

ST2187- BUSINESS ANALYTICS, APPLIED MODELLING AND PREDICTION COURSEWORK - REPORT

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EXECUTIVE SUMMARY

A detailed analysis of an e-commerce retailing company has been undertaken in order to extract key insights such as profits and sales to identify areas of strength and weakness. The introduction will familiarise the several variables and features of the company which are involved in the analysis. An overview of all the markets is shown which is followed by a closer look at the APAC market since it has contributed the most profit. Maximising profits and performance of products are explained in length. The Technology category has the most sales meanwhile Tables make a negative profit. Shipping costs and Order priority are compared with shipped status. The company gained fewer new customers every year so suggestions have been added to gain more customers.

INTRODUCTION

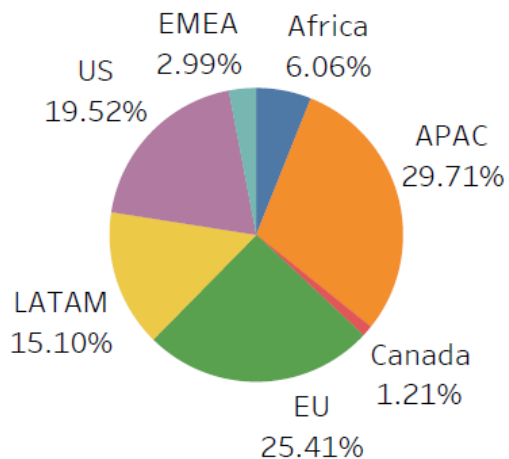
This is an analysis of a retail company that sells numerous types of items globally between the years 2018 and 2022. The analysis is divided into five primary components. Suggestions for senior management can be found at the end of each section.

Products were sold in 147 countries and 7 markets (Africa, APAC, Canada, EMEA, EU, LATAM and US). All products are offered to 3 segments which are Consumer, Corporate and Home Office. Items are divided into three categories (Furniture, Office Supplies, and Technology), which are further classified into 17 subcategories. Orders are shipped through 4 ship modes (Same day, First Class, Second Class and Standard Class) in order of fastest to slowest. Shipping costs vary depending on different order priorities: Critical, High, Medium and Low.

ANALYSIS

MARKET OVERVIEW

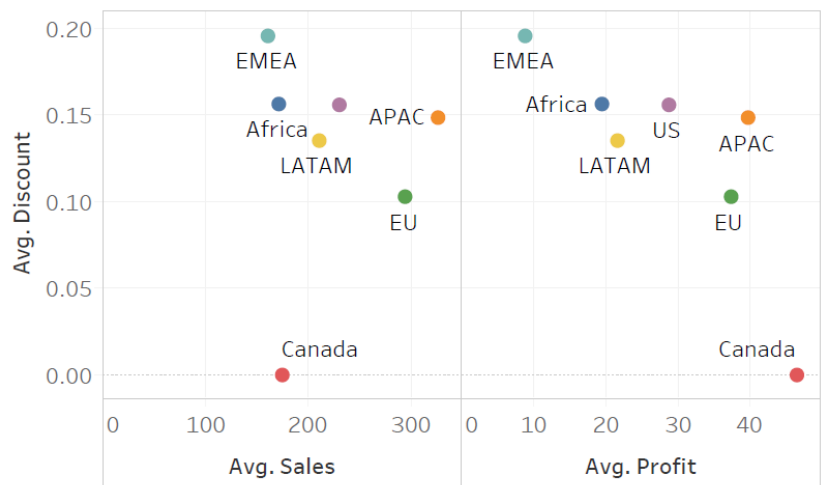
Share of profits by market



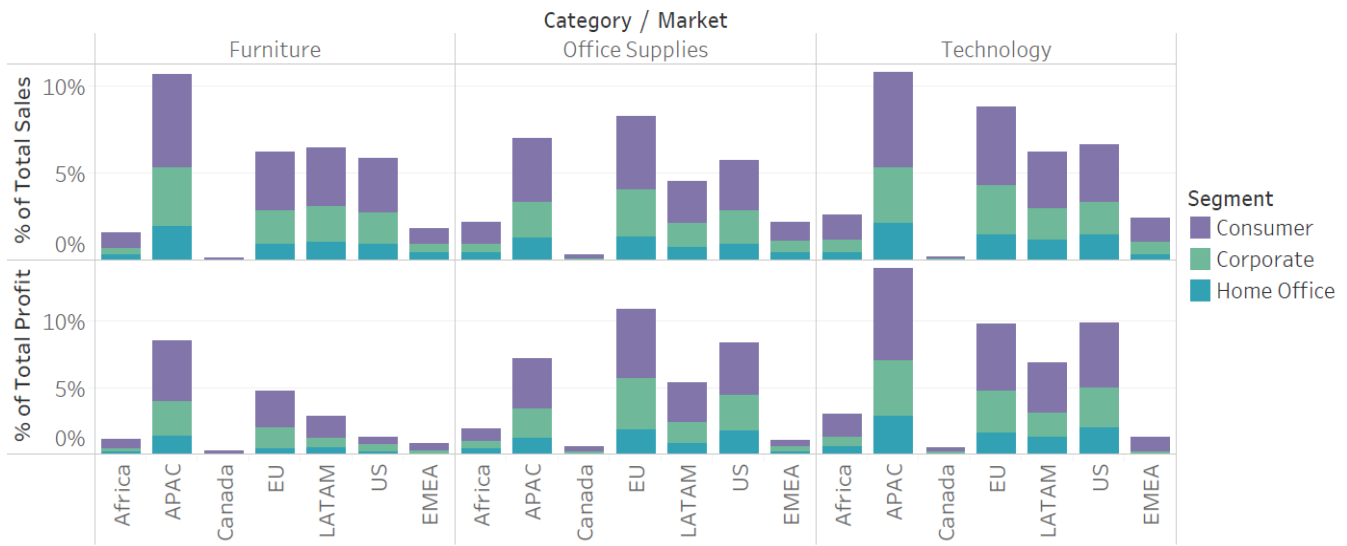
The pie chart shows the profit shares of all the markets. APAC is the highest contributor with 29.71% of shares followed by the EU with 25.41%. Canada is the least profitable market contributing only 1.21%. This may be due to heavy competition within the market.

As can be seen from the graphs on the right, it is quite obvious that the Canada market is an outlier. They provide no discounts on any of the products which is hampering their sales. But the average profit is the greatest. Excluding Canada, there seems to be a negative trend when sales and profit are compared against discounts. The EMEA market has the highest average discount (0.20%) which might have been the reason why that market has the lowest average profit (8.73%).

Sales and profit compared to Discounts



Sales and Profits by different categories



The above bar graph shows sales and profit each category for all the markets. APAC dominates the furniture and technology category whereas EU generates the most sales and profit in Office supplies.

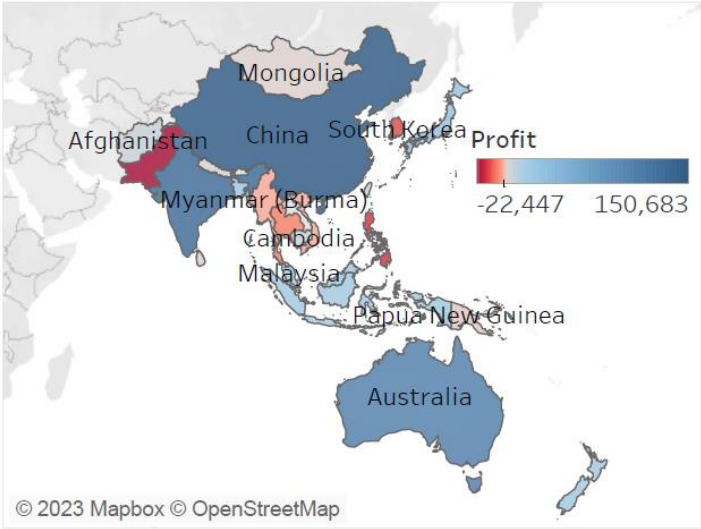
RECOMMENDATIONS :-

- Provide discounts on products sold in Canada so that customers will purchase more and boost sales.
- Markets such as Africa, Canada and EMEA should sell products at reasonable prices and implement marketing strategies to create awareness.

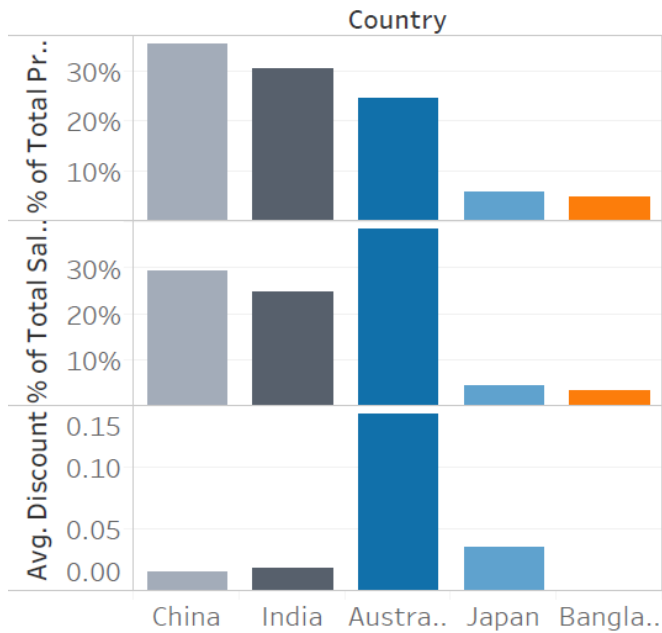
APAC MARKET DEEPDIVE

APAC is the most profitable market and the map below shows profits in each country.

Profits in APAC countries

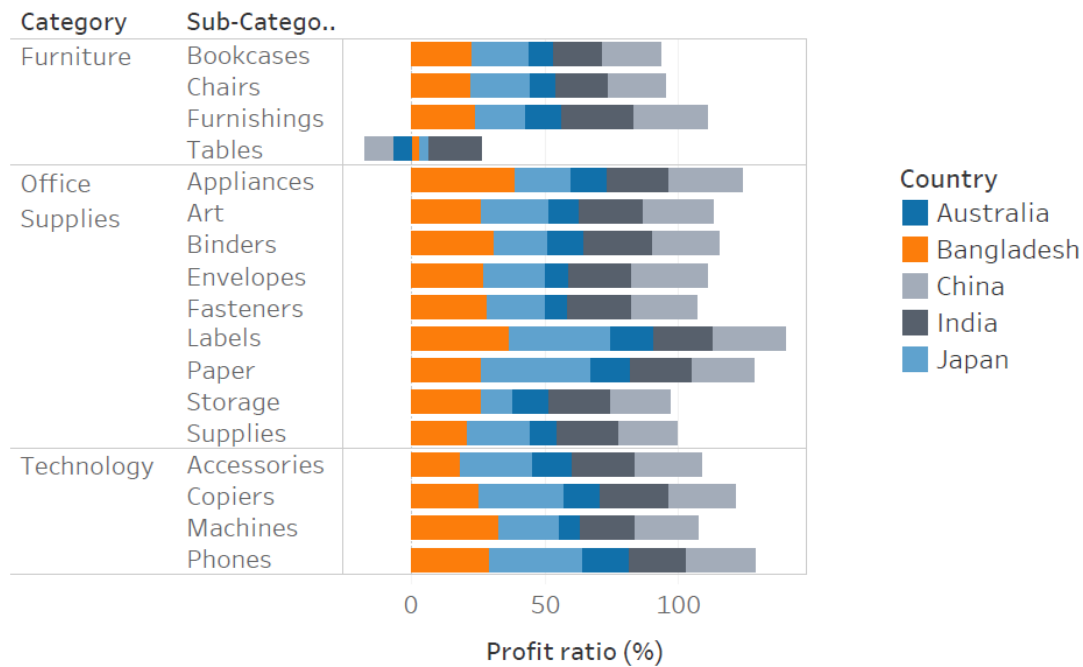


Top 5 countries' stats



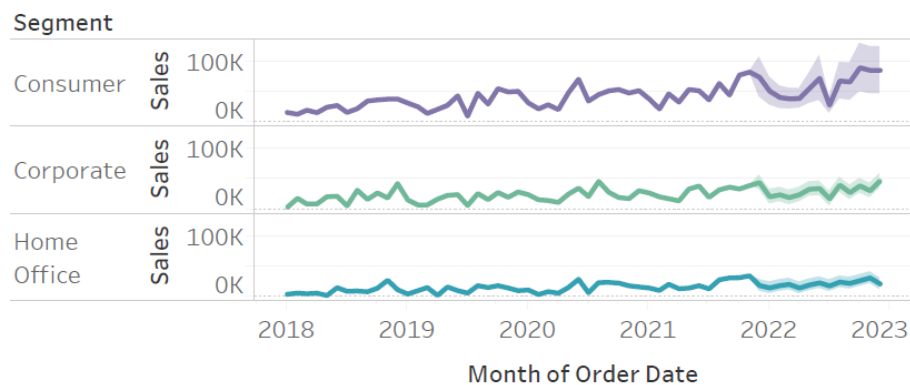
China, India, Australia, Japan and Bangladesh are the top 5 profitable countries in the APAC market. In addition to that, Australia has the most sales and provides the largest discounts. In contrast, products sold in Bangladesh have zero discount. This could be reason for their sales and profit to be so low.

Profit ratios of products in the top 5 profitable countries



When looking at profit ratios of products, Labels are on top with 140% which is closely followed by Phones, Paper and Appliances. Tables have the lowest ratio contributing only 9% and we can see that tables are the only product making a loss in Australia and China.

Future sales for each segment



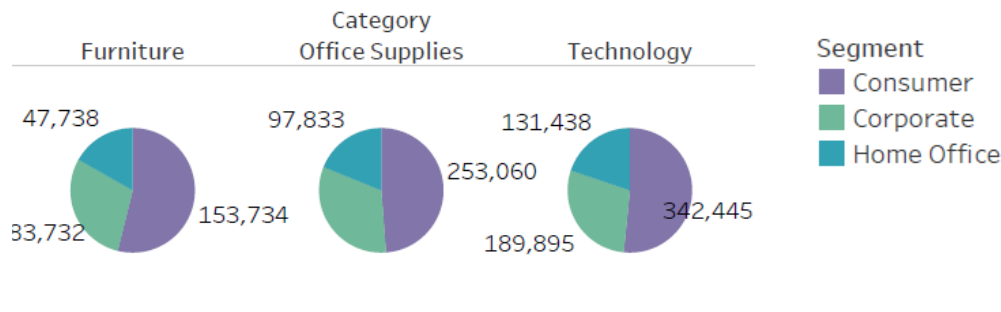
Sales of Corporate and Home Office segments seem to be in a constant state in the future. For the Consumer segment, there could a slight dip in sales in the first half of 2022 but sales are projected to rise steadily and go past the previous year's sales.

RECOMMENDATIONS :-

- To achieve more sales, discounts must be offered in Bangladesh and other low profiting countries.
- Target Corporate and Home Office customers with promotional emails and coupons to increase sales.
- Reconsider prices for Consumer segment.

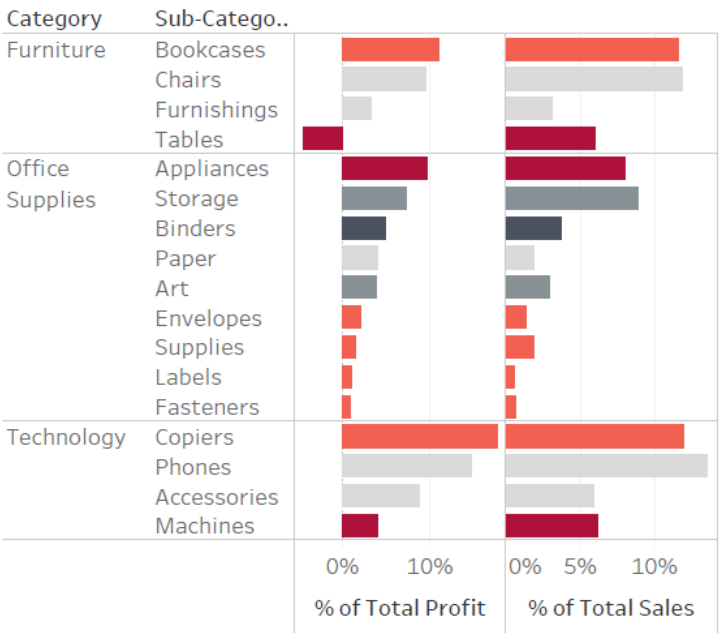
PRODUCT ANALYSIS

Category sales overview

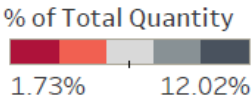


The pie charts display the totals sales for each segment under the three categories. The category with the most sales is Technology. The Consumer segment has a clear majority with approximately half of the sales in all the categories. It is followed by the Corporate and Home Office segments.

Product profitability



The bar graphs focus on % of total profit, % of total sales and % of total quantity of each sub-category. Copiers (17.62%) and Phones (13.5%) are the sub-categories with the highest profit and sales respectively. Quantity of tables sold is the lowest which has impacted their profit (-4.37%) which is also the least among all products. Furthermore, most of the Office Supplies' products are hardly profitable even though Storage and Binders are among the most sold products.

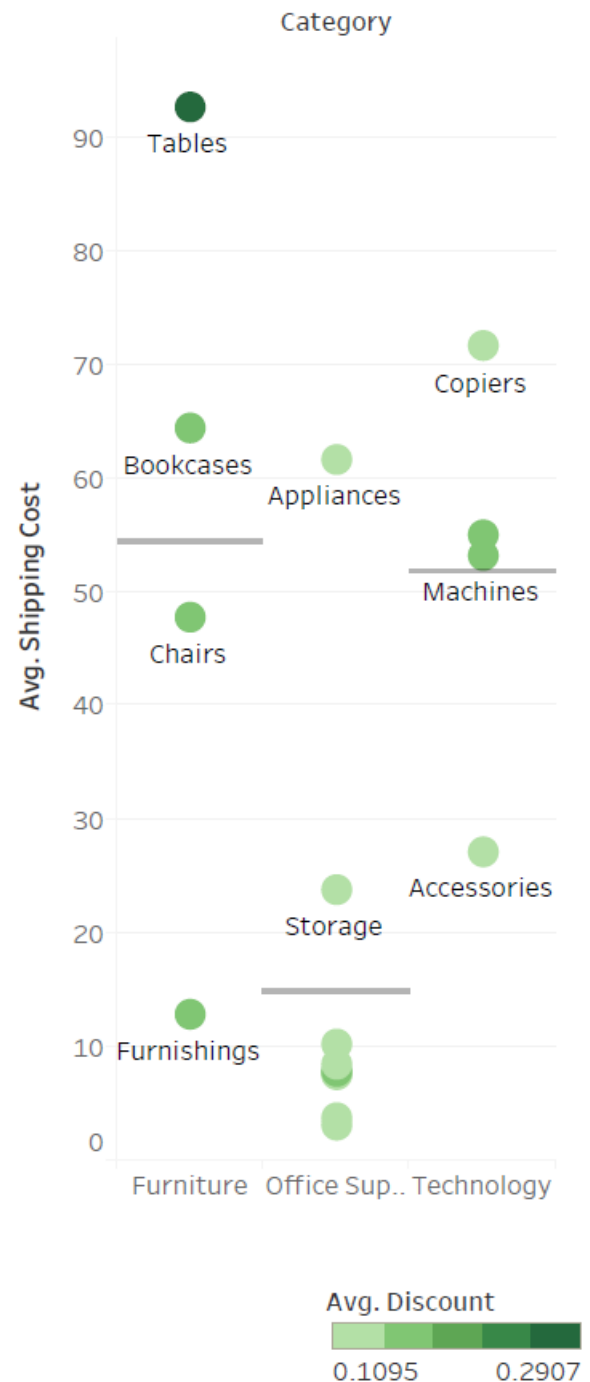


Discounts and Shipping cost for each subcategory

Now we can see if discounts and shipping cost for each subcategory is affecting profitability. The lines show the average shipping cost for each category. Tables costs the most in shipping and is the highest discounted product with 29% which is 13% more than the next product Chairs (16%). These two reasons are the primary causes as to why Tables are making a loss. Moreover, the average shipping cost of Office supplies (14.89) is much lesser than Furniture (54.48) and Technology (51.81).

RECOMMENDATIONS :-

- Since tables are making a loss, it is advisable to heavily reduce discounts and shipping costs so that tables can make more profits.
- Office Supplies' products can be bundled together and marketed as most of the products are not doing well in terms of sales and profit.
- Re-evaluate prices of products in the Office supplies category.



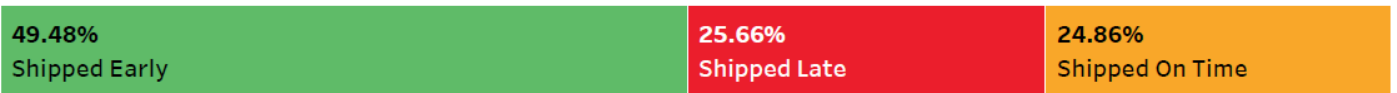
SHIPPING ANALYSIS

Quantity sold and sales per ship mode

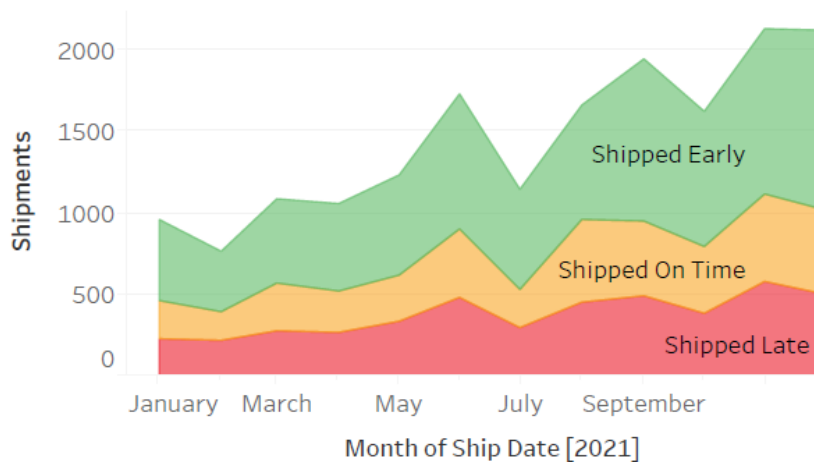
Year of S..	Ship Mode				Grand To..	Sales
	Same Day	First Class	Second Cl..	Standard ..		
2018	1,565	4,507	6,175	18,612	30,859	9,579 2,540,151
2019	1,961	5,649	7,218	23,155	37,983	
2020	2,562	6,826	9,795	29,036	48,219	
2021	3,142	8,911	12,355	35,821	60,229	
2022		146	181	695	1,022	
Grand To..	9,230	26,039	35,724	107,319	178,312	

The table above displays the quantity sold and sales according to ship mode in each year. There is a steady growth of both quantity and sales under each ship mode. Standard class is the most shipped mode while the Same day shipments is the lowest.

To analyse further, the year 2021 is taken as it has been the busiest year.

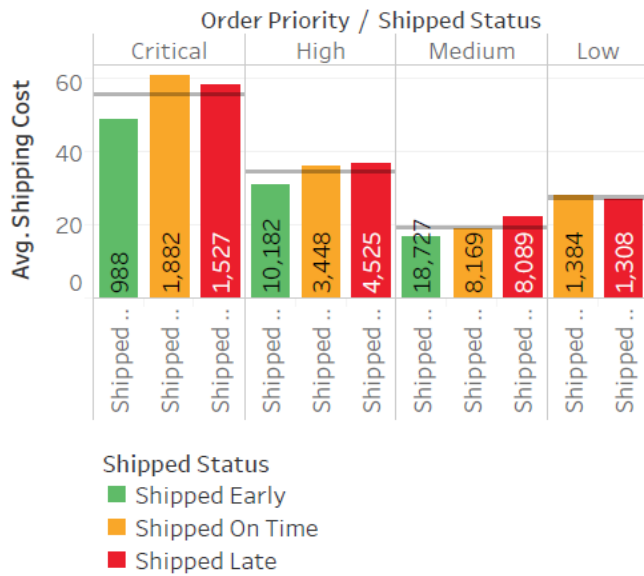


Ontime shipment trends



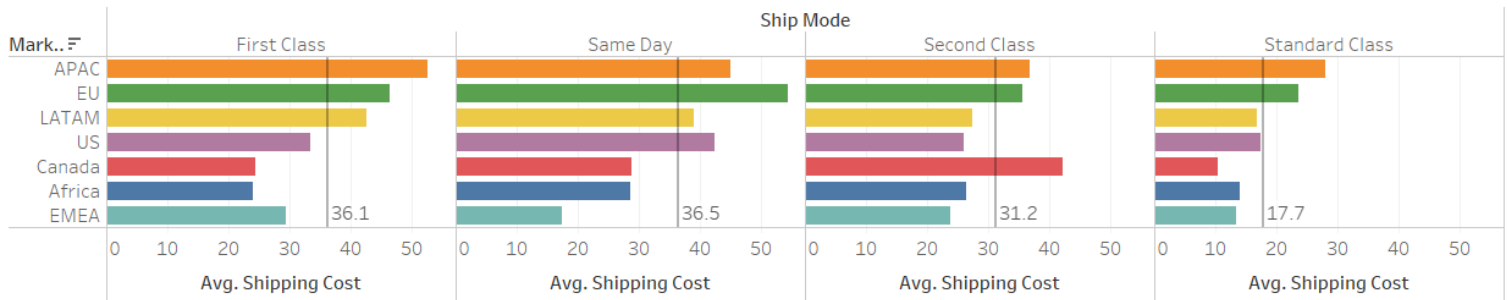
Almost half of the orders have been shipped early which is extremely good and 24.86% of orders were shipped on time. Shipments have been on the rise throughout the year. Late shipments have not increased substantially confirming that shipping time has improved.

Shipping costs vs Shipped status



Next, we compare Order priority and Shipped status with Shipping costs. The values in each bar indicate the quantity sold and the lines shows the average. As expected, Critical priority orders are the costliest with an average of 56.20 followed by High priority. An interesting observation is that the shipping cost of Low priority orders is greater than that of Medium which is unusual. It is also noticeable that costs are lower if there are no delays in shipments.

Shipping costs due to different modes

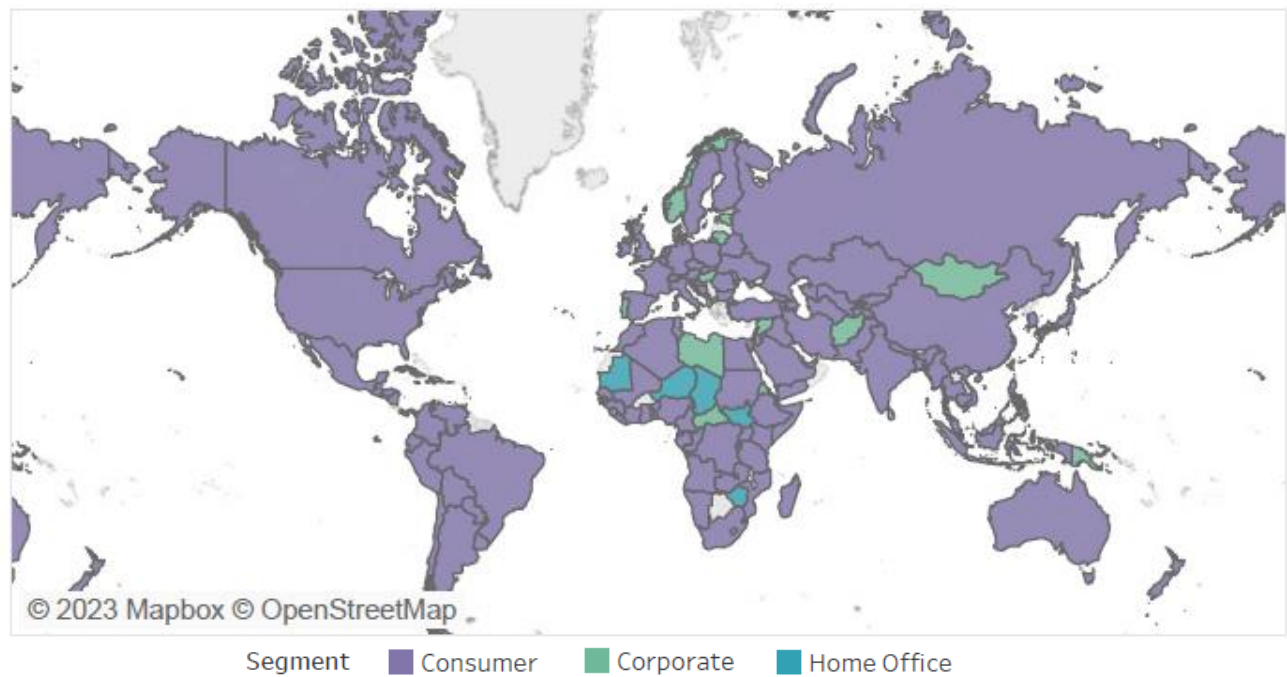


Here the lines display the average shipping cost for each ship mode. APAC market has the highest average shipping cost in all ship modes except Same day where the EU is the first.

RECOMMENDATIONS :-

- Shipping cost for Critical Order priority goods should be reduced by finding cheaper distribution partners, to increase total sales.
- Number of late shipments can be reduced further so that customers do not switch to competitors.
- Customers should be notified if their order not dispatched on time.
- Majority of the orders fall under Medium priority, therefore shipping costs can be increased to gain more profit.

Which segment has the most sales?



Consumer segment leads the sales in most of the countries. Few central African countries are dominated by the Home Office segment.

Existing and new customers count

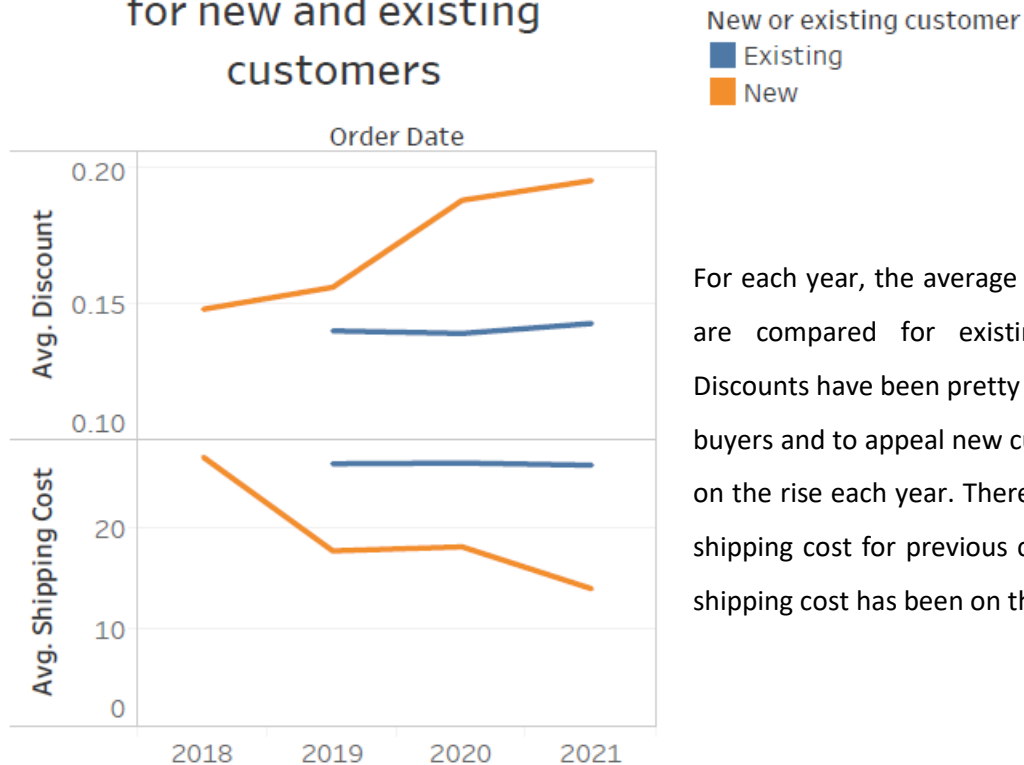
		Order Date			
		2018	2019	2020	2021
Existing			1,163	1,401	1,496
New		1,309	209	57	15

Distinct count of Customers

15 1,496

Customer retention is decent due to the increase in number of customers who purchase again. A concern is that the count of new buyers is decreasing overtime.

Discounts and shipping costs for new and existing customers



For each year, the average discount and shipping cost are compared for existing and new customers. Discounts have been pretty much the same for existing buyers and to appeal new customers, offers have been on the rise each year. There seems to be no change in shipping cost for previous customers but new buyers' shipping cost has been on the decline.

RECOMMENDATIONS :-

- To ensure that past and new customers will buy again from us, we can provide them with loyalty cards or send promotional emails.
- To improve new customer gains each year, give adequate training for the marketing team or hire young trained marketing workers to promote the company's brand image worldwide through social media.
- Provide discounts on Consumer and Home Office segments to boost sales.
- To expand the customer base, the website should be maintained well and update regularly with the latest features.

CONCLUSION

To improve sales and gain more profits, key discoveries and suggestions to issues are listed below.

- The Canada market performed the worst in terms of profits since no discounts were provided on products. This led to a reduction of sales. Therefore, discounts should be offered to customers to boost sales.
- Technology has the most sales.
- Copiers brought in the most profit while Phones generated the most sales.
- Tables are the only sub-category which are not profitable. Cut shipping costs and discounts.
- Low priority orders costs more to ship than Medium priority orders where most orders fall into.
- Consumer segment has the most sales in majority of the countries.
- Offer special discounts for Corporate and Home Office segments to enhance sales.
- Number of new customers were on the decline every year. Employ individuals specialised in digital marketing to increase new customers.
- Send regular promotional emails or text messages to customers to increase traffic to the website.