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COURSEWORK

EMFSS ST2187

BUSINESS ANALYTICS, APPLIED MODELLING AND PREDICTION

Executive Summary

The goal of this report is to examine the details of the sale of various goods by one corporation, to understand what makes a great profit, and to find out the reason for the growths and declines in sales in order to make recommendations, which can help to increase the total profit of the company.

According to the done visualizations it can be seen that the most profitable category of the products is technology. Compared to office supply and furniture it has the most profit, equal to 663,779, and sales, equal to 4,744,557. Moreover, correspondence between discounts on technology and its marginality, or profit to sales ratio, makes it the best category to concentrate on.

As the attention is paid on technology, it is considered from different angles. Firstly, sales of technology are not stable, but they fluctuate similarly for all the markets: in some months sales are high for all the markets and in others are low. There is an inverse relationship between discounts and sales of this category. Secondly, turning to the subcategories, copiers make the largest total profit with not the highest sales. Moreover, the trend of copiers' sales is the most ascending. It is also worth mentioning that accessories have quite a good profit compared to sales, although their trend is stagnant.

Copiers can be seen among the outliers for the positive profit, while machines are negative outliers of profit. Thirdly, analyzing sales of technology, corresponding to the amount of orders: sales decrease more due to a reduction in the number of orders, than due to their size.

All the recommended actions are connected with the regulation of the sales due to the applying discounts.

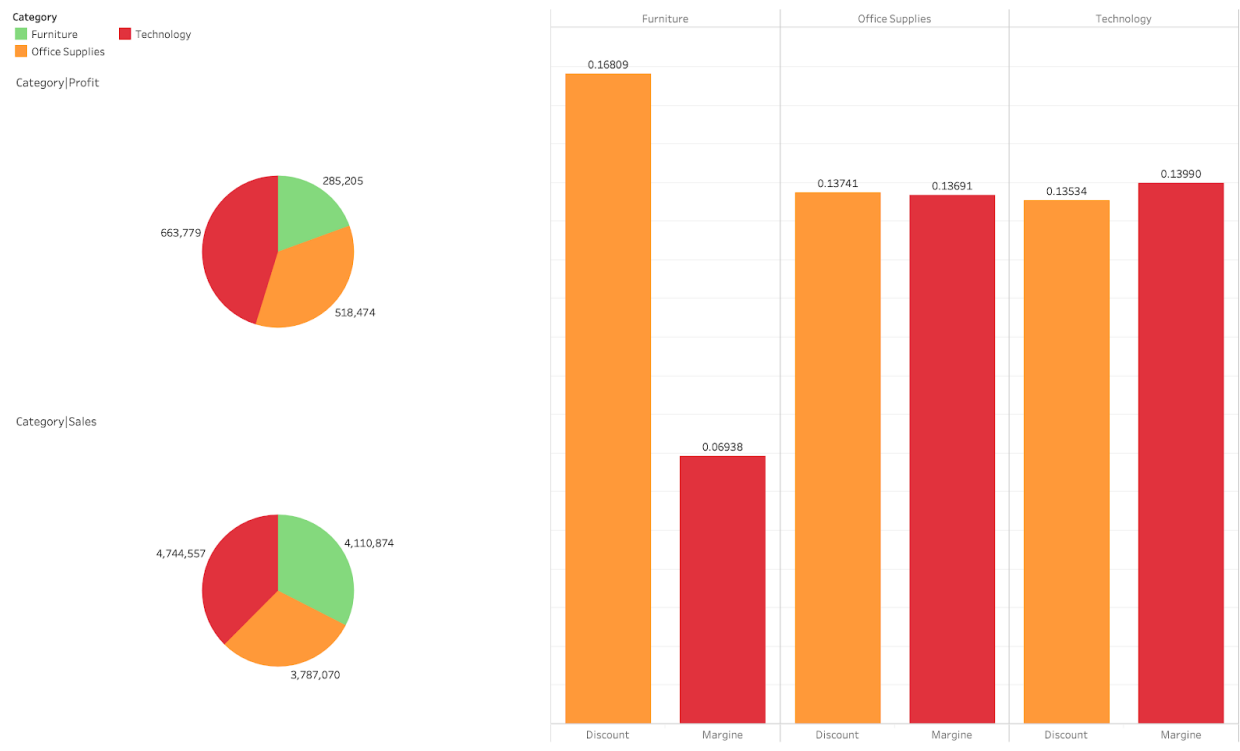
It is recommended:

- To concentrate on technology sales (the most profitable category)
- To avoid sharp seasonal changes in discounts (to make sales more stable)
- To control the sales of different subcategories by discounts (e. g. stimulating copier sales with discounts and promotions)
- To enlarge the number of orders at the periods, when it decreases (some special offers)

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Dashboard 1

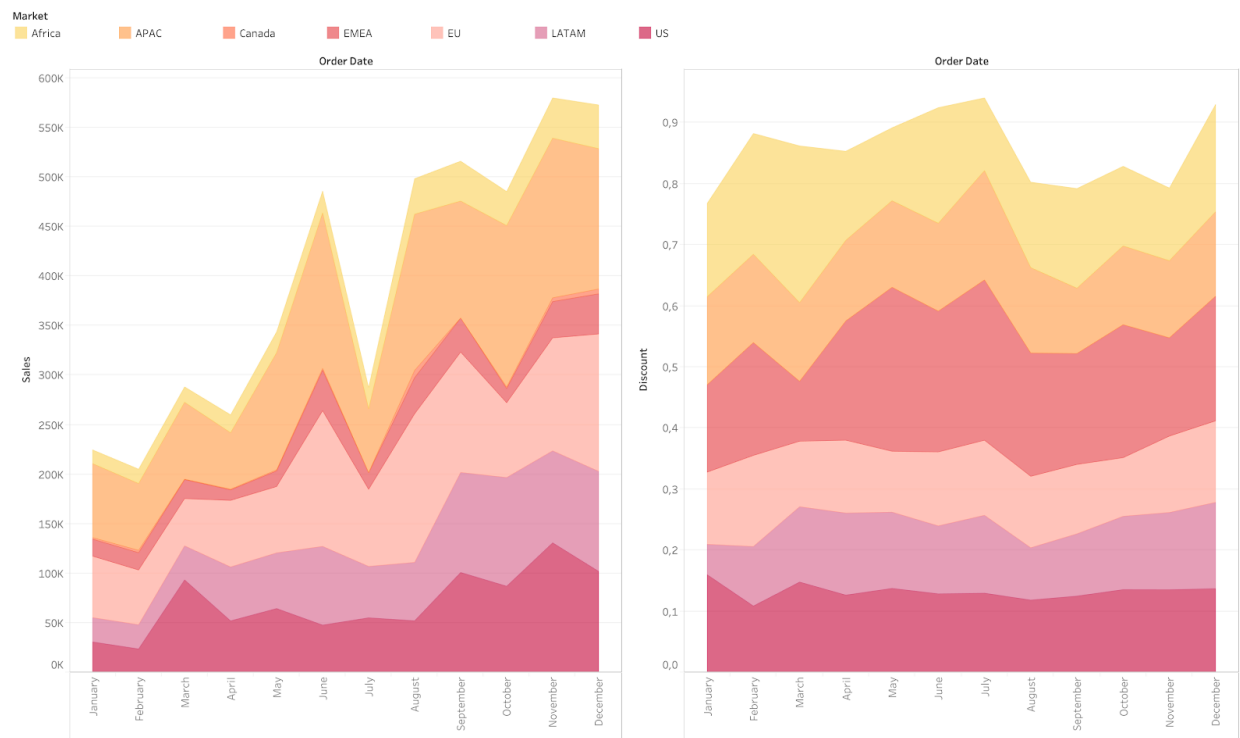


The goal of the first dashboard is to look through the data, related to the product categories, in the table provided and show the contribution of each category to company performance. The ratio of profit to total sales will be calculated to show how profitable it is to sell certain products.

There are 3 widgets on the dashboard. The pie charts show profit and sales for three categories: technology, office supply and furniture. From these two visualizations it can be seen that technology has the most profit and sales, whereas office supply and furniture are worse in these parameters. The third graph is a bar chart, which is divided in three parts, according to the products categories. For each type of the product it shows the average discount that is made and the value of the profit to sales ratio. It can be noticed that the highest profit to sales value is for technology, while the discount for this category is the smallest. On the contrary, the largest discount is made for the furniture and the profit to sales value for this category is the lowest.

Summarizing all the observations listed above it can be concluded that it is better to concentrate on technology, because they bring both absolutely and relatively (in the form of profits to sales) a lot of profit, which means if the focus is made on strengths, the performance can be greatly improved. Also, this category is not heavily discounted, which means the products are popular at their current (not bad for us judging by the profit to sales) prices.

Dashboard 2

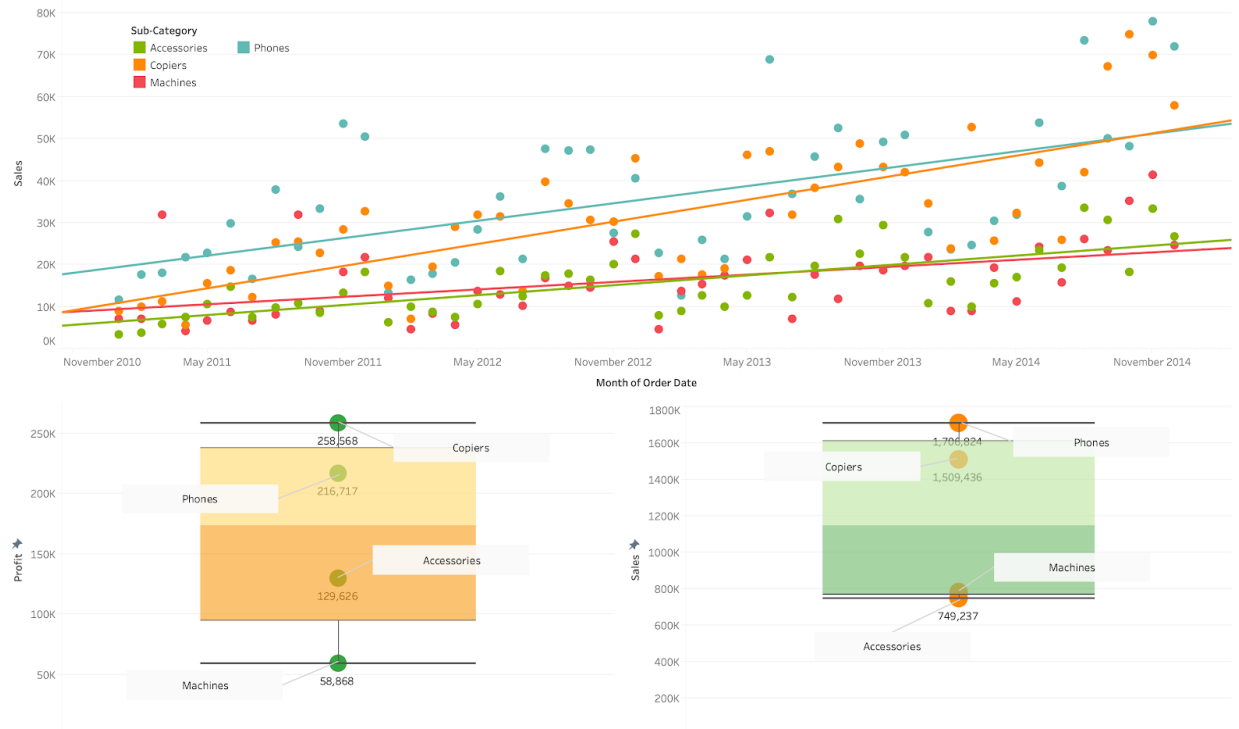


As to the conclusion made from the first dashboard analysis it is better to concentrate on the technology, so the second dashboard will visualize the sales and discount distribution for technology through the year. The visualization will be done for all the markets.

There are 2 widgets on the dashboard. From the left graph it can be seen that sales are not stable, but they are fluctuating similarly for all the markets: in some months sales are high for all the markets and in other are low, for instance, sales in November are the highest and equal to 40 656 units for Africa or 161 195 for APAC, whereas in July sales are the lowest for most of the markets, like 21 661 units in Africa and 64 254 for APAC. From the right graph it can be seen that discounts are also not stable during the year (the fluctuation is also almost parallel for all markets), for example, for EMEA market discount in June is 0.2306 and in July is 0.2627. Then, the situation is similar for all the markets: sales and discounts are strongly dependent on seasonality. Moreover, there is an inverse relationship between discounts and sales: the higher discounts lead to the lower sales. It can be explained by the stable amount of products realized: if the quantity of goods sold stays the same, but the price is lower, so the total sales are less.

Taking all mentioned above into consideration, the main suggestion here is to avoid sharp changes in discounts. In order to make sales more stable it is better to exclude rapid seasonal increasing and decreasing in discounts, as from the seasonality in the discounts follows the seasonality in sales.

Dashboard 3



Continuing to delve into technology production, this dashboard is constructed in order to show the subcategories that make up the technology. This will provide a more detailed look at this category and show the contribution of each product type to the company's performance.

There are 3 widgets on the dashboard. The box plots in the bottom part of the dashboard show the detailed numeric information connected with the profit and sales parameters. The scatter plot in the upper part of the dashboard shows the distribution of the total sales for each subcategory through the fixed time period. It can be seen from the graphs that copiers make the largest total profit with not the highest sales. Moreover, the trend of copiers' sales is the most ascending. Turning to the machines, it can be noticed that the trend is growing slowly and sales are quite small. It is also worth mentioning that accessories have quite a good profit compared to sales, although their trend is stagnant.

Therefore, there are several suggestions according to the three outlined subcategories. Firstly, since copiers are in a growing sales trend, future profit can be increased by stimulating copier sales with discounts and promotions. For example, if a certain amount of goods is bought, a discount can be provided, or another product can be given as a gift. Second, machines' prices can be raised. Machine sales are not high enough, so profit can only be exaggerated by increasing prices. Thirdly, to increase future profit from the sale of accessories, the discounts can be offered. Accessories bring quite a large profit, relative to its sales, so the discounts should be slightly increased, because we should be quite satisfied with profit now, but wish to raise sales a bit.

Dashboard 4

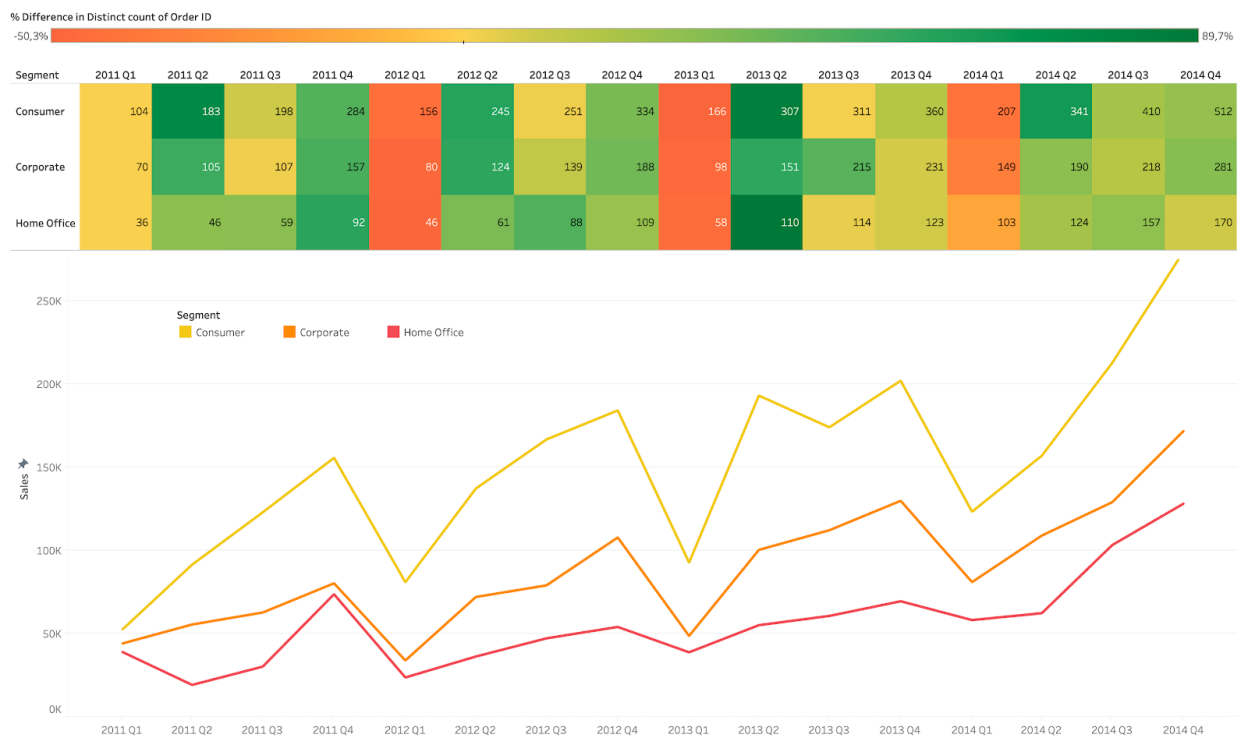


Diving deeper into the analysis of the most profitable category, technology, each subcategory will be considered to determine the relationship between the profit and shipping cost.

There are 2 widgets on the dashboard. The right bar chart demonstrates the average shipping cost for every subcategory. It can be seen that copiers have the highest average shipping cost and machines correspond to the middle value. If attention is paid to outliers on profit, presented on the left graph, copiers can be seen on the positive side, and machines can be seen on the negative side. Talking about machines, their position among outliers is associated with relatively large shipping costs, whereas for the copiers it is not always true.

According to the observations described above, we can conclude that it would be good to provide a discount to buyers of copiers to compensate part of the cost spent on shipping, since in general there is a resource for this as copiers bring much profit even with high shipping costs. However, according to the big negative profit we can conclude that there were too large discounts for machine buyers which is given, analyzing the graphs, to compensate large shipping costs for them, but on the same levels of shipping costs there are no large profits from machines, thus such discounts do not pay off, and in the future large shipping cost for machines are better not to be covered with a discount.

Dashboard 5



Proceeding with the technology category, this dashboard is constructed to visualize how the segments buy technology and how the orders of technology are distributed during the fixed period of time.

There are 2 widgets on the dashboard. The upper one is the highlighted table, which shows the percentage difference in distinct counts of various orders for every quarter from the previous. The line graph in the bottom part of the dashboard presents the amount of sales for every segment for the same period of time divided into quarters. It can be seen from the dashboard that sales are fluctuating during the whole period of time for every segment of customers. There is a connection between sales and the amount of orders made, which is also not stable and changes every quarter. Sales decrease more due to a reduction in the number of orders than due to the size of orders, so the actions should be aimed precisely at increasing the number of orders.

The suggestion can be to make some special offers aimed at enlarging the number of orders at the periods, when it decreases. For example, there can be a discount on the next order provided or free setting up of the gadget can be offered. Besides, these actions are better to be done for the consumers' segment as fluctuation of their sales is the biggest.

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