ST2187 Business analytics, APPLIED MODELLING AND PREDICTION coursework

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Executive Summary: This report illustrates how the business has grown since its start in 2016 all the way to 2020. The first dashboard details an overall view on the growth of the business worldwide. The second dashboard shows how costs, sales and profits have changed throughout the years. The third dashboard identifies the customer rankings, that is, who are the most beneficial customers to the business and who are loss making for the business. The fourth dashboard highlights which categories and sub-categories have yielded the highest sales to the business and the final dashboard represents how many customers have used each ship mode and the average shipping cost for each mode.

Introduction to the data set: The business is assumed to be a retailer and an e-commerce firm, which deals in transactions in goods to customers electronically, over the Internet. According to the data set the business currently deals with 795 customers in 147 countries worldwide, sells a total of 17 sub-categories under the main categories of Furniture, Technology and Office Supplies.

# 1.0 The Overview

Map

Description automatically generated

As seen in the above diagram The United States, in the US market, has contributed to the most sales for the business totaling, 2,297,201 and a respectable profit of 286,397. The Second highest is Australia in the APAC market, contributing to a sales figure of 925,326 and a profit of 103,907. On the other hand, it can be seen that the countries in Africa has contributed the lowest to sales overall, however in total it has yielded higher than the final calculated total for Canada, which ends up contributing the least sales and profit, which is visible in the graph below.Chart, scatter chart

Description automatically generated

## 2.0 Showing how profits and costs changed over time

Since the initial day of conducting business in 2016, the firm has grown massively in sales revenue and profits however, it can be noticed that the costs have grown exponentially as well.

Chart

Description automatically generated

Bar chart

Description automatically generated with medium confidence

As the diagrams above illustrate, technology is currently dominating the rest of the categories, since its initial start of sales in 2017 and still ends up having the highest sales at the end of the year of 2020, being 1,616,159 and profit of 234,928, followed by furniture at 1,378,056 sales and a profit of 89,312 and finally office supplies with a total sales figure of 1,305,652 and a profit figure of 179,926. Technology has continued to be the highest sales figure out of all the categories from 2017 to 2020 and also has the lowest cost. However, the business should figure out how to reduce the costs incurred from selling furniture due to it having the highest figure in total so far, adding up to past 3,500,000. In order to tackle this the firm should try negotiating with its suppliers and find cheaper raw materials for the production of their products as well as get cheaper materials for the packaging of its products in order to bring down the total costs.

### 3.0 Analysing customer growth

Graphical user interface

Description automatically generated with medium confidence

The business has expanded its customer base massively since 2017 and have the sales and profits to prove it. The sales for furniture have gone from 756,079 in 2017 to almost twice that value in 2020, and the same goes for the other categories as well which have doubled both their sales and their profits over the span of 4 years. To add further detail, the diagrams below have shown off which customers have contributed to profits of the business as well as the losses to the business.

Chart

Description automatically generated

Chart, bar chart

Description automatically generated

The customers Tamara Chad, Raymond Buch, Sanjith Chand, Hunter Lopez, Bill Eplett and Harry Marie have contributed to the highest sales for the business, while Denise Monton, Skye Norling, Candace McMahon, Grant Thompson, Luke Foster and Cindy Stewart are one of the biggest losses for the business. The customer by the name of Tamara Chad has helped yield the highest profit for the business, adding up to over 8,000 and the highest sales of over 35,000. Meanwhile the customer with the name of Cindy Stewart has been the most loss inducing customer for the business with a loss of over 6,000 and one of the lowest sales figures around 13,000. As seen in the diagram that highlights the rankings in detail, it can be seen that the category of technology is what contributes to the huge loss in selling to Cindy Stewart. The reason might have been the expensive materials required to create the specific machines that Cindy had ordered which resulted in the higher total cost which reduced the overall profit for the business. In order to solve this the business can try to purchase technology that assists in the faster and cheaper production of those machines, essentially cost advantages, so the business can achieve technical economies of scale.

#### 4.0 Comparisons between discounts and sub-categories

Chart, pie chart

Description automatically generated

As seen in the above diagram and mentioned before Technology has proven to yield the highest profits for the business and how much each sub-category has yielded has been illustrated in the diagram. Furthermore, it can be noticed in the diagram below, that copiers has contributed to the highest profits for the business earning past 250,000. On the other hand, tables is shown having a loss past 50,000, which was one of the reasons furniture could not score higher as the category with the most sales.

Chart, scatter chart

Description automatically generated

Chart, bar chart

Description automatically generated

To further identify the loss for tables, the above diagram shows that the average shipping cost for tables is the highest so far passing over 80, moreover, the average discount given for tables is also the highest, being over 0.25% or 25% off the price. This may be the reason as to why tables made such a loss for the business, so it is recommended for the business to try and lower the shipping cost by finding a cheaper shipping mode and also reducing the discount given to customers for tables so that in the future the profit margin will be high enough not to incur further losses.

##### 5.0 Trends between costs, profits and sales

Chart, bar chart

Description automatically generated

As seen in the above diagram, the number of customers individually for each category, are well over 1000, and office supplies having the highest quantity sold so far, ranging past 30,000. However, its sales is seen to be the lowest out of the three categories and its profit is the second highest being over 3,000,000. The reason as to why office supplies has yielded moderate profit even due to the highest quantity sold, must be due to the lower price office supplies are sold at when compared to the other categories. Further, office supplies have the lowest average shipping cost as well being less than 20, which may be the reason why customers were so encouraged to buy so many office supply products, so in order to yield the highest sales and profit possible, the business is advised to increase the individual prices for office supplies and take advantage of the situation.

Table

Description automatically generated with low confidence

Chart, scatter chart

Description automatically generated

In more detail, the business has a good record of delivering its first-class shipments on time with a total of 4,850, however, it can be seen that the number of late shipments is abnormally high for standard class ship modes, and the values for second class and first class are also very high. The business is advised to find better modes of shipment which makes sure that the standard class shipments on high order priority make it in time so customers will not be dissatisfied and it would help the reputation of the business if they do so.

###### Conclusion

As mentioned before, in order to solve all the problems listed, the business should try finding cheaper suppliers for raw materials for the production of their products which would also help get cheaper materials for the packaging of its products which would contribute to the overall reduction of its total costs. Moreover, to solve the issue of higher costs for the production of certain sub-categories in technology, the firm should seek out technology that would boost the efficiency and speed of creating those products so that they can bring down the cost even further. And finally, in order to make sure that tables do not keep contributing towards a loss for the business any further, the business should find cheaper shipping modes to reduce the average shipping cost and also give a lower discount to customers for tables so that tables would yield a profit instead of a loss in the future.

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