At the end of this presentation, you will be able to use three fundamental metrics for Return Analysis on the Superstore data. You will be able to filter out and/or pre-determine parameters for grouping, analyzing and displaying different results, in order to obtain insights out of the data.

First, we need to establish that ”Returns” are all of those orders that were either cancelled, or returned to the company for a refund due to several possible causes.
The main component of a ”Return” lays on the premise that it signifies a cost, instead of revenue for the company.

The three fundamental metrics for calculating Return values throughout this analysis are:

Return Rate:

This metric refers to the percentage of total orders placed that are cancelled or returned to the company.
For instance, if we got 50 orders returned out of 100 total orders, then our Return Rate is 50%.

Total Cost of Returns:

This metric refers to the total value or sale price of the returned products, plus any extra costs of generated by the return process.

Our Total Cost of Returns shows us the impact that returns have on our total sales.

Total Returns:

This metric refers to the actual number of items returned to the company.

How should Returns be measured?... Which Return Measure should be used?...

Our three metrics can provide us with useful information about our data, however, our objectives will define which results fit best the type of answers we want to obtain.

Return Rates are useful when we want to get the ratio of impact or effect that returns have on a certain category, measure or event (e.g: product types, total sales or order date).

The *Total Number of Returns* is useful when we want to get a comparative in real volume or its average, or when we need the number of returns by certain categories (e.g: Number of Returns vs Total Orders, the total number of specific products returned, The total number of returns by customer, etc.)

The *Total Cost of Returns* is used to get the financial impact or effect of returns on total sales or profit.

Total Sales	$2,901,676.77
Total Cost of Returns	$784,980.19
Total Returned Items	3,226
Return Rate	0.26

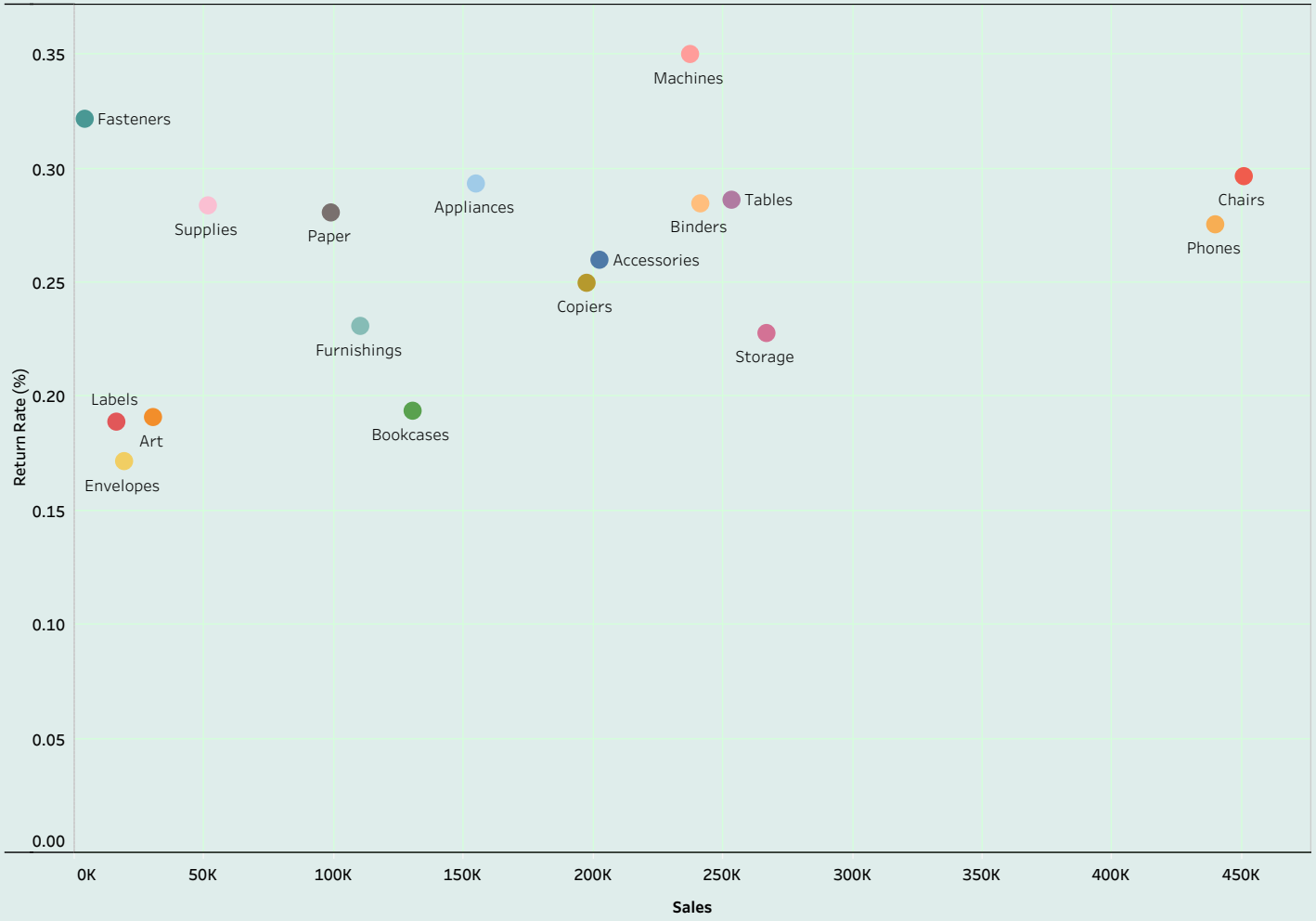
According to several online sources, the average Return Rate for E-commerce Stores is between 20-30% and 16.5% for the Average Retail Store.

Sources:

-https://capitaloneshopping.com/research/average-retail-return-rate/
-https://www.invespcro.com/blog/ecommerce-product-return-rate-statistics/
..

State	Return Rate	Total Cost of Returns	Total Returned Items
California	0.45	278,825	1,370
Colorado	0.36	22,273	89
Massachusetts	0.34	16,381	62
Mississippi	0.34	518	25
New Hampshire	0.27	2,174	9
New York	0.28	176,208	408
Oregon	0.45	6,784	84
Tennessee	0.38	27,020	101
Utah	0.57	14,099	54
Washington	0.34	71,333	222

California has the highest Total Cost of Returns and the highest Number of Returned Items.



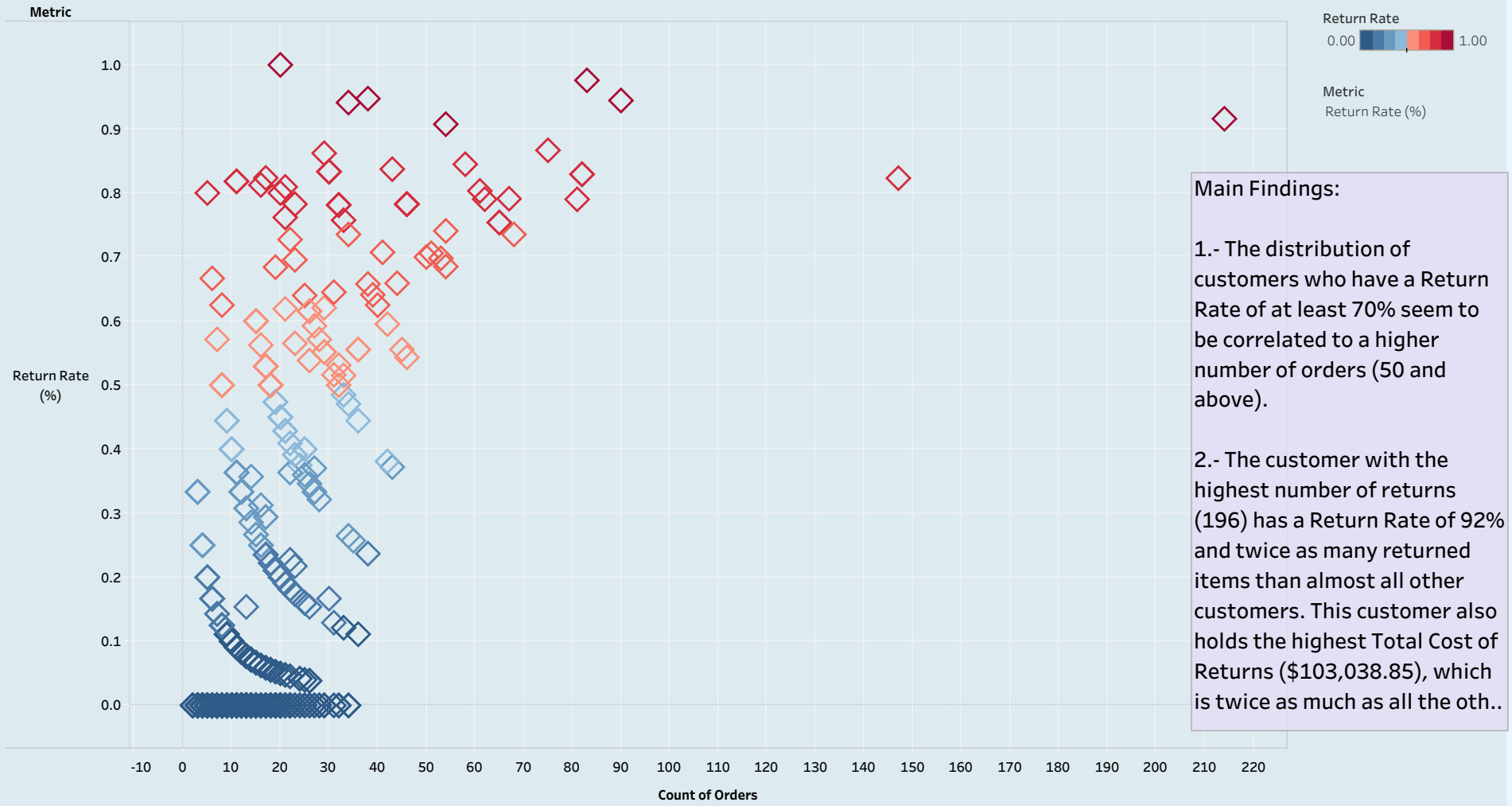
Metric
Return Rate (%)

Main Findings:

1.- Machines, Fasteners and Chairs have the highest Return Rates (30% and above).

2.- Binders and Paper hold the highest number of returned items (above 450 each).

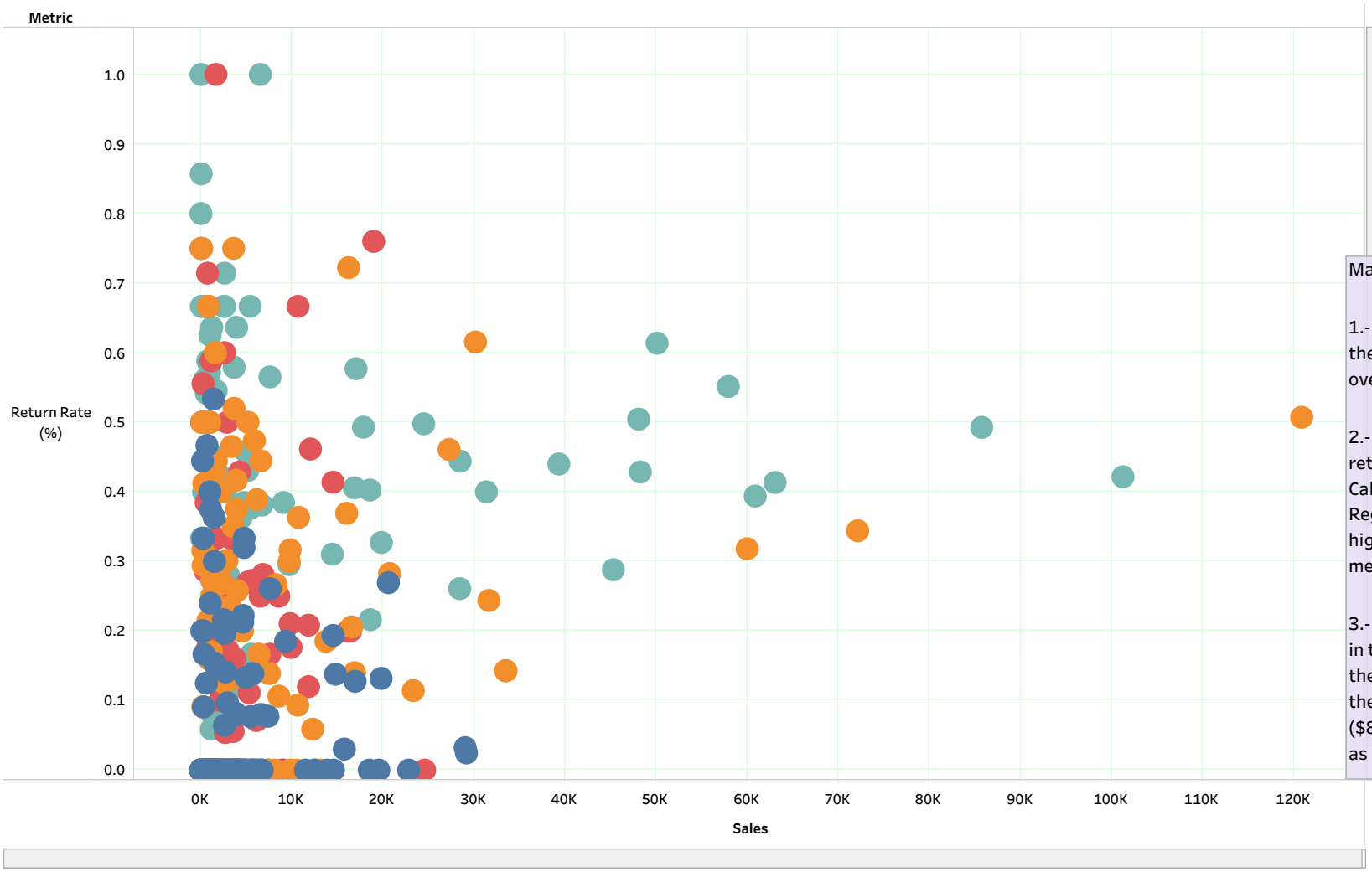
3.- Chairs and Phones have the highest Costs of Returns (above 130k each).



Main Findings:

1.- The distribution of customers who have a Return Rate of at least 70% seem to be correlated to a higher number of orders (50 and above).

2.- The customer with the highest number of returns (196) has a Return Rate of 92% and twice as many returned items than almost all other customers. This customer also holds the highest Total Cost of Returns ($103,038.85), which is twice as much as all the oth..



Main Findings:

1.- The Central Region has the lowest Return Rates overall.

2.- With above 120 items returned each, the State of California from the West Region holds the three highest values for this measure.

3.- The Sub-Category Chairs in the State of New York in the East Region, registers the highest Cost of Returns ($80,315.06) which is twice as much as the rest of the ..

Return Rate (%)

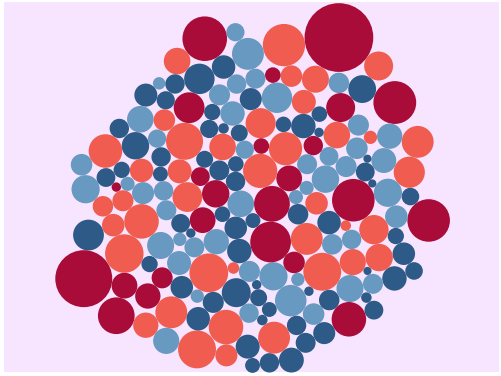
Main Findings:
1.- The Sub-Category Machines from the Technology Category, holds the highest Return Rates (35%) and The State of California contains the highest Return Rates by State.
2.- Binders Holds the highest number of Items Returned. ..

These visualizations show 3 Return Metrics by different variables; for instance, the Return Rate:

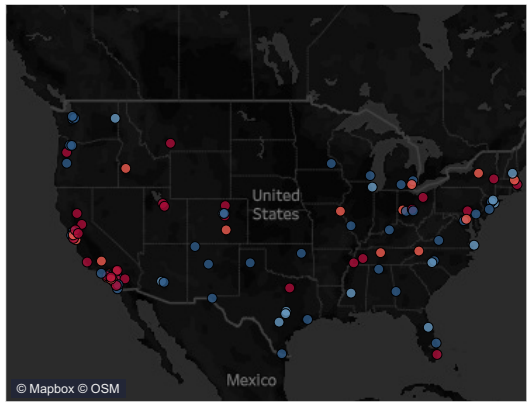
-Return Rate (%) by Category (Below).
-Return Rate (%) by State & City (Bottom Left): Hover over a City to see Return Rate (%) by Sub-Category for an individual State.
-Return Rate (%) by Customer & Number of orders (Top Center).
-Correlation Between Total Sales by Sub-Category and Return Rate (%) (Bottom Center).
-Return Rate (%) by Sub-Category (Next to the last one).

On the Top Right you will find interactive filters. Use the Metric dropdown to change what's being measured (Return Rate (%), Total Returns (Sum) or Total Cost of Returns ($)). The Category and Sub-Category dropdowns provide the ability to filter by one or several of their items, and so does the Packed Bubbles Total Orders Slide filter. Finally, both the Map and Packed Bubbles Metrics show the color segmentation by each data value.

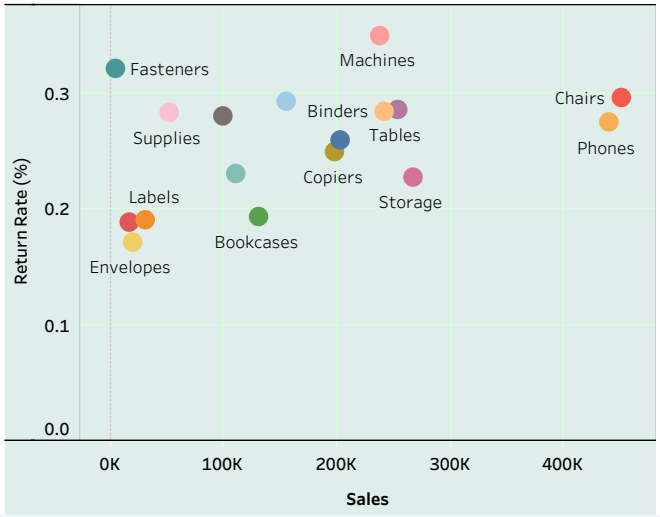
Return Rate (%) by Customer & Number of Orders



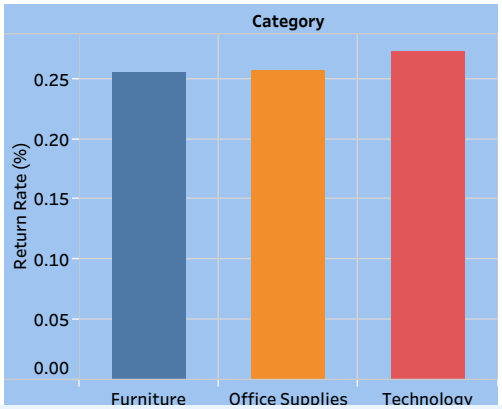
Return Rate (%) by State & City



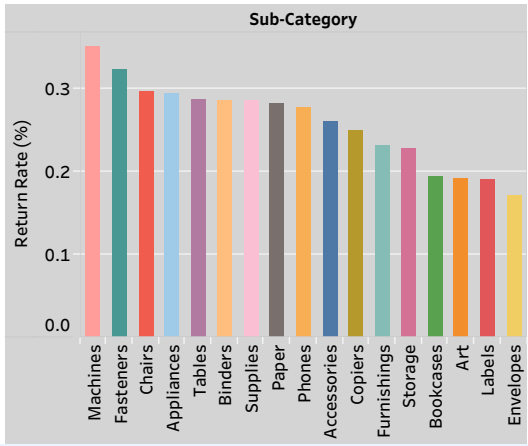
Correlation Between Total Sales by Sub-Category & Return Rate (%)



Return Rate (%) by Product Category



Return Rate (%) by Sub-Category



Metric
Return Rate (%)

Category
All

Map Metric
0.2000 1.0000

Packed Bubbles Metric
0.2000 1.0000

Packed Bubbles Total .
2 to 734

Sub-Category
All

Total Returns (Sum)

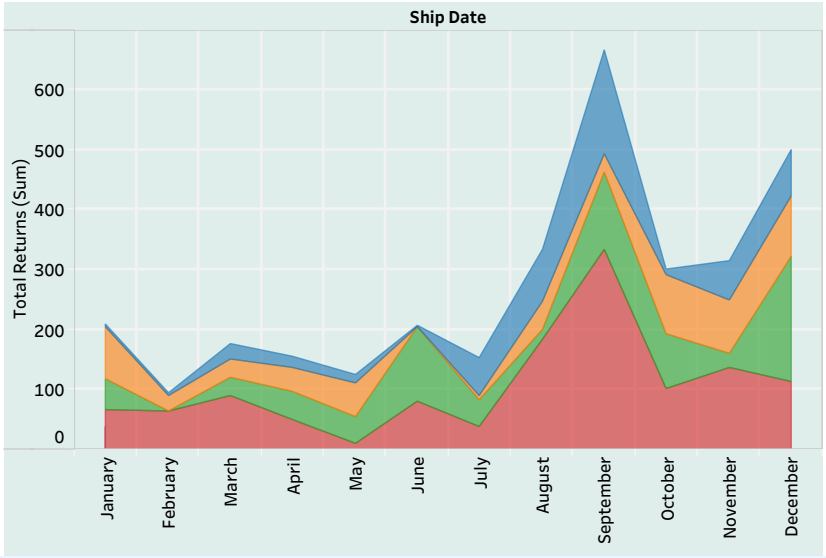
Main Findings:
1.- January has the highest Return Rates every year from 2019 to 2021.
2.-Sunday has the highest Number of Orders, Number of Orders Returned, Total Costs of Returns and Return Rate.
3.- September has The highest Number of Returns and the highest Cost of Returns every year from 2018 to 2021.

These visualizations show 3 Return Metrics by different variables; for instance, the Return Rate:

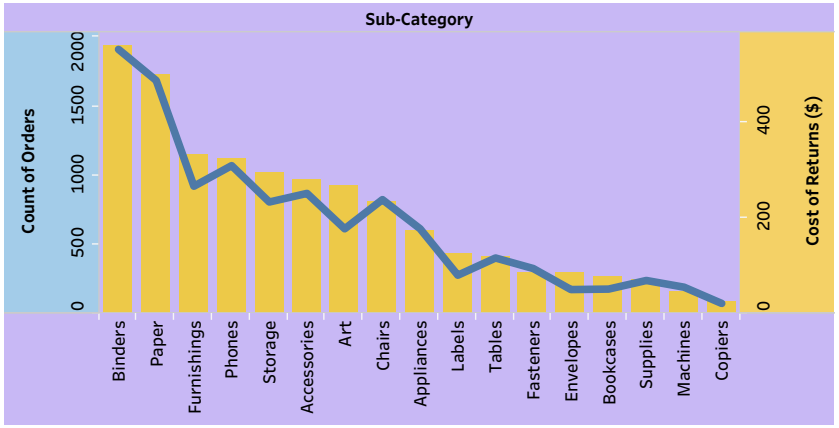
-Return Rate (%) by Month & Year (Below): Hover over a color area to see Return Rate (%) by Category for that year and month.
-Return Rate (%) & Count of orders by Sub-Category (Next to this one).
-Return Rate (%) & Count of orders by Weekday (Under the last one): Hover over a bar or line intersection to see the Return Rate (%) by Order & Ship Dates Days Difference on that weekday.

On the Right you will find interactive filters. Use the Metric dropdown to change what's being measured (Return Rate (%), Total Returns (Sum) or Total Cost of Returns ($)). The Ship Date (Month and Year), Region and Ship Mode dropdowns provide the ability to filter by one or several of their items, and so does the Total Orders Slide filter. Finally, both the Area Chart Ship Date (Year) and Composite Charts Measure Names Metrics show the color segmentation by each data value.

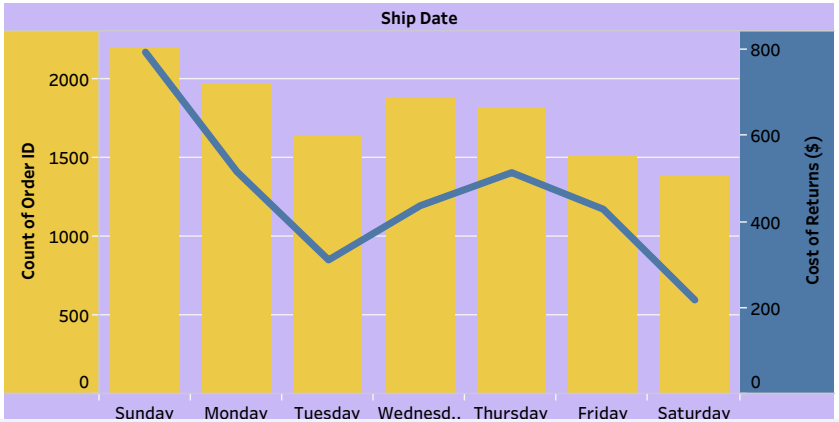
Total Returns (Sum) by Month & Year



Total Returns (Sum) & Count of Orders by Sub-Category



Total Returns (Sum) & Count of Orders by Weekday



Metric
Total Returns (Sum)

Area Chart Ship Date (Yea..
2018
2019
2020
2021
2022

Ship Date (Month)
All

Total Orders
2 to 734

Ship Date (Year)
All

Region
All

Ship Mode
All

Composite Charts Measur..
Metric
Total Orders

Order & Ship Dates Days Difference Dashboard Analysis

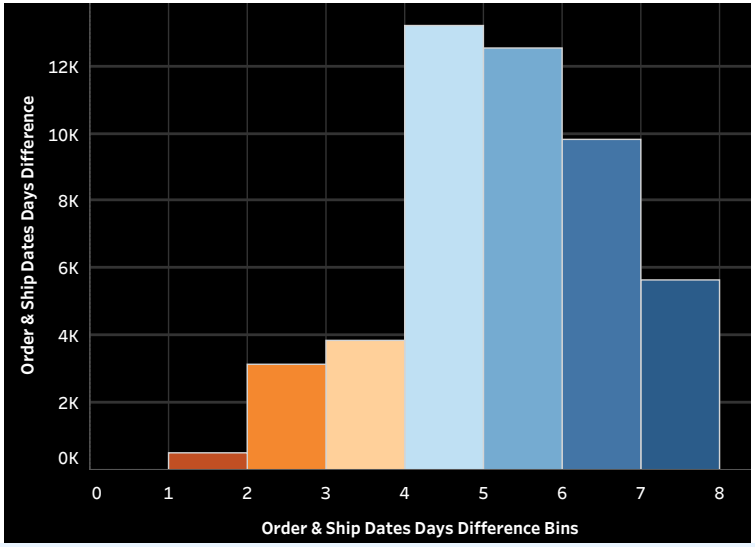
These visualizations show the difference in days between Order Dates and Ship Dates for every order in the dataset. Extra information can be consulted when you hover over one section in the three histograms, such as: Count of Orders, Count of Returns, Return Rate, Total Cost Of Returns, Order & Ship Date Days Difference, Product Name, Category and Region.

Here is a description of each histogram:

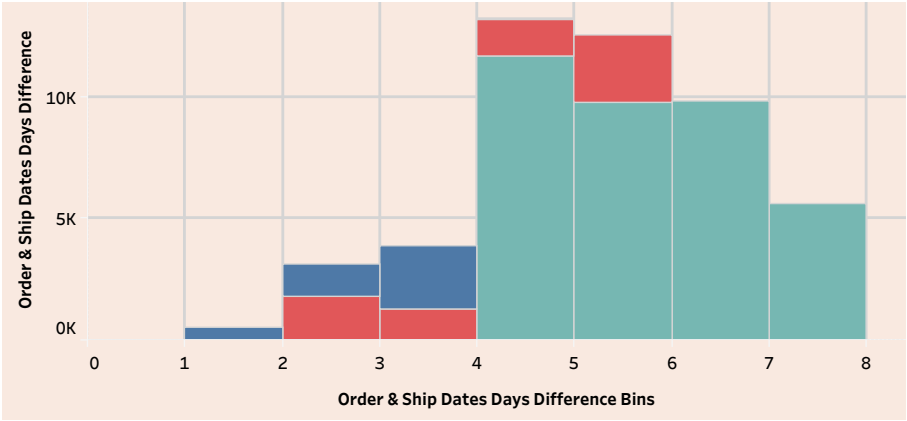
-This histogram shows the distribution of days past between and order date and its ship date (Below).
-This histogram shows the distribution of days past between and order date and its ship date but it is segmented by Ship Mode (Next to this one).
-This histogram shows the distribution of days past between and order date and its ship date but it is segmented by Product, Category and Region (Under last one).

On the Top Right you will find interactive filters. The Ship Mode, Category and Region dropdowns provide the ability to filter by one or several of their items. The Region, Ship Mode legends show the color picked for a certain category and the Order & Ship Dates Days Difference legend displays the da..

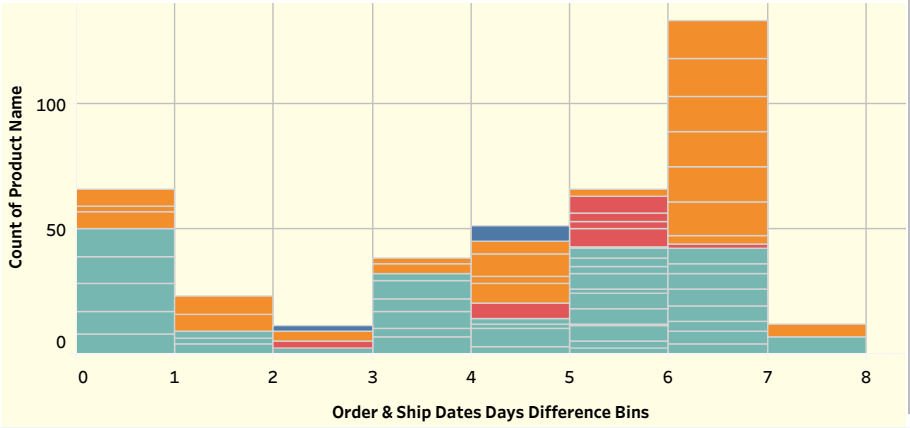
Order & Ship Dates Days Difference



Order & Ship Dates Days Difference by Ship Mode



Order & Ship Dates Days Difference By Product, Category & Region



Ship Mode
All

Ship Mode
- First Class
- Same Day
- Second Class
- Standard Class

Region
- Central
- East
- South
- West

Region
All

Category
All

Main Findings:

The 7 day difference between Order Dates and Ship Dates bin has the second highest Return Rate and the highest Number of Returns. As we break it down, there are 6 items in it with a 100% Return Rate and the highest Number of Returned Items.

Conclusions and Recommendations

It is recommended to look further into the reasons Machines, Fasteners, Phones and Chairs were returned, as they have the highest Return Rates (30% and above) and highest Cost of Returns (above 130k each). An improvement in delivery, quality check or shipping speed could definitely lower these metrics and therefore increase profits.

It is recommended to look further into the reasons the customer "Seth Vernon" returned 196 items (92% Return Rate) with a Total Cost of Returns of $103,038.85, as this value not only is an outlier that might be affecting the company's overall performance, but it also comprehends 13% of the Total Cost of Returns ($784,980.19).

The company should focus on the 7 day difference between Order Dates and Ship Dates bin, since this period of delivery might be linked to a root cause of cancelled or returned orders. We must remember that this day difference has the second highest Return Rate and the highest Number of Returns. besides, there are 6 items in it with a 100% Return Rate and t..

Seasonality is definitely a factor that increases Total Sales, but also Return Metrics Values in September.

It is recommended to look for specific Return reasons in order to optimize the processess involved in the delivery of the company's products, with the purpose of decreasing these metrics and increase profit.

It would be a good idea to have a closer look at the details for returns in 2021, as this is the year with the highest Return Metrics values.

It is recommended to look further into the reasons for the returned orders in California, since it has the second highest Return Rate by State with 45% and only under Utah. Nevertheless, its Number of Returned Items is the highest (3 times bigger than the second highest) and so it is its Total Cost of Returns, which is 63% bigger then the second highest.

Should the root causes be found and processess optimized, profits would increase considerably.