Better Understand the World’s Purchasing Trends through Visualisation Tools.

Executive Summary

This report seeks better understand the world's purchasing trends through visualisation tools. Another aspect we would like to understand and examine if there are trends in consumer shopping and differences in shopping patterns within the United States. These aims are broken down into the following research objectives:

1. States have the largest and smallest revenue and profit ratios.
2. Profit, profit ratios and revenue of different categories of products.
3. Trends of quantity of products sold through the years.
4. Shipping methods and shipping times.
5. Do different regions have different trends and preferences when purchasing products.

The dataset provided will be broken down into five separate dashboards filled with clear visualisation tools and techniques with images taken from those dashboards added into this report to help readers easily understand the large amount of data with key values being highlighted and shown.

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1. World Data

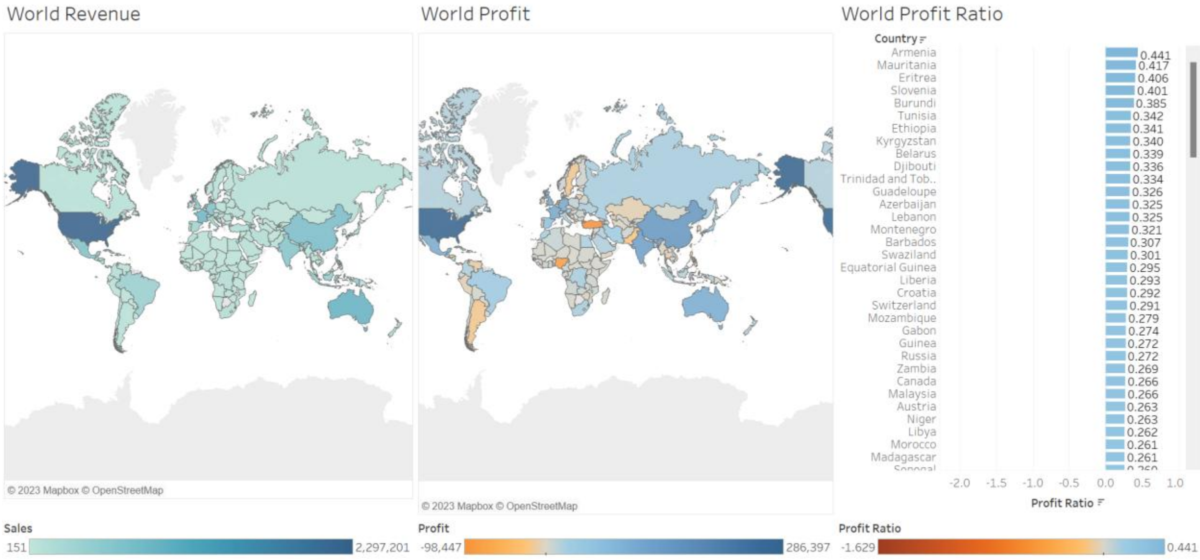

Figure 1

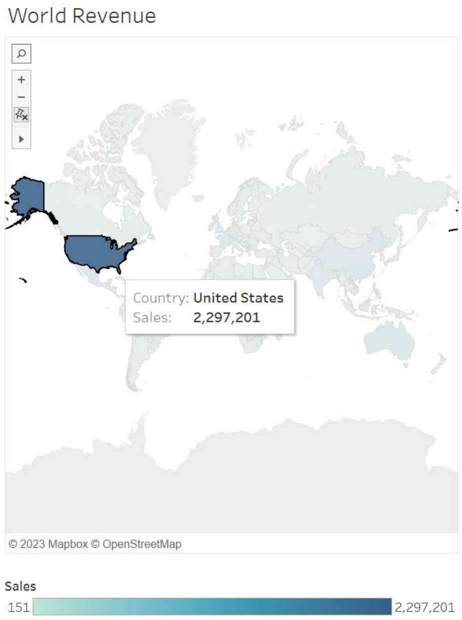

Figure 2

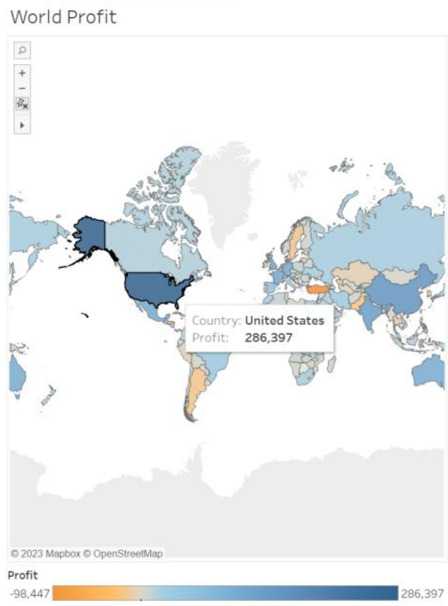

Figure 3

Figure 4

Figure 5

Figure 1 above shows an overview of the total sales revenue, profit and profit ratio of the world in the form of a world map and bar chart. In figure 2 and 3, we can clearly see that the United States is the biggest single market in terms of both profit and revenue, however when we investigate the profit ratio of all the countries, Armenia takes the highest spot with a profit ratio of 0.441 while the United States only has a profit ratio of 0.125. However, profit ratio alone is not an accurate judge of whether a country is a sustainable market as the quantity of sales and profit in Armenia is very small. Therefore, for this report, we will be focusing on the United States.

2. State Data

2.1 Revenue and Profit of California

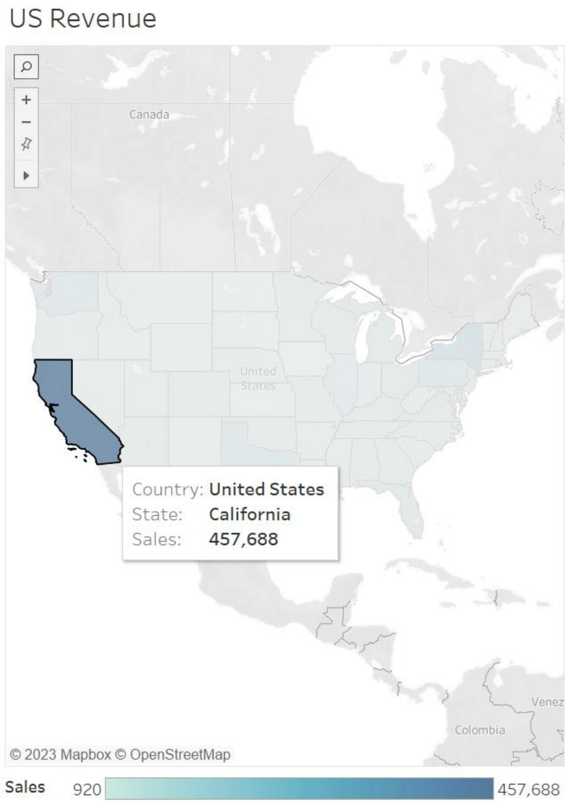

Figure 6

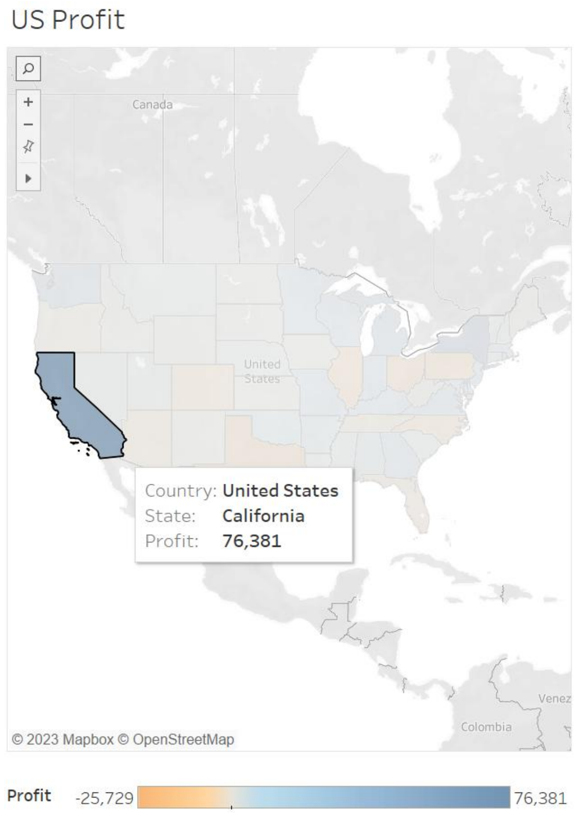

Figure 7

In viewing both Figure 6 & 7, we can see that the state of California ranks the highest in both revenue and profit. However, when we review the profit ratios for all the states, California isn't the highest.

2.2 Profit Ratio of all US States

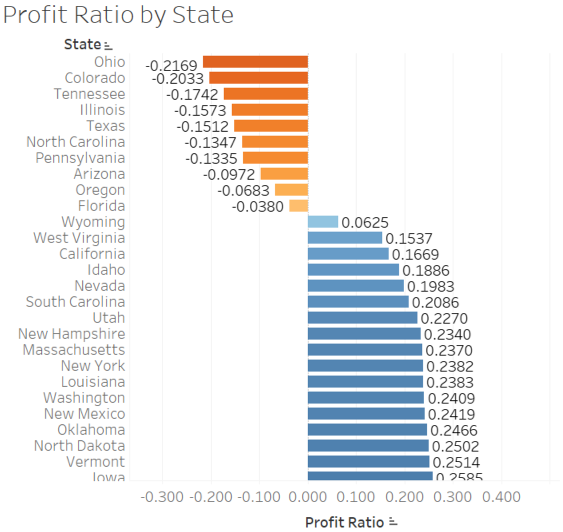

Figure 8

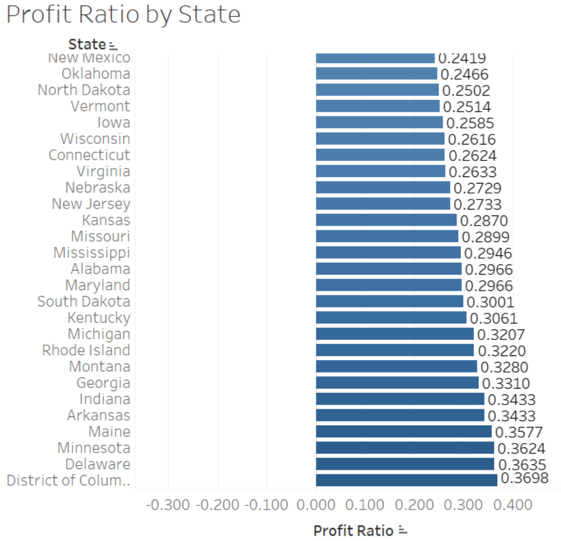

Figure 9

By comparing profit ratio, Ohio has the lowest profit ratio out for all 50 states at -0.2169 with a total revenue of only $78,258 and a loss in profit of $16,971. On the other hand, DC (District of Columbia) has the highest profit ratio at 0.3698, however it only has a revenue of $2865 and total profit of $1060. Therefore, as with Armenia's data above, we should not only use profit ratio as an indicator of the health and strength of a market as profit and revenue ratios can easily be skewed if the values are smaller but use it in conjunction with profit and revenue for a more accurate interpretation.

3 Yearly Sales and Profits

3.1Profit and Profit Ratio

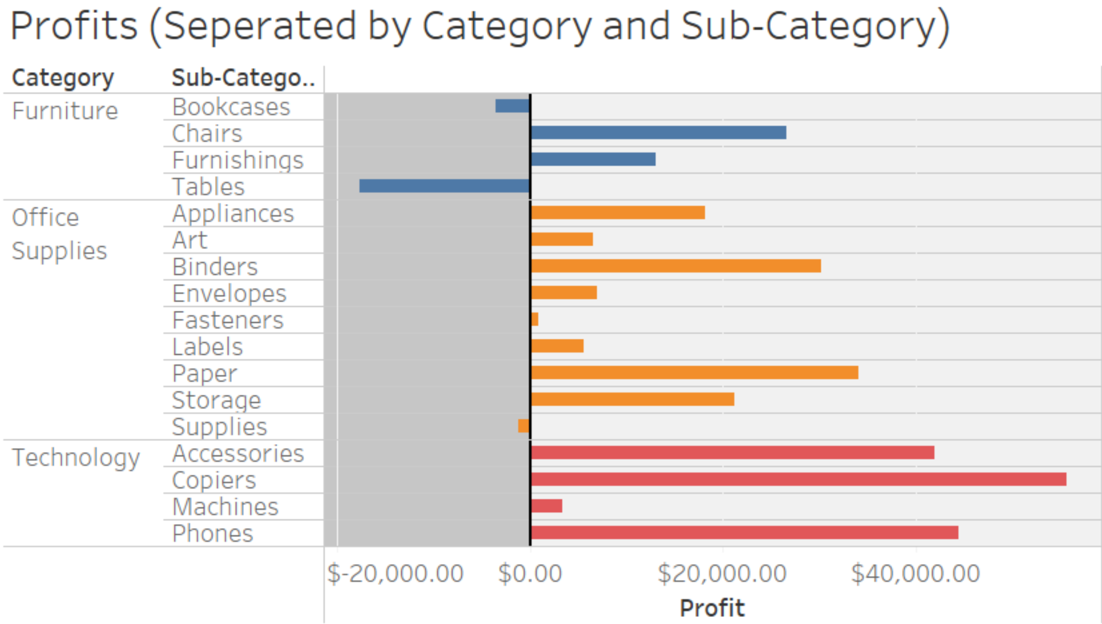

Figure 10

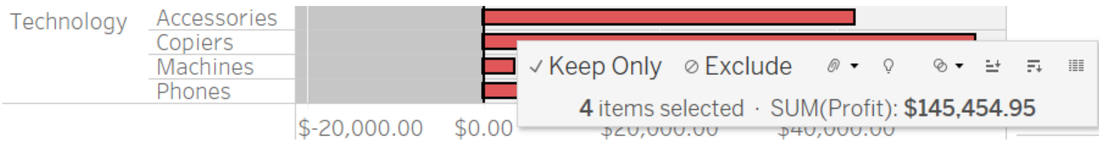

Figure 11

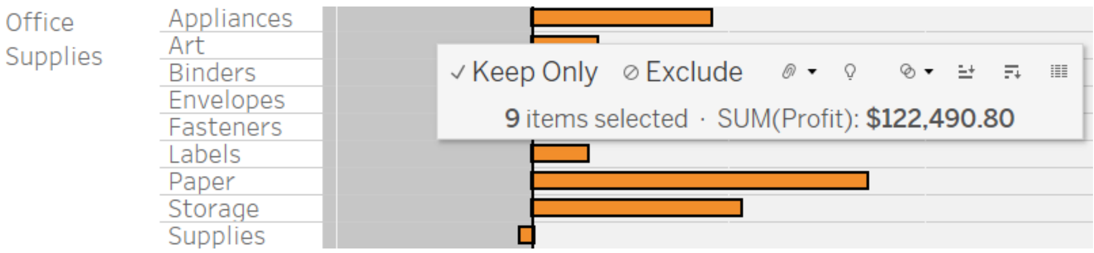

Figure 12

Viewing the combined data in Figure 10, we can see that office supply and technology are the most profitable products to sell with technology bringing $145,454.95 and office supplies bringing in $122,490.80 of profit.

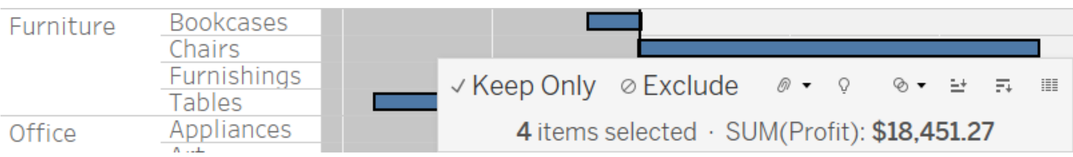

Figure 13

Total furniture profit across the 4 years was at $18,451.27, with a profit ratio of only 0.107. This is a little over a tenth of the profits of both office supplies and technology's profits with table sales being a major factor, making a loss of $17,725.48 throughout the 4 years.

3.2 Quarterly Revenue and Profits

Sales Quantity Per Quarter by Category and Sub-Category

		Year of Order Date / Order Date															
		2018				2019				2020				2021			
Category	Sub-Catego..	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Furniture	Bookcases	33	21	37	62	36	32	89	85	31	29	69	68	25	112	46	93
	Chairs	75	90	136	239	71	101	133	223	73	134	155	252	67	140	199	268
	Furnishings	79	112	192	277	95	191	188	291	177	217	251	396	124	227	300	446
	Tables	37	77	64	92	39	24	69	103	50	74	85	137	55	49	83	203
Office Supplies	Appliances	25	66	107	116	48	105	68	144	46	88	120	142	113	125	176	240
	Art	122	192	142	157	65	132	175	236	61	166	205	241	162	254	286	404
	Binders	166	246	328	349	107	243	392	435	217	335	465	614	338	432	520	787
	Envelopes	23	35	54	94	34	27	60	116	47	50	54	71	40	49	68	84
	Fasteners	26	48	72	55	25	36	43	70	33	42	86	129	52	33	61	103
	Labels	45	53	90	138	38	71	61	93	30	92	133	108	44	107	153	144
	Paper	143	166	312	396	171	217	259	440	146	376	418	427	231	346	503	627
	Storage	88	118	184	283	70	111	249	223	106	207	201	292	155	194	288	389
	Supplies	4	24	44	58	12	17	41	37	14	60	69	75	29	50	60	53
Technology	Accessories	67	85	205	223	68	103	185	279	94	138	165	285	146	218	316	399
	Copiers		10	8	11	9	20	11	23	4	9	32	24	20	11	17	25
	Machines	16	12	45	23	12	20	22	40	21	43	20	45	13	24	25	59
	Phones	79	168	139	298	79	165	196	257	131	174	249	261	195	203	296	399

Figure 14

By viewing the quarterly sales quantity in Figure 14, there seem to be a trend that for most products, the number of products sold throughout the year increases through the four quarters with Q1 having the lowest number of products sold and Q4 having the highest.

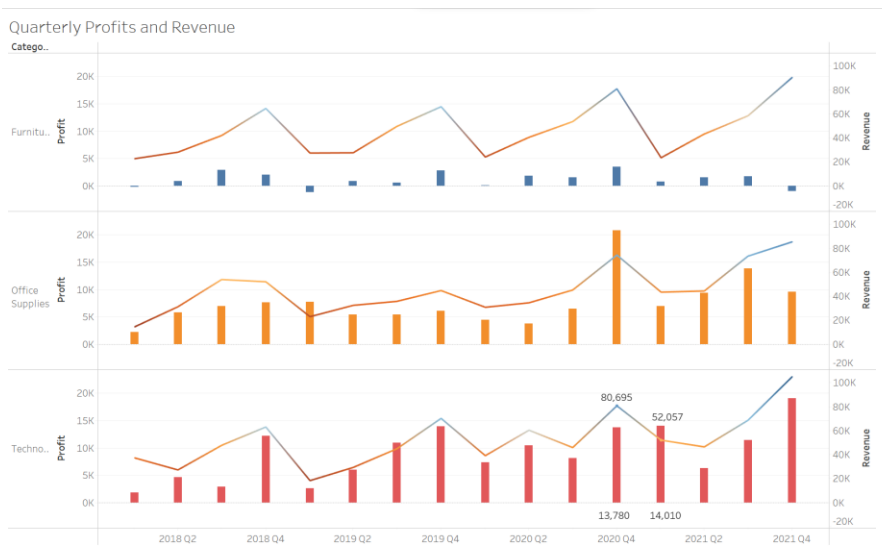

Figure 15

This can be seen more clearly in the "Quarterly Profit and Sales" graph in Figure 15. The line represents the revenue and there is an obvious trend through the years, starting low at the first quarter and slowly rising before it peaks in the fourth quarter of the year and dipping back down. This is useful data as it enables sellers to anticipate the amount of products they should have in stock throughout the year in order to effectively use their storage space and to not have an oversupply on stagnant items that are not bringing revenue and preventing sellers from storing products that are.

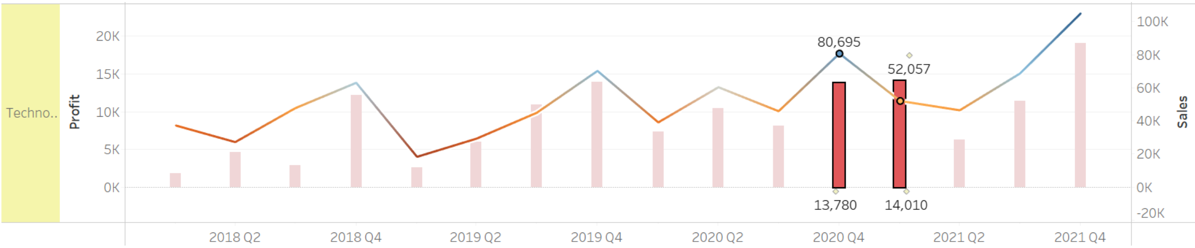

Figure 16

However, the bar graph, which represents profit, tell a different story. There are instances where revenue and profit don't correlate. For example, in Figure 16, between the fourth quarter of 2020 and first quarter of 2021 in the technology sector, there was a drop in revenue of $28,638 but there was an increase in profit of $230 in the first quarter of 2021, this could be because the items bought during that period have a higher profit margin as compared to the previous quarter, resulting in higher profits despite having lower revenue.

4 Shipping

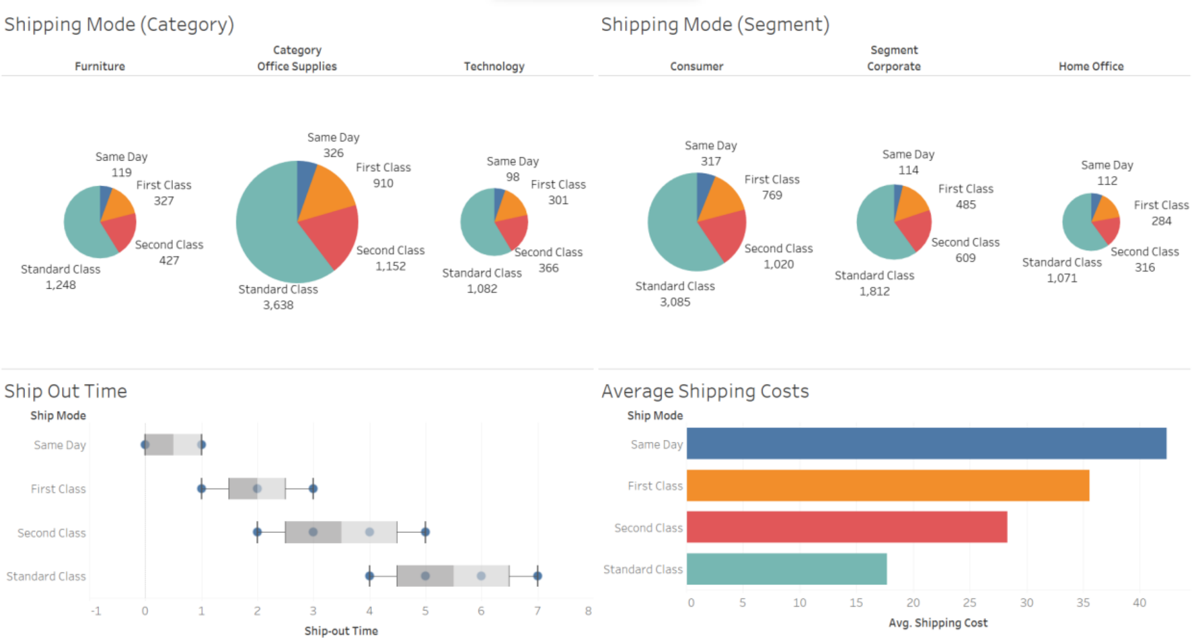

Figure 17

Standard class shipping is the most common shipping choice chosen throughout every category and segment, followed by Second class, First class, and lastly by Same day shipping. This is likely due to the difference in the cost of shipping between the different shipping methods available. Buyers are likely to choose the cheapest followed by the more expensive shipping methods, making standard class shipping method the most popular option and same day shipping the least popular method, reserved for buyers who urgently need the product and are willing to pay a premium.

Goods shipped out using standard class shipping are packed and shipped in 5 days on average with the Consumers segment making up most of the count. Management could consider adding in an additional free shipping option to entice potential new buyers that are unwilling to pay for the cost of standard class shipping. However it has to be balanced in a way that ensures that the sellers don't lose the profits from the shipping charges. An example would be to have a longer delivery time for customers using free shipping. Patient buyers can enjoy free shipping and buyers who like immediate satisfaction have the option to pay for a faster delivery time.

5 Region Data

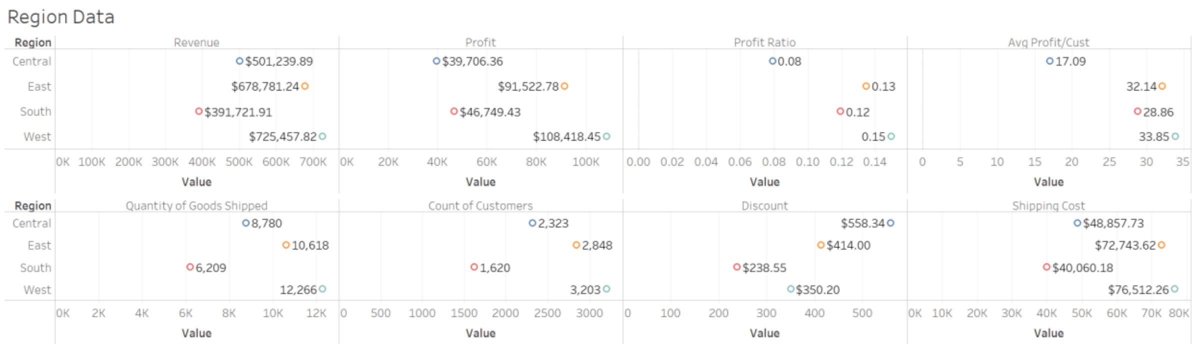

Figure 18

When comparing number of customers and number of sales in each region, the west has the highest, following the east, central, and the south. However, when we focus on profit, profit ratio, and the average profit-per-customer, the South has a higher count in those 3 aspects as compared to the Central region despite having a lower customer count, lower number of goods sold, and revenue. Interestingly, the central region is also the region that has been issued the highest sum of discounts. This could be correlated to the lower profits as customers in the Central region may be more likely to make purchases only when they are able to get the items at a discounted prices and are unwilling to pay the full price causing the profits to be lower as compared to the South whose total sum of discounts issued has been the lowest.

5.1Products Sorted by Category

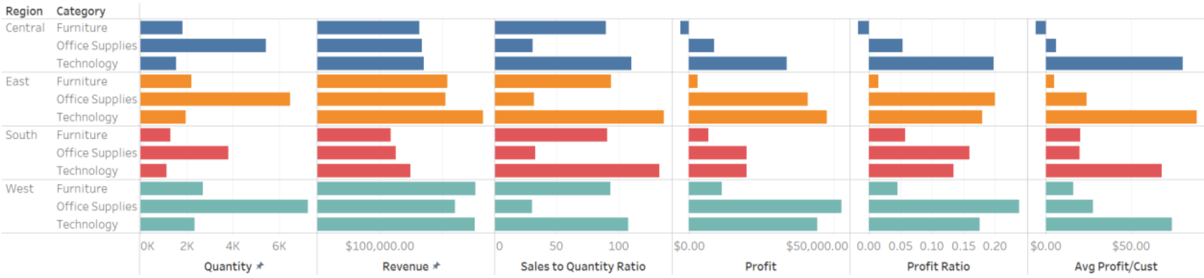

Figure 19

When viewing Figure 20, it shows clearly why the central region has the lowest profit, profit ratio, and average profit-per-customer despite having a higher sales volume than the south. Where the central region is strong in the profits in the technology sector of the market, it performs very poorly in the office supply and furniture sector. It ranks the lowest in all 3 profit aspects among the four regions and even has negative profits in terms of furniture sales.

When comparing all four regions, despite beating furniture and technology in terms of quantity of sales by a big margin, office supplies generally lose out in sales volume, overall profit and average profit-per-customer. Office supplies having the lowest sales to quantity ratio also supports this statement. It shows that for office supplies to be profitable, its products must be sold at a large scale in order to generate the revenue and profit numbers to compete with the technology and furniture sector. This is because numerous items in the office supply category are inferior items that are cheap to manufacture and sell to the public, such as paper, fasteners, and labels.

Moving on to the technology sector, it performs very well in terms of revenue and average profit-per-customer, coming in highest in those two categories, despite consistently having sold lower quantities as compared to furniture and office supplies, this is also reflected when we view the sales to quantity ratio. It also comes in as the highest in terms of bringing in profit, only losing out to office supplies in the western region. However, technology loses out in terms of profit ratio in all regions excluding the central region. This could be because the cost of producing technological products is higher than the cost of producing office supplies, this therefore reduces the profit margin and therefore produces a lower profit ratio as compared to office supplies which could be cheaply made in large quantities. Technology producing companies should consider investing in a way to reduce their production cost in order to generate higher profits and profit ratios for the future.