**Coursework**

**Business analytics, applied modeling and prediction**

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Table of contents:

* An overview of US profit statistic by state
* The investigation of Shipping Costs and Shipping Time in top 10 most profitable states
* The investigation of Shipping Costs and Shipping Time in top 10 least profitable states
* The investigation of change in profit, sales, and number of orders in 5 most and least profitable states
* The investigation of average discount in each category by state

Summary:

An investigation of US as the most profitable country. The analysis starts by finding the profit for each state and creating a visualization. The second step is to identify the top and bottom 10 states by profit, this creates the base for other dashboards. The next step was to analyze shipping costs for all categories by segment. I found the average shipping time and quantity for each state and identified the preffered shipping mode for every state. This allowed me to gain some insights to investigate how and why the profit changed in the period from 2017 to 2020. I constructed a dashboard where I investigated how the sum of sales and the quantity of sold products affected the profit for the 5 most profitable and unprofitable states. My approach was to go through each year and category in detail and compare them. From this I investigated how average discount is distributed in the states mentioned before and how discount affects the profit different categories of products in each state. This allowed me to draw my final conclusions.

The Story of my Tableau course project is an analysis of the United States. I created 5 dashboards that will help identify key insights from the given dataset. Mainly I focused on analyzing the least profitable and most profitable States. In the first dashboard, I created a profit map that shows the profit by state. We can see that the most profitable state is California and the least profitable is Texas. Further, I started digging deeper and filtered the top and bottom 10 States by profit and category. By sorting the category variable, I found out that technology is the most profitable category and furniture is the least profitable category. This created the base for further analysis.

Shipping Cost and Shipping Time in the 10 most profitable States. In this dashboard to further analyze the most profitable States, I created a table to view the average shipping cost of each category by segment. The technology category has the highest shipping fees. The maximum values are in the technology and furniture categories in the corporate segment. We can observe that office supplies have the smallest shipping fees across all segments. A bar chart of the top 10 most profitable states shows the average shipping time for each shipping mode. Here we can see that First-Class average shipping is two days, the Second Class average shipping time is approximately three days, Standard Class shipping time is approximately five days and Same Day shipping takes less than a day. Here we can also see that most of the products are shipped by Standard Class and the least by Same Day shipping. We can also see that the biggest number of products is shipped to California and New York.

Shipping Cost and Shipping Time in the 10 least profitable States. I created a similar dashboard to analyze the least profitable States. The table shows the average shipping cost for each segment by category. Technology is the category with the highest shipping fees. The maximum values are in the technology and furniture categories in each segment. We can observe that office supplies have the smallest shipping fees across all segments. A bar chart of the top 10 most profitable states shows the average shipping time for each shipping mode. Here we can see that First-Class average shipping is two days, the Second Class average shipping time is approximately three days, Standard Class shipping time is approximately five days and Same Day shipping takes less than a day. Here we can also see that most of the products are shipped by Standard Class and the least by Same Day shipping. We can also see that the biggest number of products is shipped to Texas. We can conclude that the average shipping time and the preferred mode of shipping for all states are the same.

The change in profit & sales by category in 5 most profitable States. In this dashboard, we can see how sales and profit changed in 4 years period. From a glance, we can say that profit increases each year. Throughout the years most profit generated is from selling technology products and the least profit is from selling furniture. We can see that the profit from selling furniture, technology, and office supplies products nearly doubled from 2017 to 2020. Let’s look at each year independently. In 2017 we can see that New York is the state with the highest total profit, even if we consider a small negative profit from selling furniture. The profit from selling technology products in New York is more than in the other 4 states combined. the results in 2018 are close to 2017, only the profits are higher. In 2019 we can see a change, California is taking the lead and becoming the most profitable state, we can see that in New York the profit from selling technology products is approximately two times lower than in 2018. In 2020 the profit from selling technology products in New York once more is highest approximately double what it was in 2019, but California is still the most profitable state. Let’s look at each year independently from the sales and quantity perspective. In 2017 New York had a much higher profit from selling a smaller number of technology products than California, even though the sum of sales was pretty much equal. In 2019 we can see an increase in the sum of sales in technology, although the overall quantity sold is slightly bigger than in 2018 and the profit is also slightly bigger, this could mean that the price of a unit of product has become more expensive. In 2020 the demand for technology products increased by a lot compared to previous years. Overall, from the quantity chart, we can see that California is the state that consumes the greatest number of products from each category.

The change in profit & sales by category in 5 least profitable States. In this dashboard, we can see how sales and profit changed in 4 years period. From a glance, we can say that the total profit in each category for the 5 least profitable states is negative each year. From the year 2017 to 2020 the minimum profit loss is from selling technology products and the most profit loss is from selling office supplies. Let’s look at each year independently. In 2017 we can see that Texas is the state with the lowest profit, the profit loss from selling office supplies in Texas is more than in 4 other states combined. In 2018 the results are a lot better, the profit loss from selling office supplies improved by approximately two times. The profit loss from selling technology products improved by approximately five times and profit from selling furniture fell. In 2019 we can see a change for the worse, the profit loss from selling office supplies and technology products increased. Profit loss for technology increased tenfold. In 2020 the profit in Texas from selling office supplies is again the lowest and overall, this category had a massive profit loss. Let’s now look from the sales and quantity perspective. Overall, the number of products sold in every category rose from 2017 to 2020. The sum of sales for each category also increased from year to year. The number of products rose as well as the sum of sales, but the profit was still negative, this could be caused by high discounts.

The impact of avg. discount in the US. In this dashboard, I will look at the distribution of average discount by categories in the top and bottom 10 states by profit. First, let’s look at the top 10 states, we can see that the top discount for every category is less than 12 percent. Let’s look at each category separately, the maximum average discount for furniture is approximately 10 percent, from the previous dashboards we know that California and New York have the highest sum of sales and number of products sold with positive profit. With this, I can assume that 10 percent is the average discount in California and New York that can motivate the buyers and bring profit. The maximum average discount for office Supplies is approximately 5 percent, the profit and number of units sold were steadily rising each year, we can say that the average discount for office supplies is optimal as they are always in demand and there is no reason to increase it. Let’s look at the technology category, I can see that in California the average discount is quite higher than in other states closer to 12 percent, from the previous dashboard we saw that Profit from selling technology products in New York was higher Than in California with a smaller number of units sold. The average discount for technology products in New York is less than 1 percent, so we assume that a higher profit is due to a lower discount.

Now let’s look at the 10 least profitable states by profit, and how the average discount is distributed there. From the first look, I can say that in each state and category the average discount is higher than 20 percent in some cases it even reaches 40 percent. From the previous dashboards we know that in these states the profit is negative, that’s why I can assume that the high discount is at fault for the negative profit.