

ST2187 COURSEWORK REPORT

BUSINESS ANALYTICS, APPLIED MODELLING & PREDICTION



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# Executive Summary

Tableau provides several tools that are able to help us to make a visualization from the excel data set provided from UOL. The visualizations will show us deeper insight of the exact and estimate number of values, current trends, and possible prediction in the latter years.

Overall concept, sheets will be compiled into a several dashboards then will proceed to be gathered into one whole story through a proper relation and grouped concept.

Here, we are listed down the visualization graphs that we used in Tableau :

1. Bar chart (horizontal bar chart)
2. Maps
3. Pie chart
4. Line chart
5. Area chart
6. Circle view
7. Dual combination

## Introduction

Visualization we have made comes from the excel data set provided from UOL, which is a data from the year 2021-2022 with total of 51,290 rows. The visualizations graph will show us a deeper insight of the data set, not to mention the possible forecast for years onwards, but also some plausible suggestion for better data result in the following years. In the excel data set 2021-2022, sales are the total generated value from products sold that has not been deduct yet from the primary goods price, while, profit is the exact generated value from sales after it is being calculated from the other related price.

## Methodology

From this coursework report, hopefully we are showing our capabilities on making business or plausible visualizations using Tableau from data given that were taught to us during our second year of study.

## **Story Overview**

### Dashboard 1.Overal Sales Analysis

Diagram

Description automatically generated

*Figure 1 - Dashboard 1 ( Overall Sales Analysis )*

The overall total sales each country with colours range indicates the highest to the lowest sales. From the graph, we stated the top 2 ( US and Australia ) and the bottom 2 countries (Eritrea and Equatorial Guinea ) for value comparison. The stated value might be true due to the size of population each country which will result in comparable total sales.

The overall % sales by order priority, which are critical, high, medium, and low that are differentiated by several colours. The size of each 4 parts of the chart presenting the highest to lowest value. We can see that customers are preferring medium order priority with 57.59% to low order priority with 4.49%.

The total sales generated from each market by order date (2017-2020). Seven markets are differentiated by seven different colours. Throughout the years, APAC (Asia-Pacific) always ranked first in terms of sales and broke the record with the highest sales in 2020 of $1,209,199, while, Canada is the contradiction to APAC with average of $16,732 in the span of 4 years. The rest of the markets were also displaying a good sign of increased value of sales. All of these might be done due to increase of population size each market and more of innovative and modern products sold in each market.

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### Dashboard 2. Profit Overview in US

Diagram

Description automatically generated

*Figure 2 - Dashboard 2 ( Profit Overview In US )*

In the introduction part earlier, we already mentioned the difference between sales and profit. Thus, in this dashboard, we wanted to present a profit overview in our preferred country, US.

Both of the maps showing the highest to lowest profit through colours range. In the first map, it is seen that US generated profit as much as $286,397 (ranked first among the other countries) with top 2 states of California with $76,381 and New York with $74,039 and the bottom 2 states of Ohio with -$16,971 and Texas with -$25,729. Each state in US generates a good profit while only less than 10 states generate losses.

The % of total profit of sub-category by order date to see which type of products generating the most profit. Phones participated in giving 3,675% of profit and was the trendiest in early 2017, however, copiers made a grow spurt in terms of trends and profit until 2020 with 7,091%. It is seen that from the beginning, tables always made losses and its trend always died out. The rest of the sub-category made an average growth and some significantly rose from 2017-2020.

For easier analysis, we listed down the states into top 10 states in the US to see the profit generated each segment per category. Washington made a good profit for all segments in each category, especially technology with $10,295, while Florida always came last. However, it is not an odd insight as it was explained from the maps earlier that Florida generated -$3399 profits.

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### Dashboard 3. Category Analysis

Chart

Description automatically generated

*Figure 3 - Dashboard 3 ( Category Analysis )*

Similarly with the % profit of sub-category trend previously, the quantity result is quite similar with the size indicates the highest to lowest quantity and also it shows a good growth each year. Binders and storages were very high in demand among customers. Moreover, appliances, machines, and tables were not that appealing to customers with the approximately quantity of less than 3000. To minimize losses, we must not put too much focus for the least or top 2 least-trendiest sub-category as it did not show any changes over the years.

The analysis based on % discount also have similar outcome as the area graph, the highest discount was come from binders and storage, might also be the reason why those two have the biggest quantity amongst. Companies are clever by giving discounts to their highest products sales to attract more customers and gain more profits. Products with the least quantity and sales might be more profitable if are sold in different occasion like inventory clearance sale.

The category quantity each segment have relatively low quantity for critical and low order priority, while, in each segment for each category, medium order priority always have the highest quantity followed with high priority. The highest medium order priority was at $31,838 quantity.

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### Dashboard 4. Shipping Cost Analysis

Chart, diagram, bubble chart

Description automatically generated

*Figure 4 - Dashboard 4 ( Shipping Cost Analysis )*

The total shipping cost by order priority have different size and colours indicating the highest to lowest shipping cost. It can be seen that medium priority is the preferable followed with high priority, $542,813 and $509,546 respectively. However, there is a significant gap between the top 2 and the bottom 2.

Standard class usually offers an affordable shipping cost, explaining the reason why it is the highest with 45.43%. Some customers might go for second class as it is not that different while saving up some money. Furthermore, some customers could 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%.

Higher the demand each products, will result in higher the profit generated, which will increase the shipping cost each states. The theory is true as the total % of California and New York come as the top 2 highest shipping cost with 3,593% and 2,363%. However, Florida does not have the lowest % of shipping cost (which was ranked last based on profit generated), but West Virginia with 0.07%.

From all the analysis before, it is known that each states will generate more profit throughout the years, also increasing the demand each products. That being said, the % trend for shipping cost will also rose from 2017-2020, began with 17.96% and end with 34.18%. The gap of 16.22% in the span of 4 years might be due to the increasingly sophisticated technology and the existence of more innovative shipping mode. Not to mention, prices are always inflated each day.

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### Dashboard 5. Forecast Analysis

Graphical user interface, application

Description automatically generated

*Figure 5 - Dashboard 5 (Forecast Analysis)*

Forecasting is a prediction made for the upcoming years and usually, the numbers are always predicted to be higher than the current and previous years due to inflation and increase of product desired by people.

Both overall of sales and profit are increasing in a constant gap, the estimated number also have constant gap, which showing a positive sign of balance. The profit will always be below sales because sales value has not been deduct yet from the primary goods price. Sales and profit are predicted to rose to almost $5M and approximately $580,000 respectively.

From early 2017 until the estimated year 2021 for category office supplies, the discount is forecasted to surpass the sales, which is quite odd because in the other category, sales and discount have a relatively wide gap. It might be due to the seller has given an abundant of discount so the price becomes very cheap, thus, even though it has many sales, the total of sales will increasing slowly and will not have a huge gap in between. Overall for all 3 categories, it 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. Global supply chain always becomes the problem because the cost of distance and the transportation are always fluctuated each day.

## 

## Conclusion

Based on analysis, it can be concluded that the sales, profit, and shipping cost are always increasing over the years and predicted to rose once again. However, the trend always changes depends on the products.

## 

## Recommendations

From analysis above, some recommendations we could give are :

1. 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 change our focus to the sub-category that is profitable. Also, can alter our focus to innovate new products.

2. Increasing price and giving more discount to products could increase profit each region that still makes losses Also, eliminate useless things, like defect products or surplus in inventory.

## 

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