the user tries to complete the incomplete data with a simple and straightforward pattern. Below, we can see there is no missing data and the line chart is continuous.
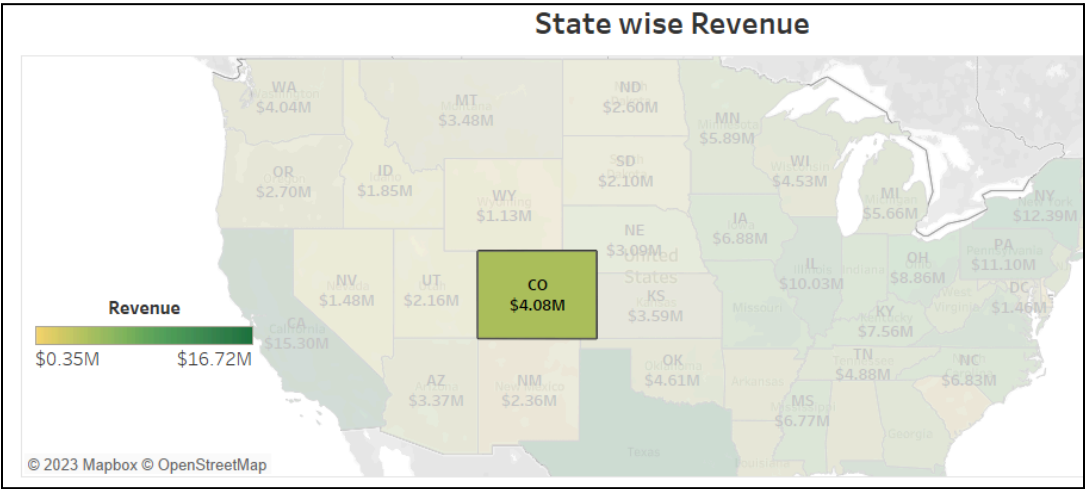

- **Continuity:** This principle demonstrates a specific order of arrangement of elements within a chart. This makes the data easier to understand.

Top 10 Categories based on Customer Count

Category	Count of Distinct Customers
Mobiles & Tablets	17,504
Men's Fashion	15,160
Appliances	11,120
Others	10,535
Women's Fashion	8,549
Beauty & Grooming	6,168
Entertainment	5,989
Home & Living	4,937
Superstore	2,999
Health & Sports	2,589

- **Figure and Ground**: This principle illustrates that the data points are oriented in a 3 dimensional space where few points are in the background while others shadow them in foreground. Below chart represents this by focussing on selected tiles.

State wise Revenue

State	Revenue
WA	$4.04M
MT	$3.48M
ND	$2.60M
MN	$5.89M
OR	$2.70M
ID	$1.85M
WY	$1.13M
SD	$2.10M
WI	$4.53M
MI	$5.66M
NY	$12.39M
NE	$3.09M
IA	$6.88M
IL	$10.03M
OH	$8.86M
PA	$11.10M
NV	$1.48M
UT	$2.16M
CO	$4.08M
KS	$3.59M
KY	$7.56M
DC	$1.46M
CA	$15.30M
AZ	$3.37M
NM	$2.36M
OK	$4.61M
TN	$4.88M
NC	$6.83M
MS	$6.77M

Revenue: $0.35M — $16.72M

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- **Focal Point**: Highlighting a particular part of the visualization to explain the importance is usually the motto of this principle. Below, we have employed an annotation to make the highest point standout with an annotation card.
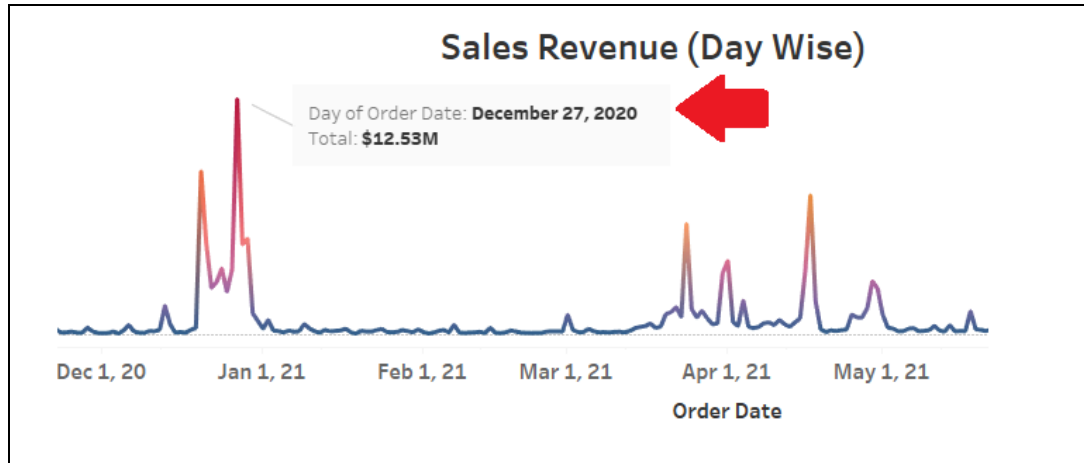
VI.   Additional Interactions

- **Tooltip/Hover**: Tableau supports data display on hover by default. Tooltip is an effective way to display data quickly without having to label them. Tooltip is enabled for all the charts in all the dashboards. We can customize the data and we have employed the tooltip feature at the navigation region of dashboards.
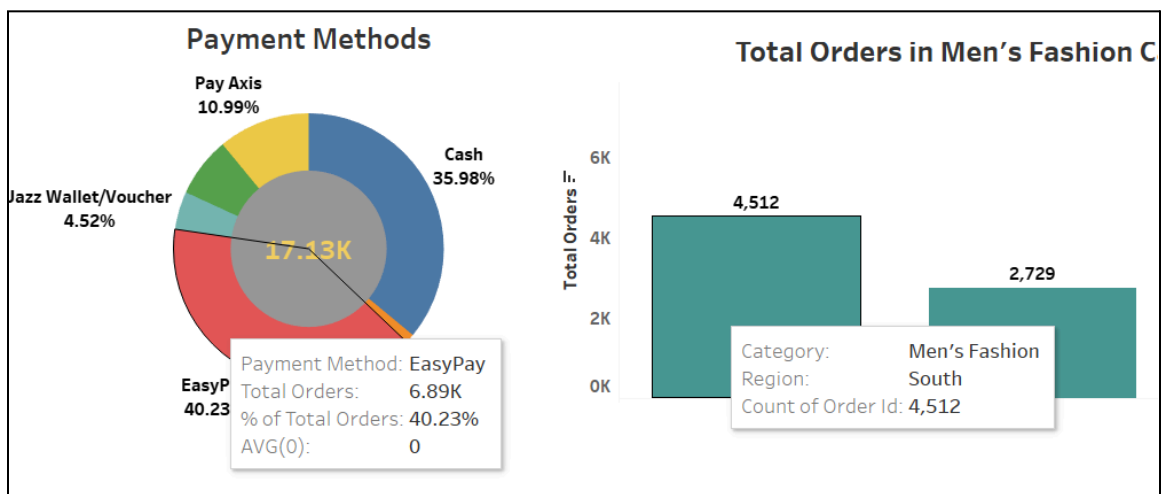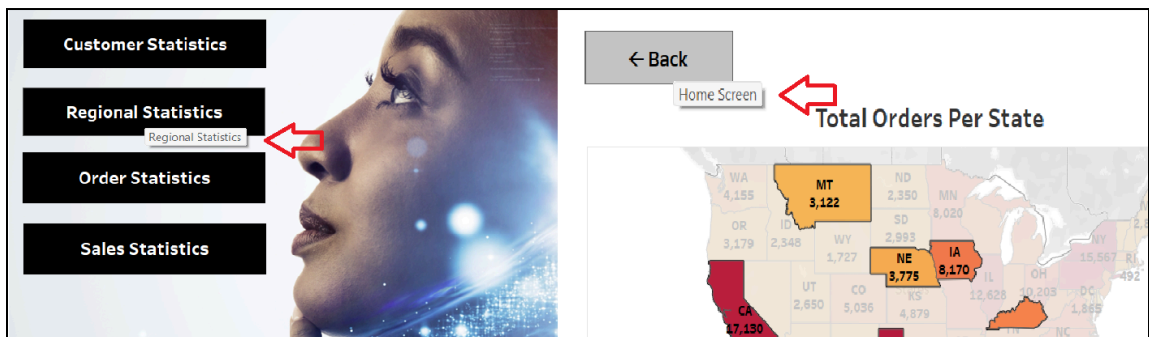
- **Zoom/Scaling:** Interactions like zooming on geographical maps and drilling down with respect to single/multiple states were applied on every dashboard.

- **Buttons**: We have employed buttons to navigate from one dashboard to another. This enables easier navigation to view stats for each of the sub-section. These buttons provision Selection controls to the user for deeper exploration.

VII.   Conclusion

Therefore, we can summarize that the dashboard was built considering design principles, Gestalt principles and accessibility in mind. Overall, there were 5 dashboards, 18 worksheets, 8 buttons, 2 groups, 5 calculated fields used in this. There were no more than 4 charts in any dashboard for aesthetic purposes. Proper heading and labeling is deployed throughout the project. Annotations were added wherever necessary to highlight key features. In Total, there are 7 different types of data charts(*including data tables*) created in the project.