Business Analysis Report

Module – Business Analytics, Applied modelling and Prediction (ST2187)

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Table of contents

1.EXECUTIVE SUMMARY

This report is an analysis of a retail company and the analysis has been divided into 5 sections. A descriptive analysis has been performed to identify the most profitable country, market, segment etc… A predictive analysis was performed to identify the future growths using the current pattern. For instance, the shipping cost.

The APAC was discovered to be the most profitable market and United States (US) as the most profitable country. Countries like Canada have a greater chance of bringing in more profitable customers, although currently it is the market with the lowest sales. This is due to Canada having the highest profit to sales ratio.

The technology is the most profitable category. The most profitable customer Tamara Chand's largest proportion of the profit is contributed by the technology category. In the sub-category analysis, it was identified that tables are a key sub-category which contributes to a loss. Therefore, the sales of tables should be minimized to the regions which contribute to a loss. Moreover, the home office segment is the segment with the largest profit to sales ratio.

All shipments were shipped within a week where most of the total orders were shipped using the standard mode which is the cheapest ship mode. Moreover, **38.2%** of the shipments were shipped late.

Furthermore, recommendations have been provided at the end of the report on how to approach the problems identified such as adjusting discounts given, embracing new market strategies to increase retail partnerships and be more cost efficient.

2.INTRODUCTION

The exploratory data analysis for this study considers data between the years 2018 to 2021.The analysis was done across 147 countries which is divided into 7 markets.

Key indicators such as the profit to sales ratio, new and repeated customers, average discount, Shipping status were calculated.

Each order ID is unique, and an assumption was made for the Shipping Status as mentioned below.

- Shipped late: If the number of days taken to ship > the scheduled days to ship

- Shipped early: If the number of days taken to ship < the scheduled days to ship

- Shipped on time: If the number of days taken to ship = the scheduled days to ship

The table below shows the number of days scheduled based on the ship mode.

Ship mode	Scheduled days to ship
First class	1
Second class	3
Standard class	5
Same day	0

Figure.2.1

3.ANALYSIS

3.1 OVERALL ANALYSIS

The total quantity sold during the four years was **178,312** and the total shipping cost was **1,352,816**. The most profitable country is US and the market with the largest sales is APAC (**3,585,744**).
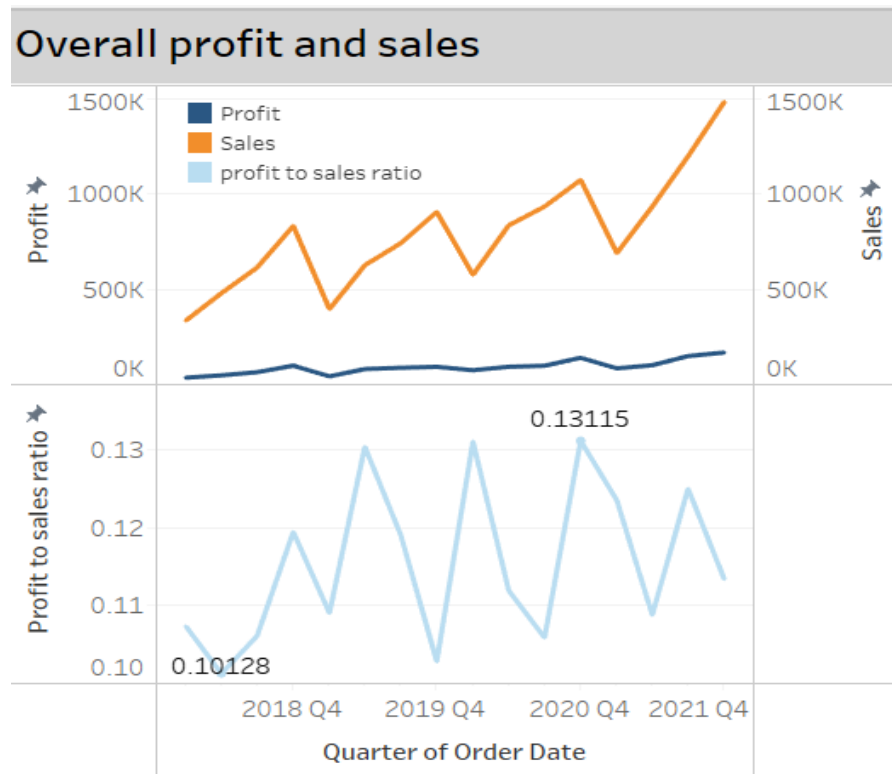

figure.3.1.1

The graph denotes that there is an overall increment in sales and profit over time, but the increment of sales is more significant than the profit which is why the profit to sales ratio increment is low. The percentage increment is **29.5%**. This denotes that overall, the market is profitable, but the level of profitability is almost constant along the 4-years. There are periods where the sales are at peak with the highest in 2021, while some periods the sales have drop. This could be due to seasonal changes.
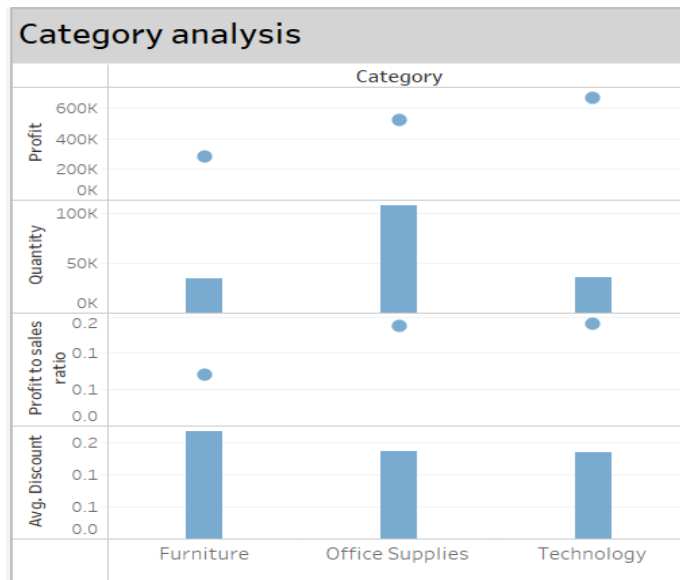
figure.3.1.2

It's apparent that the most profitable category is technology although the quantity sold is low. This could be due to technological products being expensive and having a low discount. The highest quantity sold is for the Office supplies with its profit to sales ratio being similar to technology , although the profit is low compared to technology. Furniture is the least profitable category, and this could be due to a large discount being imposed.
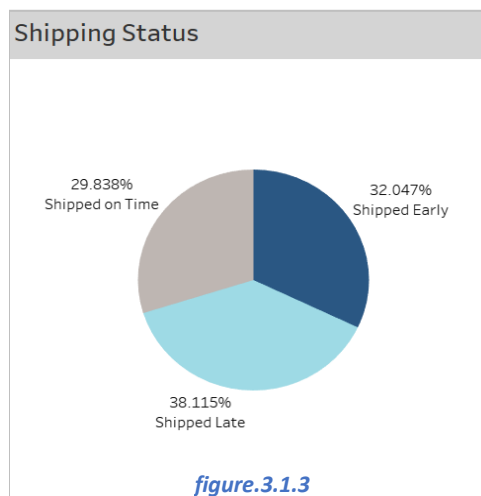

figure.3.1.3

Using the assumptions made in figure.2.1 a summary of the shipping status is shown in figure.3.1.3. It portrays that most of the shipments were shipped late followed by shipped early and shipped on time. Hence, the company has been doing well in terms of shipments as **61.8%** of the shipments were shipped on time or early.
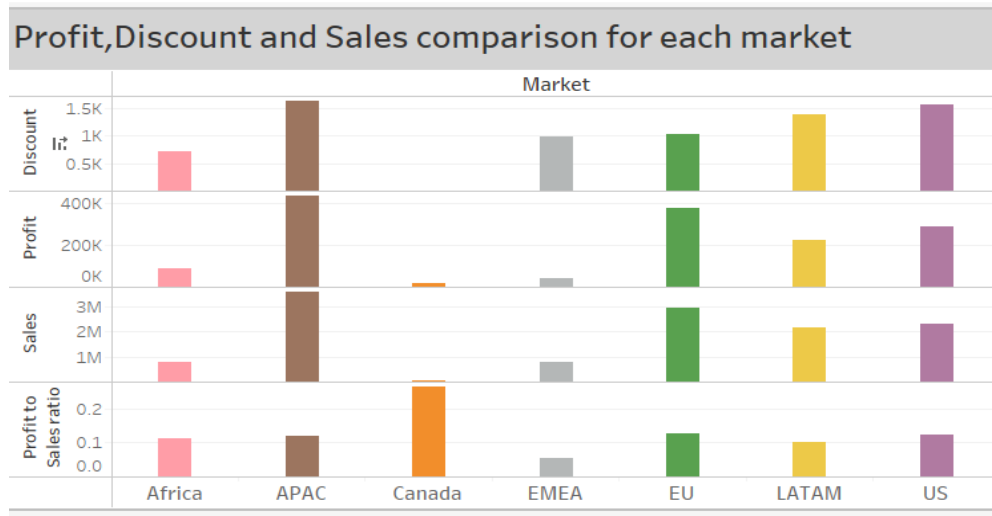
3.2 MARKET ANALYSIS

figure.3.2.1

Figure.3.2.1 shows the profit, Discount, Sales and profit to sales ratio for each market. It is noteworthy that the most profitable market is APAC, but Canada is the market with the greatest profit to sales ratio.
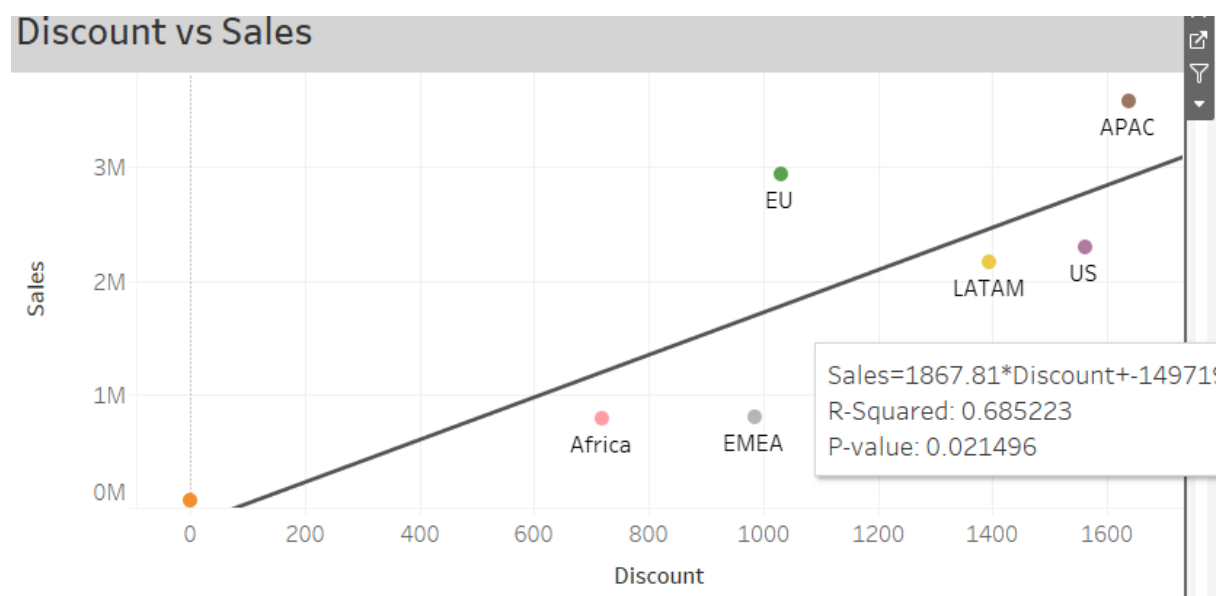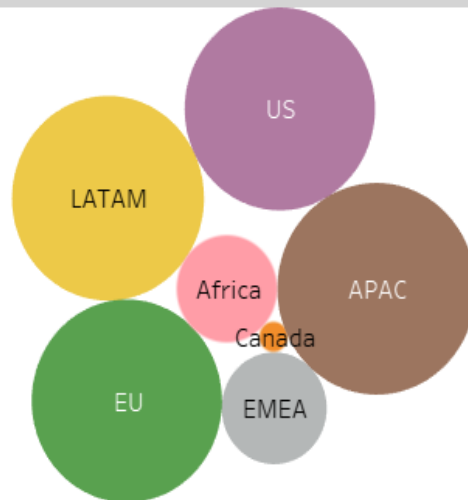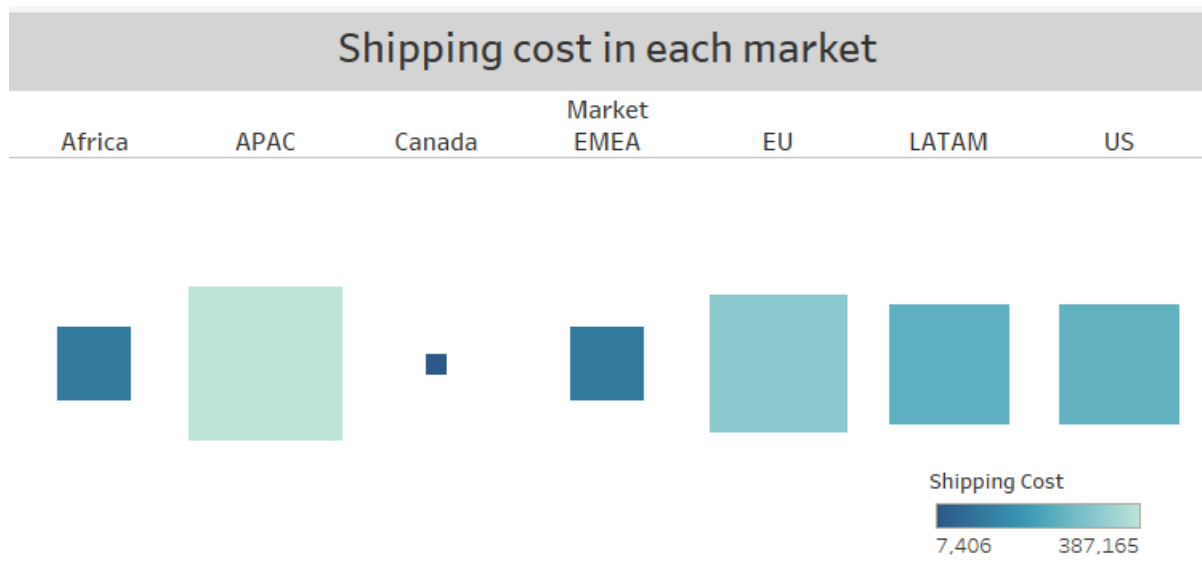

figure.3.2.2

Quantity sold

figure.3.2.3

Figure.3.2.2 shows that there's a positive linear relationship between discount and sales with a R squared value of **0.685**. This depicts that the sales for Canada is low since no discount was given. Which is proven further by figure.3.2.3. It shows that the quantity sold for Canada is the lowest, hence the sales for Canada are low, thereby reducing the profitability of Canada. Increasing the sales for Canada will increase the profit significantly as the profit to sales ratio is high.

figure.3.2.4

Figure.3.2.4 demonstrates the total shipping cost for each market. The shipping cost for Canada is the lowest and the highest for APAC. This could be another possible reason as to why Canada has the greatest profit to sales ratio and not APAC, even though APAC is the most profitable market.

3.3 APAC ANALYSIS

It was noted from figure.3.2.1 that APAC is the most profitable market but not with the highest profit to sales ratio. To analyse this further, an analysis for the APAC is done .
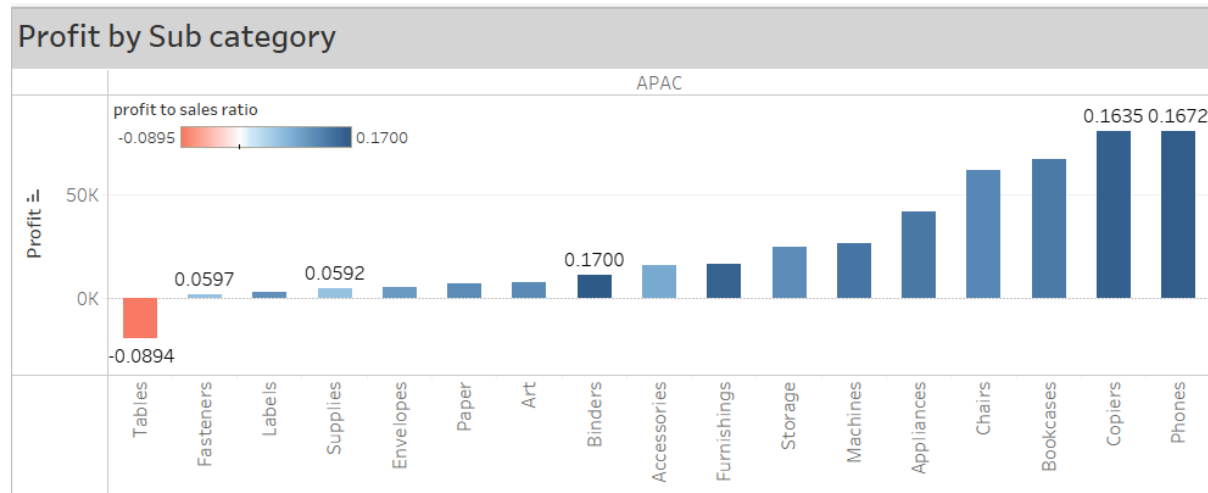

figure.3.3.1

Considering the APAC market, figure.3.3.1 illustrates Phones as the most profitable sub-category and tables as the least. The profit to sales ratio is labelled for the sub-categories with the highest 3 and lowest 3 profit to sales ratio. Binders is the product with the largest profit to sales ratio, but the profit contributed by it is low.

figure.3.3.2

The average discount given to tables is the highest. This explains the losses made due to Tables. The lowest discount was given to Binders and this product has the largest profit to sales ratio. This implies that providing higher discounts increases the possibility of incurring losses.

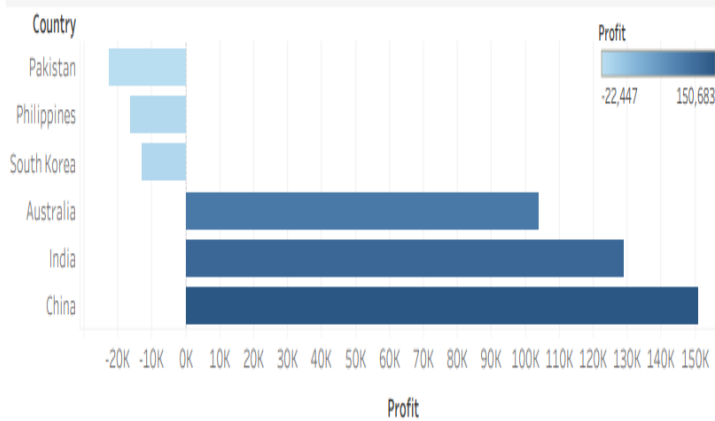Analysis of the highest 3 and lowest 3 profitable countries in APAC
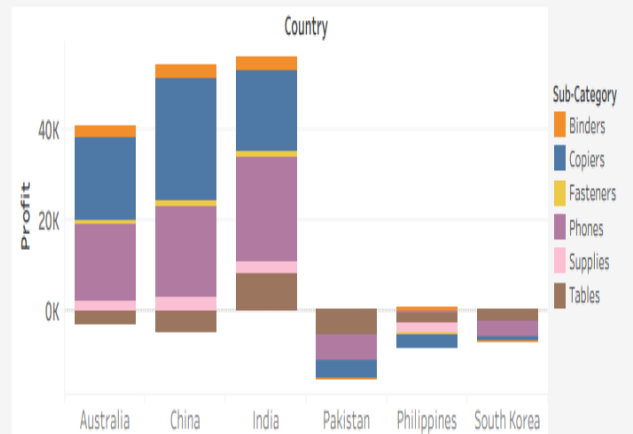
figure.3.3.3   *figure.3.3.4*

Figure.3.3.3 demonstrates the highest 3 and lowest 3 profitable countries in the APAC market.

Analysing the countries shown in Figure.3.3.3 and considering the subcategories where the profit-sales-ratio is labelled in figure.3.3.1, figure.3.3.4 demonstrates that the profit contributed by binders (subcategory with the largest profit-sales-ratio) is mainly by the top profitable countries. Tables contributed a loss for most of the countries except India. All products sold to Pakistan and South Korea incurred a loss. Binders is the only product that generated a profit to Philippines.

3.4 SHIPPING ANALYSIS

Overall shipping cost

figure.3.4.1
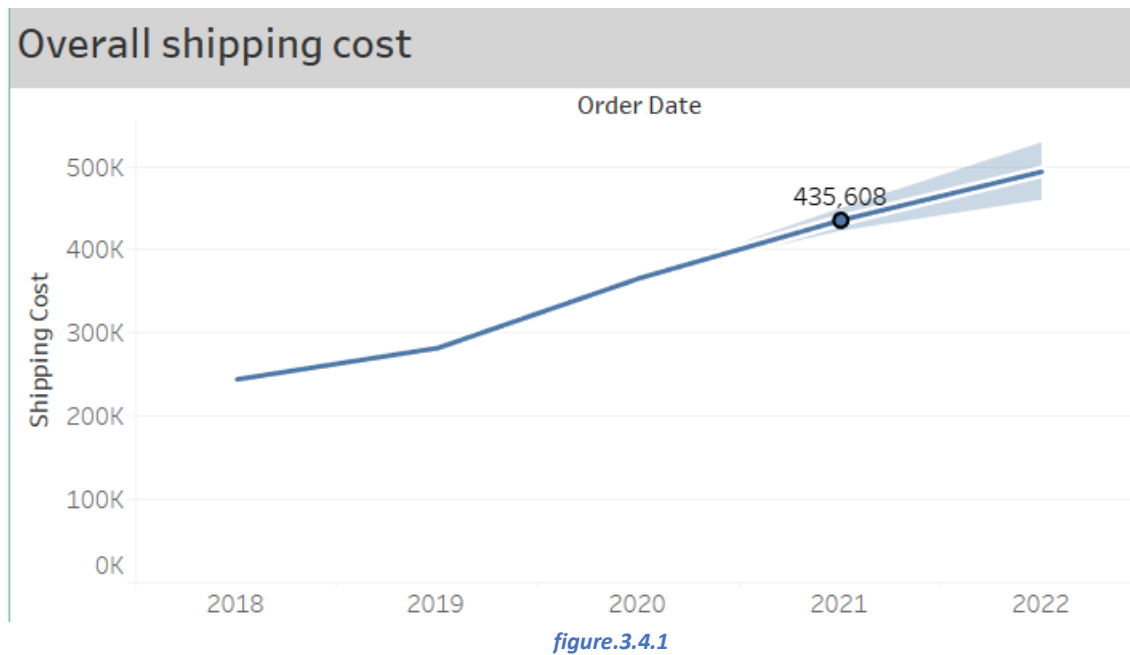
The graph includes a forecast indicator and illustrates that the total shipping cost increases over time. It is noteworthy that the shipping cost in 2021 shown in the graph (**435,608**) is the forecasted value but the actual shipping cost for 2021 was **460,506**.

Ship mode analysis

Ship Mode	Avg. Shipping Cost	% of Total orders	Quantity
First Class	41	14.63%	26,039
Same Day	43	5.27%	9,230
Second Class	30	20.10%	35,724
Standard Class	20	60.00%	107,319

figure.3.4.2

The most frequently used shipping mode is the standard class, which is the cheapest ship mode. While the same day ship mode is the most expensive ship mode and used the least.
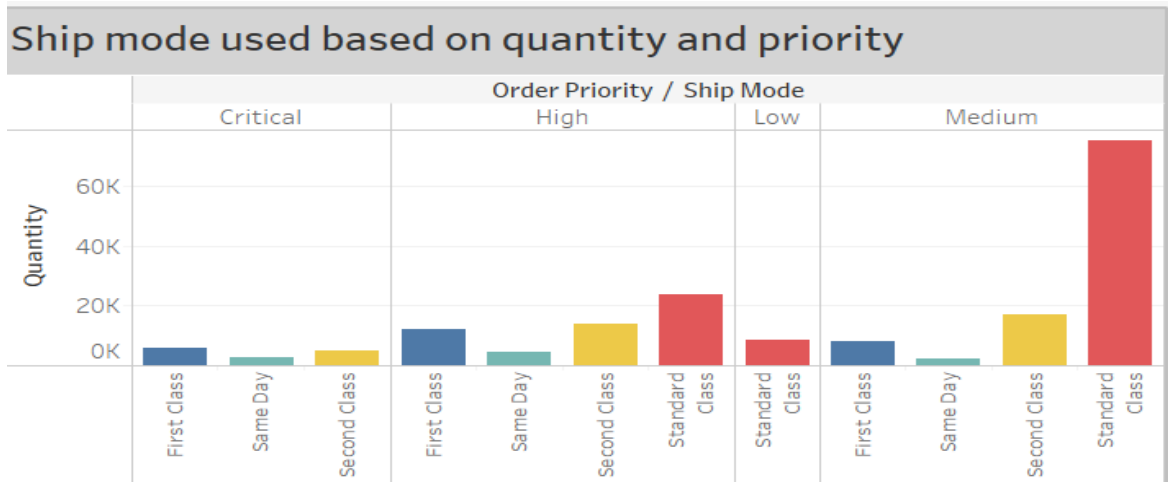
Ship mode used based on quantity and priority

figure.3.4.3

The graph illustrates that besides critical, majority of the shipments under each order priority were shipped by the standard class. This is due to the standard class being the cheapest ship mode. Shipments are shipped by the first class, same day and second class only when the order priority is not low.
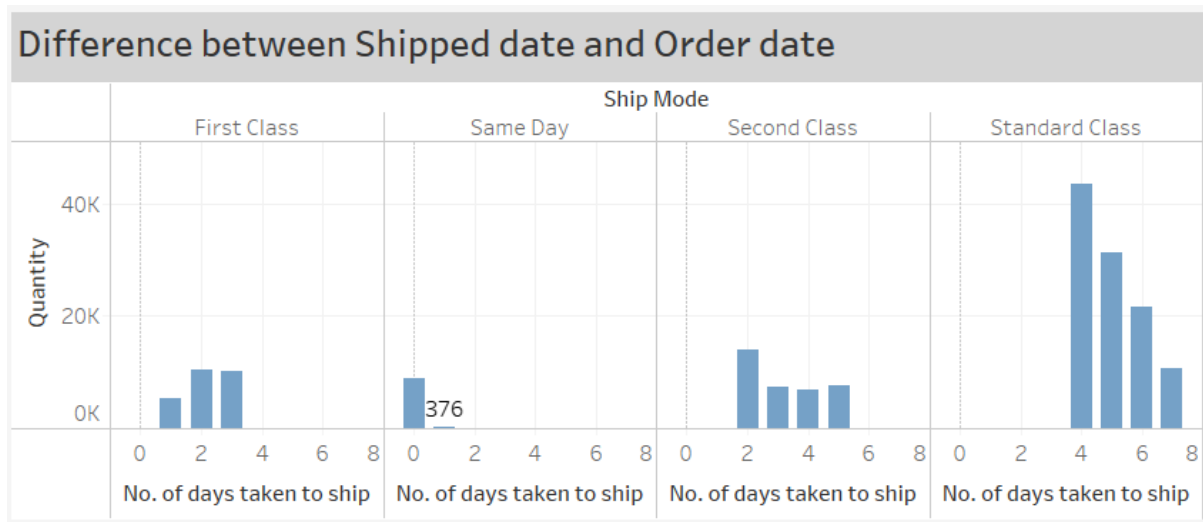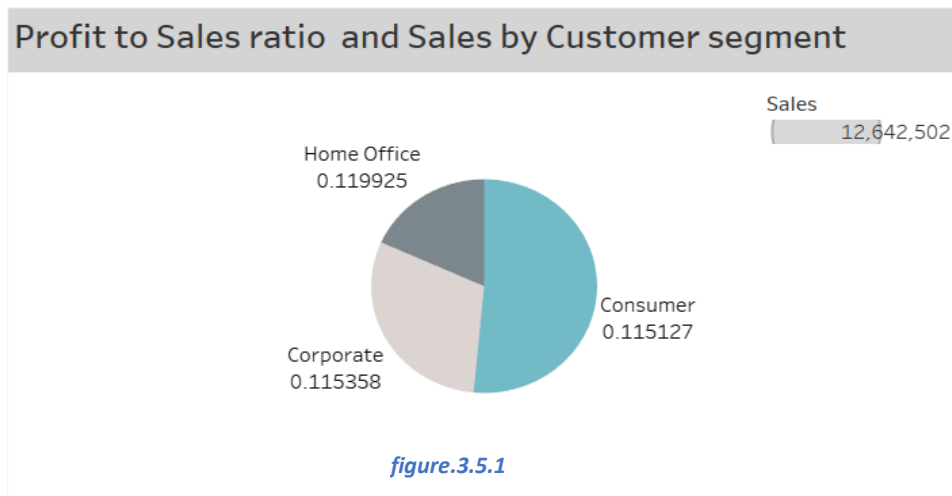

Difference between Shipped date and Order date

figure.3.4.4

Figure.3.4.4 shows that all the shipments were made within a week. Using figure.2.1.2 it was concluded that there are goods which were shipped late as the number of days taken to ship were more than the scheduled number of days. For instance, **376** of the goods under the same day ship mode which had to be shipped on the day ordered (as mentioned in figure.2.1) were shipped late by a day. Standard class shipped the goods the latest. This could be a reason as to why it is the cheapest shipping mode.

3.5 CUSTOMER ANALYSIS

Profit to Sales ratio and Sales by Customer segment

Sales
12,642,502

Home Office
0.119925

Consumer
0.115127

Corporate
0.115358

figure.3.5.1

Consumer segment contributes to the largest sales, but the segment with the largest profit to sales ratio is home office.

Top 5 Profitable countries

United Kingdom
France

United States

China

India

Profit
109,029 — 286,397
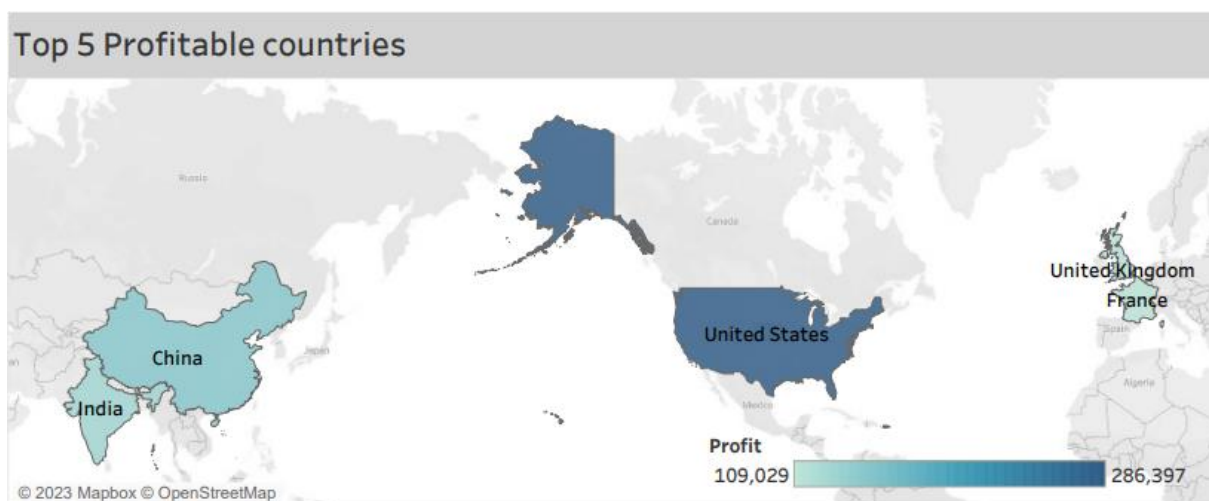
© 2023 Mapbox © OpenStreetMap

figure.3.5.2

Figure.3.5.2 demonstrates the top 5 most profitable countries. This is imply that the most profitable customers are from these countries.

New and Repeated customers

Customer Status	2018	Order Date 2019	2020	2021
New	1,309	209	57	15
Repeat		1,163	1,401	1,496
Grand Total	1,309	1,372	1,458	1,511

Figure.3.5.3

Customer ID is considered unique for each customer. The total number of customers for each year has increased over time, but the number of new customers each year is reducing. This depicts that the company is retaining its old customers, but no strategy was implemented to gain new customers.

Top 5 most profitable customers

Category	Bill Eplett	Hunter Lopez	Raymond Buch	Sanjit Chand	Tamara Chand
Furniture	463	504	-848	470	-837
Office Supplies	2,545	287	1,701	6,413	610
Technology	4,782	6,866	7,671	1,223	9,014
Grand Total	7,791	7,658	8,524	8,106	8,787

Figure.3.5.4

Figure.3.5.4 shows the top 5 most profitable customers where Tamara Chand is the most profitable customer with a total profit of **8,787**. For the customers mentioned above the most profitable category is technology except for Sanjit Chand. The sales of furniture for Raymond and Tamara have generated a loss.

4.RECOMMENDATIONS AND CONCLUSIONS

From an overall perspective the company is in a good position. Nevertheless, an in-dept analysis proves that there is room for the company to improve. Prospective recommendations have been provided below.

- Considering the shipping segment, the company must find alternative transportation modes as the shipping cost has been increasing over the years. The number of shipments shipped late must be minimized as it leads to customer discontentment. If stocks run out customers should be kept informed so that they are not kept waiting as the shipments may take longer to be shipped (late shipment).

- The discount strategy used is not efficient. For instance, the discount imposed on tables and furniture should be reduced. Moreover, Canada the market with the greatest profit to sales ratio must be given a large discount so that the profitability of the market increases, since discount has a direct relationship with sales.

- In terms of the customer retention rate the company is doing good, but the number of new customers coming in each year is decreasing.

- To increase the number of new customers the company must implement several strategies to promote their products. For example, introducing new product categories, hosting events to promote the products and inviting potential customers especially in Canada, since it is the market with the largest profit to sales ratio.

- To increase the customer retention rate, loyalty programs can be used, especially for the most profitable customers. For instance, Top profiting customers from the top 5 most profitable countries.

- Tables contribute a loss in the APAC market. Hence, the sale of tables should be made only to regions that contribute a profit such as India. With regards to the products selected in figure.3.3.4, sales to Pakistan and South Korea should be discontinued, as they contribute a loss.

- Moreover, the company must try to maximize the profitability in the home office segment by planning marketing campaigns and differentiating the products from its competitors, in order to enable the company to increase the demand for its goods.