ST2187 COURSEWORK REPORT

BUSINESS ANALYTICS, APPLIED MODELLING & PREDICTION

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EXECUTIVE SUMMARY

Business is a various and immensive field of complex. Business comes from a wide range of categories, it could be an apparel, furniture, real estate, or any business. However, in the process of analysing business, it is not an odd sight to see a set of data being processed and predicted. Companies are trying to seek validation from the data and trying to find a more suitable and effective approach for its business. Everyone knows that competing in the business field is not an easy task to achieve, companies always want to generate the most profit, thus, they invest more on business and data analyst to help the companies for yielding a better yearly margin revenue. Here, we also give some plausible recommendations for the senior management that hope will optimize their work for the greatness in the company's future.

Here, we make a story that consists of five dashboards using insightful and interesting visualizations. Those visualization graphs will guide us to a deeper comprehension of the exact and estimate number of values, current trends, and possible prediction in the latter years. The several visualization graphs that we used in Tableau are bar chart, maps, pie chart, line chart, area chart, circle view, and lastly dual combination. The five dashboards are covering the overview of overall sales, profit overview that focusing on US only, category analysis, shipping cost analysis, and lastly, forecast analysis. Ending the report, we will also provide a conclusion of all the highlight explanations of the story.

INTRODUCTION

Data set given from UOL was from December 31, 2016-December 30, 2020. It consists the company's performance and its value of sales, profit, shipping cost, and others, also list of products, order data, and shipping data. We will convert the data to become an easier insight to observe and give some plausible suggestion. To minimize confusion between sales and profit, sales is the cumulative total generated value from product sold that has not been deducted yet from the primary goods price, while, profit is the total value after it being deducted.

STORY OVERVIEW

DASHBOARD 1.OVERAL SALES ANALYSIS

Story 1

FIGURE 1 - DASHBOARD 1 (OVERALL SALES ANALYSIS)

From the maps, colours ranging from deepest to slightest indicating the highest to lowest total sales. United States and Australia are the top 2 countries in contributing yielding the most sales with approximately $2M and $900,000 respectively. Eritrea and Equatorial Guinea have the lowest total sales of an average of $169.125. The value might be true due to the size of population each country which will result in comparable total sales.

The pie chart shows that order priority is ranging from critical to low order priority. People are preferring medium order priority rather than the other 3 order priorities. Medium has the biggest size chart of 57.59%, followed with high with 30.12%. It has a significant gap between medium and low as big as 53.1%, which the value nearly has the same percentage as medium order priority.

APAC (Asia-Pacific) generated a consistent growth from 2017-2020 and broke the sales record on 2020 with $1,209,199. The average growth each year of APAC is approximately $190,080.90 indicating a good improvement. However, Canada is the contradiction to APAC with average value of $16,732 in the span of 4 years. EU, LATAM, and US also showed a good increase. Furthermore, as LATAM and US have similar total sales, especially in 2019, US is always leading over comparatively number of sales. However, Africa and EMEA did not earn that much sales.
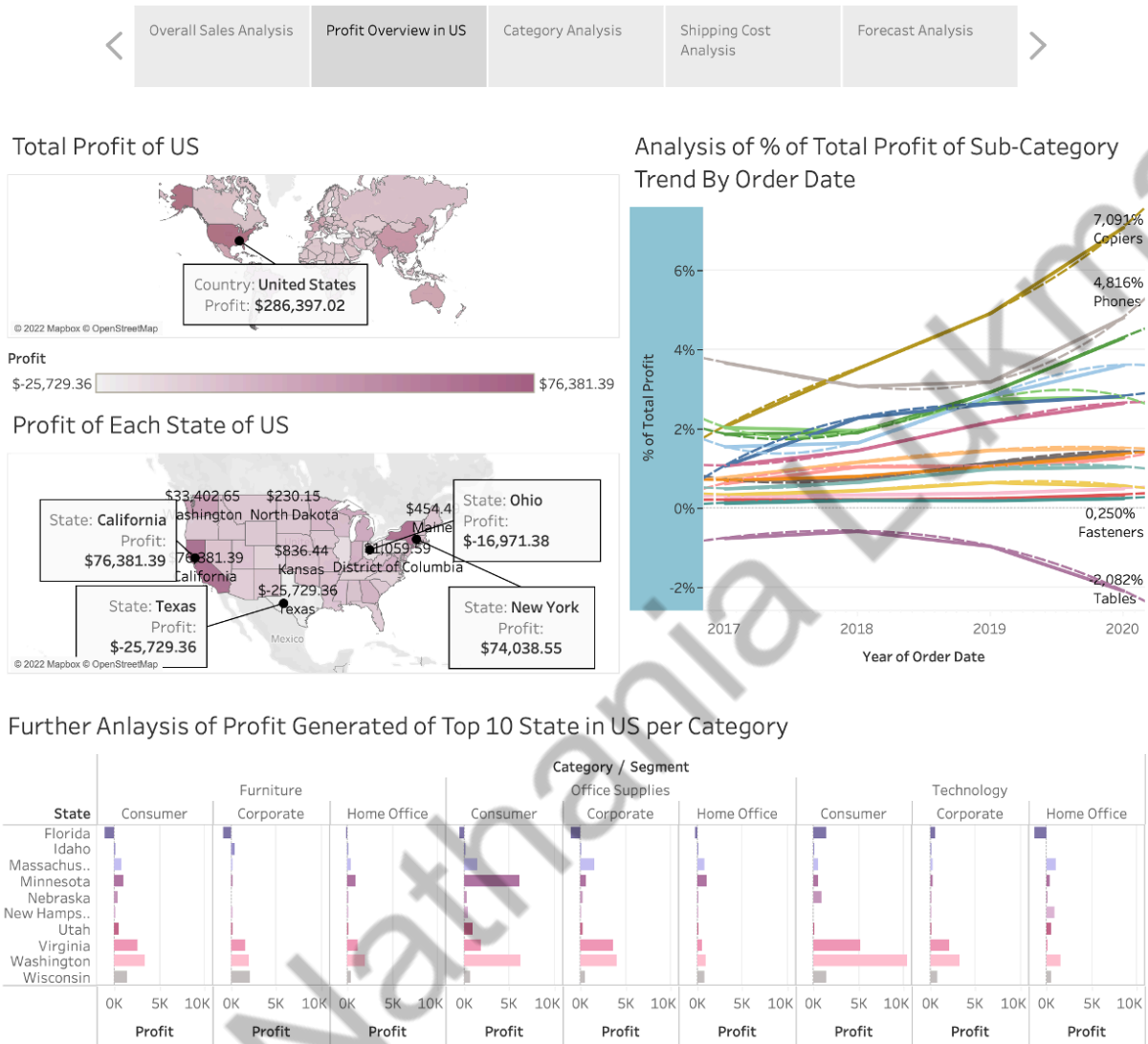
DASHBOARD 2. PROFIT OVERVIEW IN US

FIGURE 2 - DASHBOARD 2 (PROFIT OVERVIEW IN US)

For easier comparison, we will observe the profit overview in US as our preferred country. US did not just earned the most sales, but profit too with $286,397.02. California and New York brought around $75,209.97 of profit while Ohio and Texas as the bottom 2 states generated losses of -$16,971.38 and -$25,729.36 subsequently. It indicates the primary cost surpassing the total sales, if not, it will be resulting in surplus. Nonetheless, the rest of the states have a good profit return with only less than 10 states generate losses.

In early 2017, phones participated in giving 3,675% of profit and was the trendiest. However, phones experienced a decline during late 2017 until 2019, during that time, copiers made a grow spurt in

terms of trends and profit until 2020 with 7,091%. Tables found to be always at loss and its trend always died out. It only increase by a small margin during 2017-2018 and fell significantly to -2.082% on 2020. The rest of the sub-category made an average growth and some significantly rose over the years.

Listing down top 10 US states can help us to see the comparison profit each market by category. Washington yields an outstanding profit in each category and segment, especially in technology with more than $10K. Florida seems to loss some profit and only has return value in 2 categories. Afterall, it is valid as on the maps earlier, Florida has a profit of -$3399.

DASHBOARD 3. CATEGORY ANALYSIS

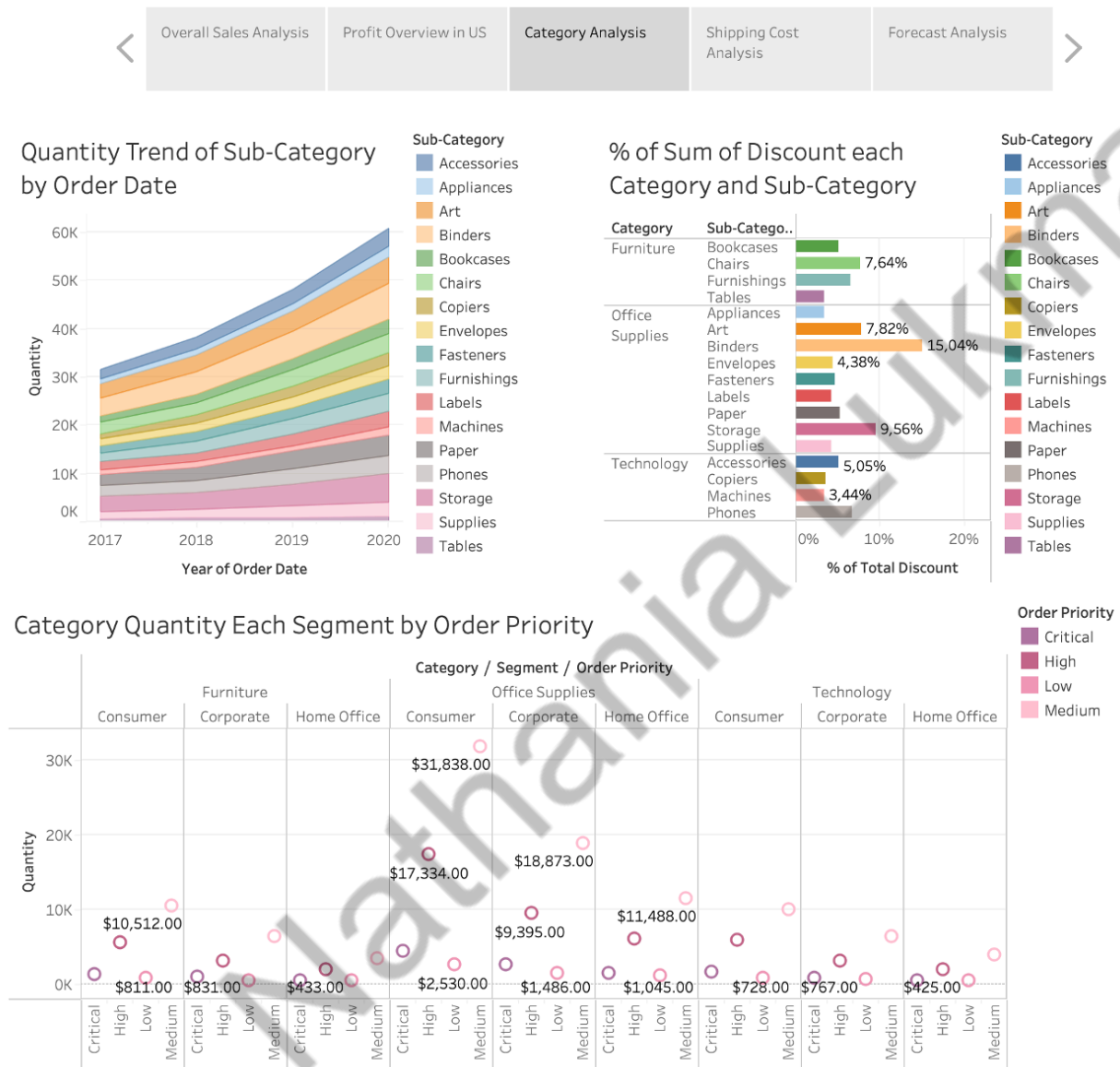| Overall Sales Analysis | Profit Overview in US | Category Analysis | Shipping Cost Analysis | Forecast Analysis |

FIGURE 3 - DASHBOARD 3 (CATEGORY ANALYSIS)

Similarly with the % profit of sub-category trend previously, the quantity result is quite similar. Tables only sold less than $1K, which indicates a poor marketing strategy. Here, binders always ranked first and storage came in second amongst, even though copiers was leading in term of profits. Appliances, machines, and tables were not that appealing to customers with the approximately quantity of less than 3000. Besides, the trend for each sub-category seems to increase throughout the years.

Quantity and discount are proven to be correlated as binders and storage have the highest discount of relatively 15.04% and 9.56%. High discount can imply the corresponding total quantity each

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product. The rest of the products appear to have a normal discount percentage, as long as it does not have a negative value, it is consider to be an average to great result.

Earlier, medium order priority was the preferable. Based on category quantity each segment, medium also comes first in every segment, the highest quantity is on office supplies of consumer with $31,838.00. Corporate and home office have a constant total quantity because both are more anticipated. It is seen that neither of all make losses.

DASHBOARD 4. SHIPPING COST ANALYSIS

| Overall Sales Analysis | Profit Overview in US | Category Analysis | Shipping Cost Analysis | Forecast Analysis |

Sum of Shipping Cost by Order Priority

Order Priori..
- Critical — $234,823.94
- High — $509,545.87
- Low — $65,633.08
- Medium — $542,812.82

Shipping Cost

% Of Sum Shipping Cost by Ship Mode

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

Standard Class 45,43%
First Class 22,77%
Same Day 8,57%
Second Class 23,22%

% of Sum Shipping Cost Each State

Washington 1,011%
Montana 0,023%
North Dakota 0,013%
South Dakota 0,009%
Wisconsin 0,242%
New York 2,363%
New Hampshire 0,058%
Oregon 0,133%
Idaho 0,031%
Nebraska 0,059%
Utah 0,092%
Indiana 0,280%
District of Columbia 0,013%
California 3,593%
New Mexico 0,043%
Oklahoma 0,163%
Mississippi 0,065%
South Carolina 0,062%
Texas 1,282%
Florida 0,532%
West Virginia 0,007%
Wyoming 0,008%

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% of Total .. 0,007% — 3,593%

% Shipping Cost Trend by Ship Date

Ship Date

34,18%
26,95%
20,92%
17,96%
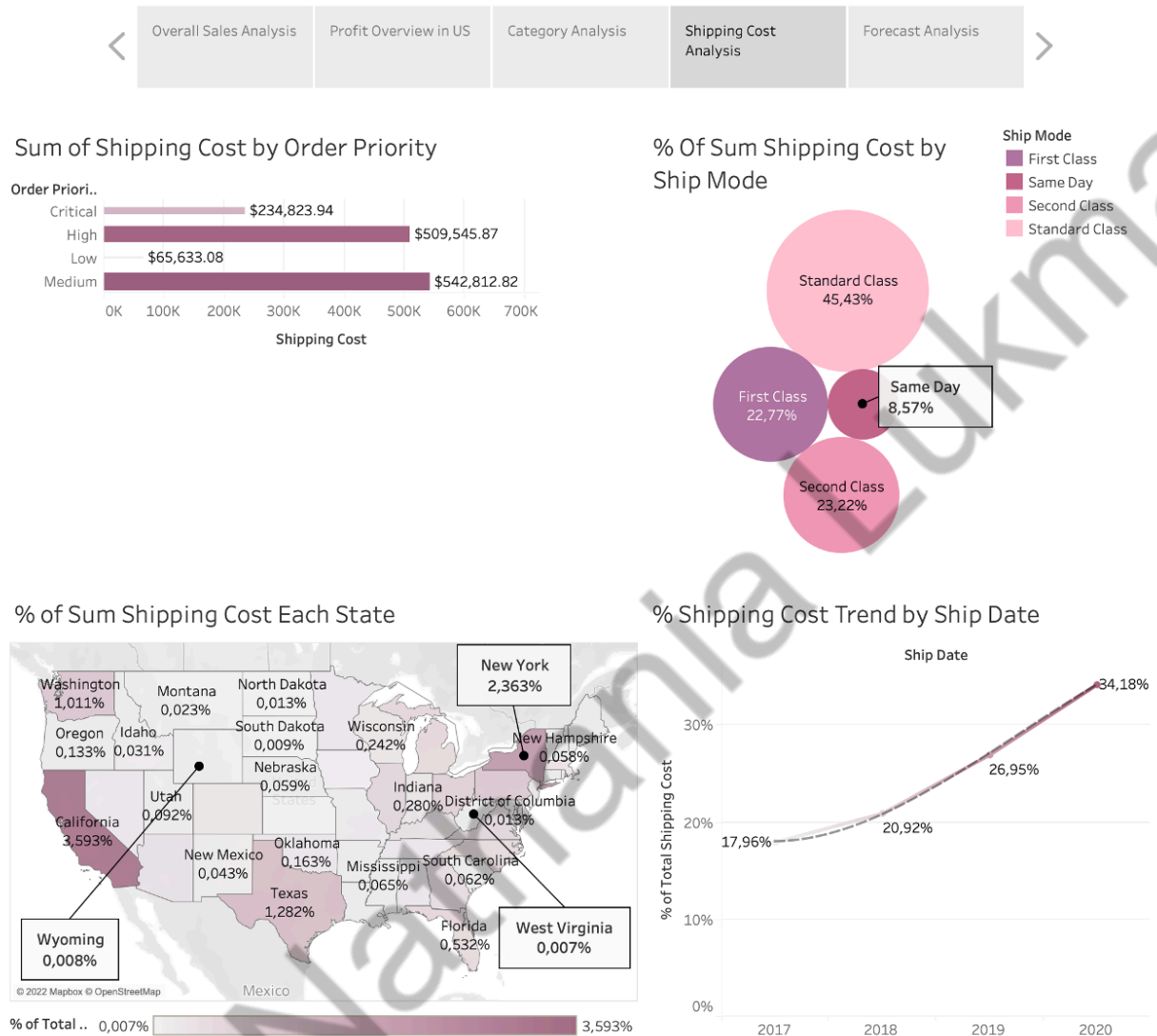
2017 2018 2019 2020

% of Total Shipping Cost

FIGURE 4 - DASHBOARD 4 (SHIPPING COST ANALYSIS)

Medium order priority has an extraordinary value for all aspects, as it also rank first in terms of shipping cost with $542,812.82, followed with high order priority with $509,545.87. However, there is a consequential disparity on the bottom 2 and the top 2.

Standard class offers an affordable shipping cost, explaining the reason why it is the highest with 45.43%. Some customers might think that it is not wise to spend money on first class mode as standard or second class offers similar services with cheaper price. That is why first class came in third and the last is same day with 8,57%.

To see the shipping cost from each US state, California and New York contributing making the highest percentage of 3.593% and 2.363% respectively. It is logical as both generates the highest profit. Higher the demand each product, will result in higher the profit generated, which will increase the shipping cost each states. However, Florida does not have the lowest % of shipping cost (which was ranked last based on profit generated), but West Virginia with 0.07%.

Correspondingly, the trend and profit increase together over the years. That being said, the % trend for shipping cost began with 17.96% in 2017 and end with 34.18% in 2020. Moreover, prices are always inflated each day.
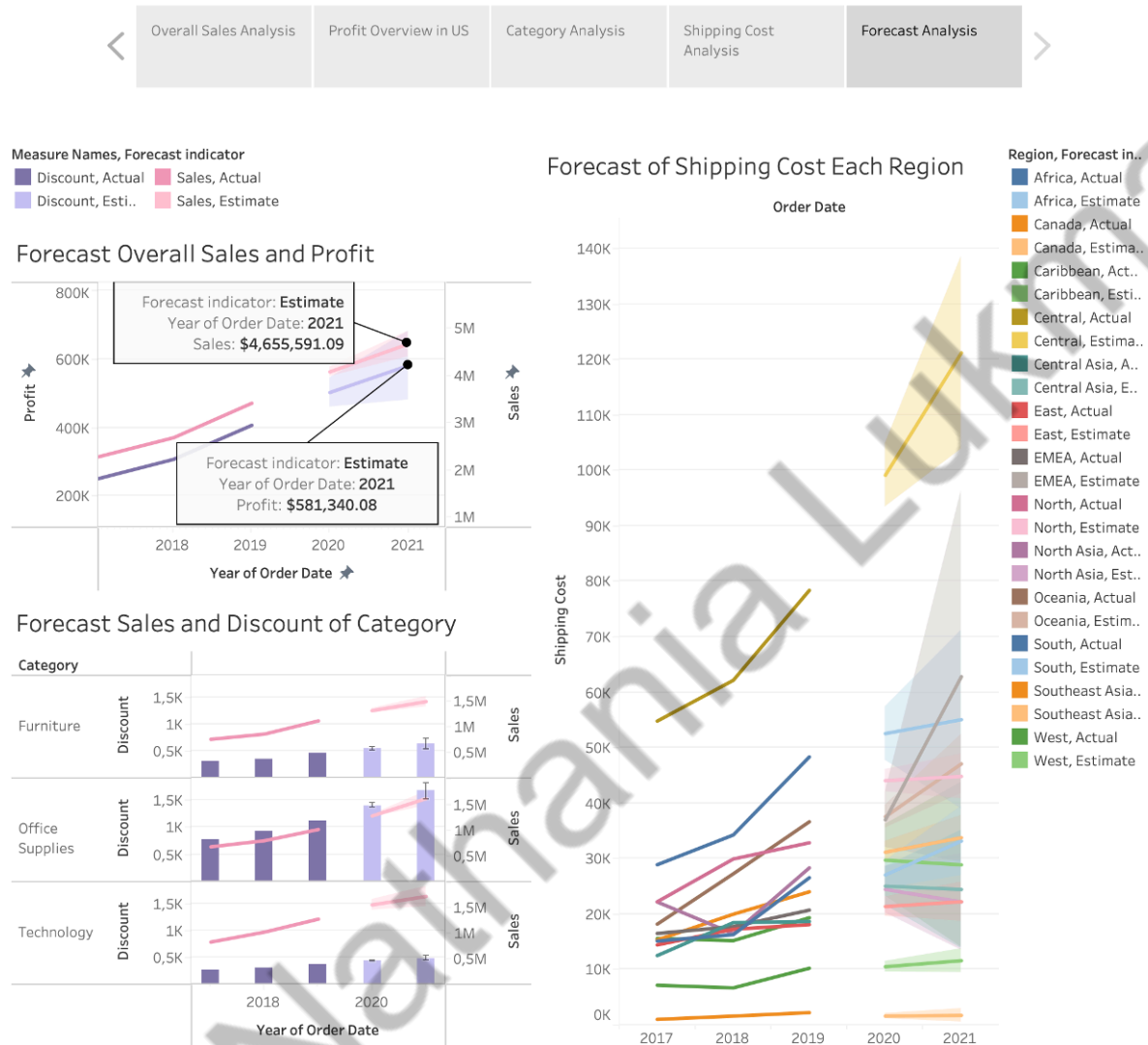
DASHBOARD 5. FORECAST ANALYSIS

FIGURE 5 - DASHBOARD 5 (FORECAST ANALYSIS)

From early 2017, profit and sales move in a constant gap until the estimated year in 2021, indicating a positive sign of balance. Sales and profit are predicted to rose to almost $5M and approximately $580,000 respectively. Profit will always below sales as profit has already been calculated from the deducted primary good price.

Sales and discount rose by a small margin over time, except for sales in technology, which was steeper among the rest. For office supplies category, discount unexpectedly always surpassing sales, the plausible reason for this is company offer abundant of discount that will lead to a smaller sales, explaining why sales is increasing slowly. Quite a comparison because for the other 2 categories, both

sales and discount have relatively wide gap. Overall, all is predicted to approximately reach $1,5M in 2021.

Every region is predicted to have an increase estimated shipping cost, especially for EMEA and Central who have the steepest estimate number, $62,804 and $121,175 respectively. However, the others have little differences with the current and estimated numbers. The graph shows that West, Central Asia, and North Asia will unexpectedly experience a decline during 2020-2021.

CONCLUSION

From all the analysis and visualizations above, US is a remarkable country as it leads in terms of profit, sales, and shipping cost. US is considered as a developed country, it is wise to start a business here as there are many opportunities, not to mention, having a good economic growth. However, countries in Africa is the contradiction to US. They need an improvement in their economic growth so their countries can proceed to be more open to opportunities whilst having an abundant of resources.

For category and sub-category, binders and storages have the highest demand and also offer topmost percentage discount. Tables did not sell well during those 4 years, it could be from insufficient strategy or people did not show much interest to tables.

Shipping cost works similarly with sales and profit. It will increase if the other also increases. It can be seen that people are wise on deciding for shipping mode. People will go for an affordable ship mode and correspondent order priority.

Overall gap in the visualizations might be caused of the existence of more innovate products, fluctuated prices for products and in terms of global supply chain, and the increase in the population size. To be concluded, sales, profit, and shipping cost are always increasing over the years and predicted to rose. Nevertheless, the trend always changes depends on the circumstances.

RECOMMENDATIONS

Some recommendations we could give to senior management are to increase price and give more discount to products which could increase profit each region that still makes losses. Also, eliminate defect products or surplus in inventory. Moreover, products with the least quantity and sales might be more profitable if are sold in different occasion like inventory clearance sale.

As tables do not generate much profit (always at loss) and the trend has always died out, it is recommended to be removed from the sub-category list and alter our focus to the others that is more profitable as it did not show any changes over the years and innovate new products.

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