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THE LONDON SCHOOL
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ST2187 Business analytics, applied modeling and prediction.

Coursework Assessment - 2024

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Executive Summary

This report presents an in-depth assessment of a retail company dataset to generate practical insights to improve and optimize company operations. The dataset given contains a variety of characteristics in dimensions, geographical factors, and different measures that affect the overall business performance. Additionally, this in-depth assessment is divided into five major sections as follows:

- ❖ Top 3 Markets Performance and Forecasts Analysis.
- ❖ US Market Analysis
- ❖ Shipping Analysis
- ❖ Categorical Analysis
- ❖ Customer Segment Analysis

Based on these five major sections, the company can follow the recommendations provided according to the conclusions in the report, to enhance the overall business performance. Moreover, acting on these recommendations can improve customer satisfaction and sustain the growth of the organization in the future.

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1. Introduction:

The dataset contains details about a retail company that sells furniture, technology, and office supplies to three types of customers (Consumer, Corporate, and Home Office) between 2019 and 2022. The sales cover 147 countries and 7 markets, with shipments managed through four shipping modes and order priorities.

The Distinct Count of 'Order ID' and 'Customer ID' is used to identify the number of orders and the number of customers of the business distinctly. These are the additional calculated fields of measures created to aid some observations;

1. Measure name – Ship Status:

```
IF [Ship Date] - [Order Date] = 0 THEN "Early"  
ELSEIF [Ship Date] - [Order Date] > 0  
    AND [Ship Date] - [Order Date] <= 3 THEN "On-Time"  
ELSE "late"  
END
```

2. Measure value – Cost:

```
SUM([Sales]) - SUM([Profit])
```

3. Measure Value - New Customer:

```
IF {FIXED [Customer ID] : MIN([Order Date])} = [Order Date]  
    THEN 1  
ELSE 0  
END
```

2. Observations:

2.1. Top 3 Market Performance and Forecasts:

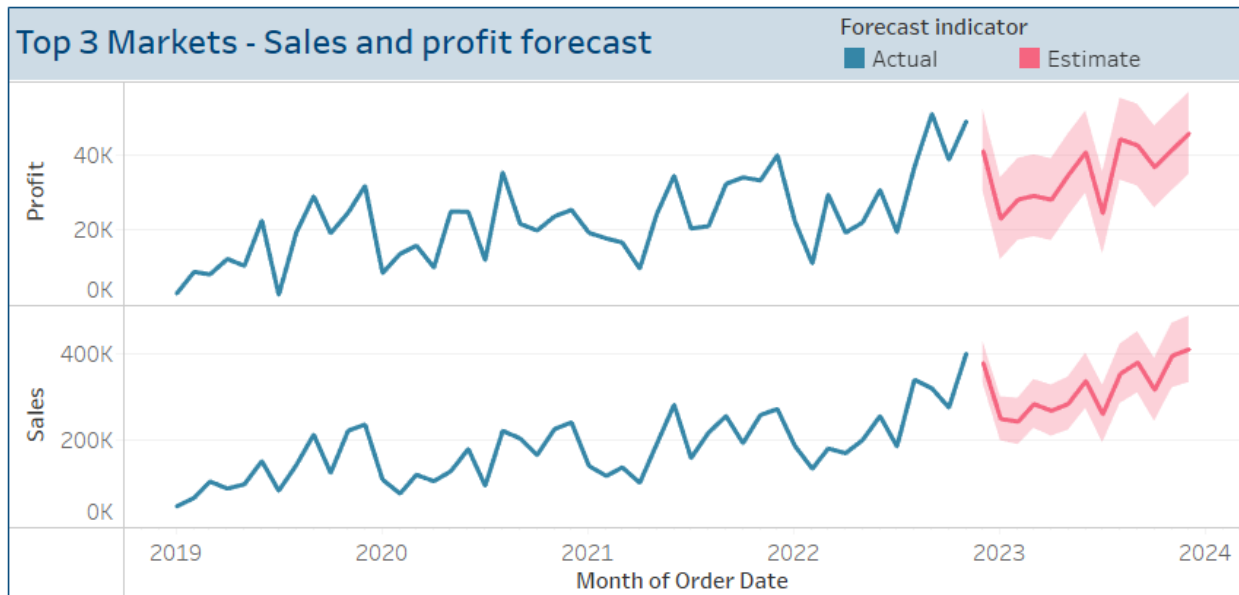


Figure 1

The forecast for the top 3 profiting Markets, shows a noticeable seasonal pattern throughout for both profits and sales which peaks around September to December and drops around July at the beginning of the year. Additionally, there is a significant shift in profits accounting for a \$5682 change from December 2021 to December 2023 and similarly, sales experience a change of 137,157 from December 2021 to December 2023, as estimated.

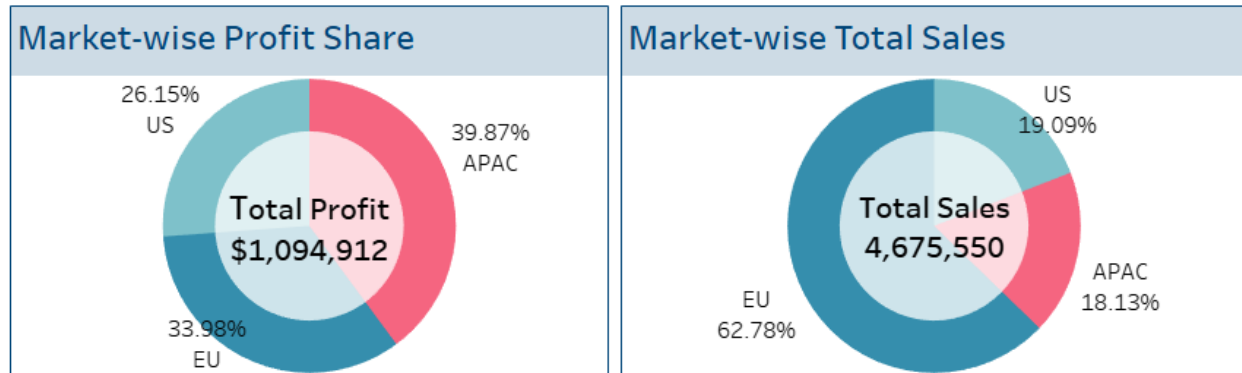


Figure 2

Out of the seven Markets, APAC, EU, and the US are the top three profitable markets with a total profit of \$1,094,912 which is mostly contributed by the APAC Market. However, the majority of the sales for the top 3 markets are contributed by the EU Market.

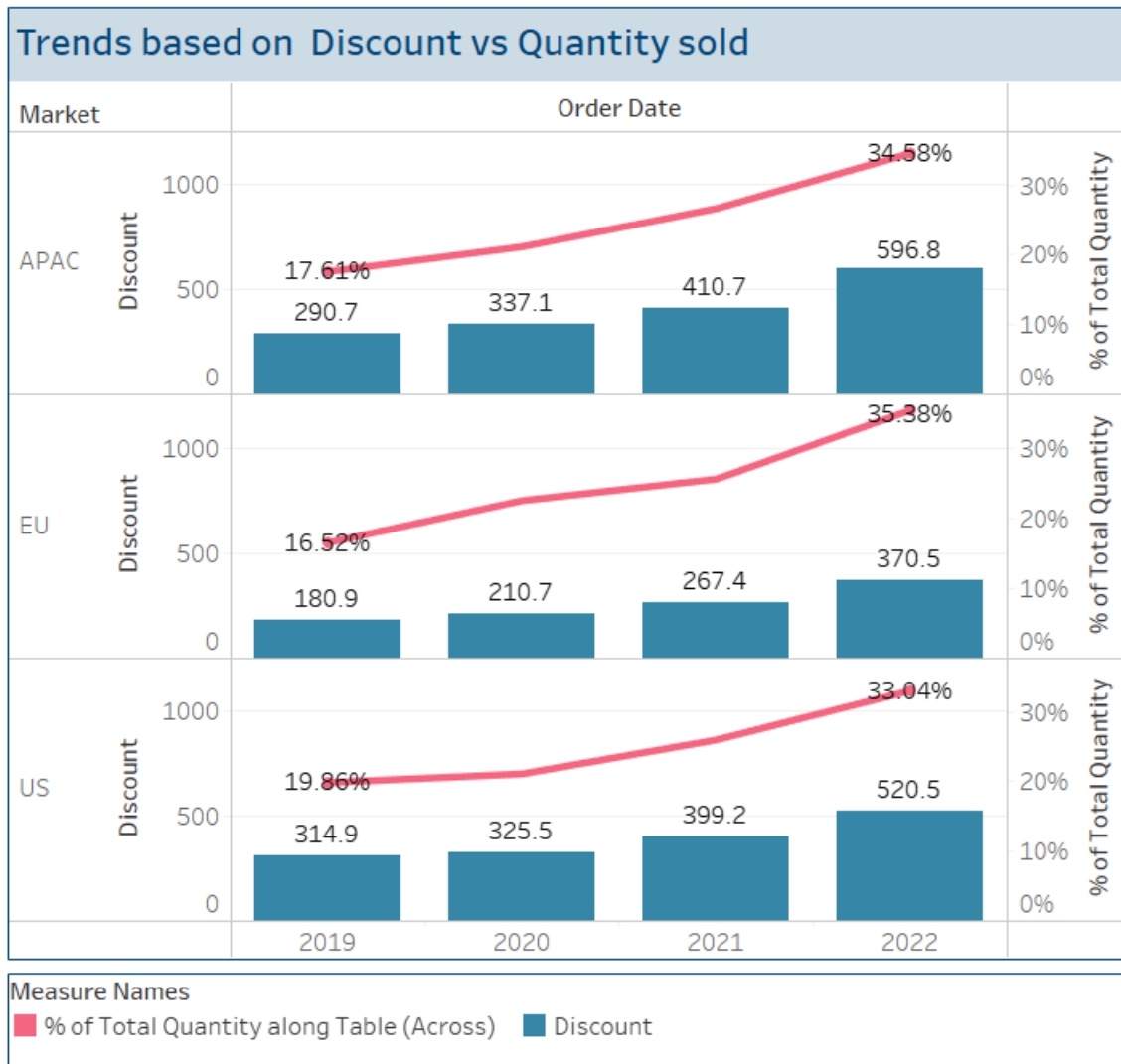


Figure 3

EU Market has the lowest average discounts but has the highest sales and quantity sold. The high sales even with lower discounts can show the demand for products and customers possibly buying in bulk due to factors like perceived value, convenience, or necessity. Although profit margins may be reduced, potentially because of competitive pricing or operational costs, the considerable revenue generated from high sales volume compensates for this, making the market feasible and the 2nd highest profitable market.

2.2. US Market Analysis:

As mentioned above since the US market is one of the highest sources of profitability for the business, a further independent analysis will be provided.

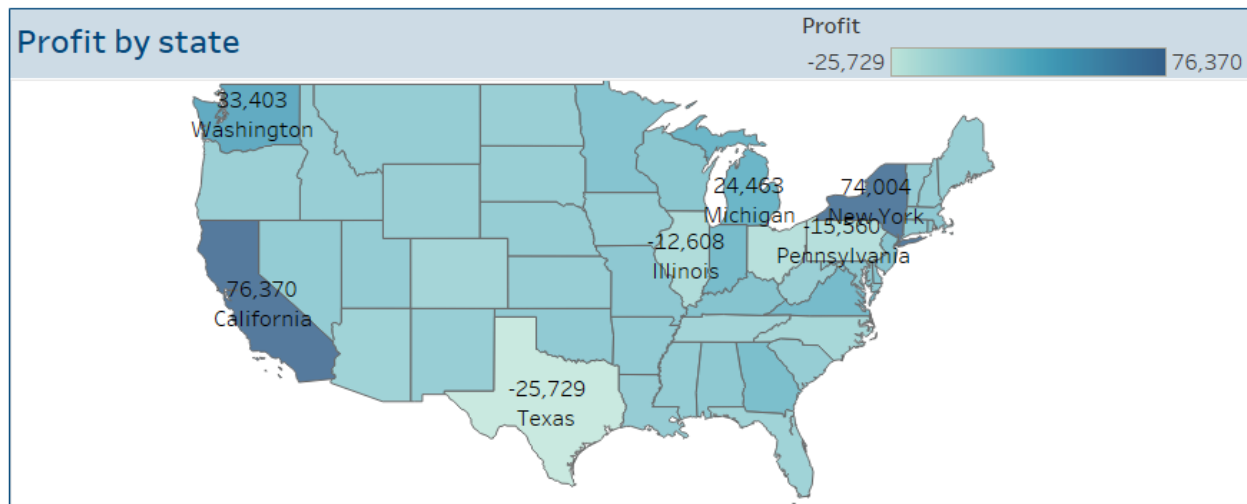


Figure 4

This map shows that California is the most profitable state (\$76,370) and the highest loss-making state is Texas (-\$25,729).

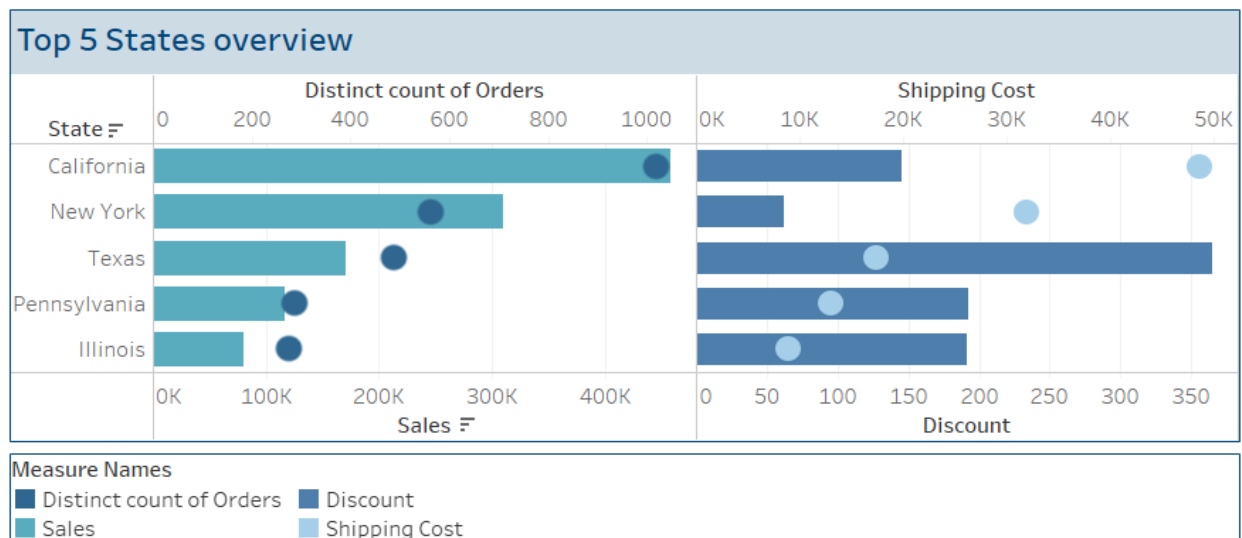


Figure 5

Figure 5 illustrates that Texas ranks 3rd highest in both sales and number of orders despite experiencing the greatest loss among all states within the US market. This loss may be attributed to Texas offering the highest discounts (364.6) while also encountering the 3rd highest shipping cost (\$17,346).

Further analyzing the massive loss in Texas, the below chart shows the sum of profit and discount for each sub-category with percentage discount labels in the state of Texas.

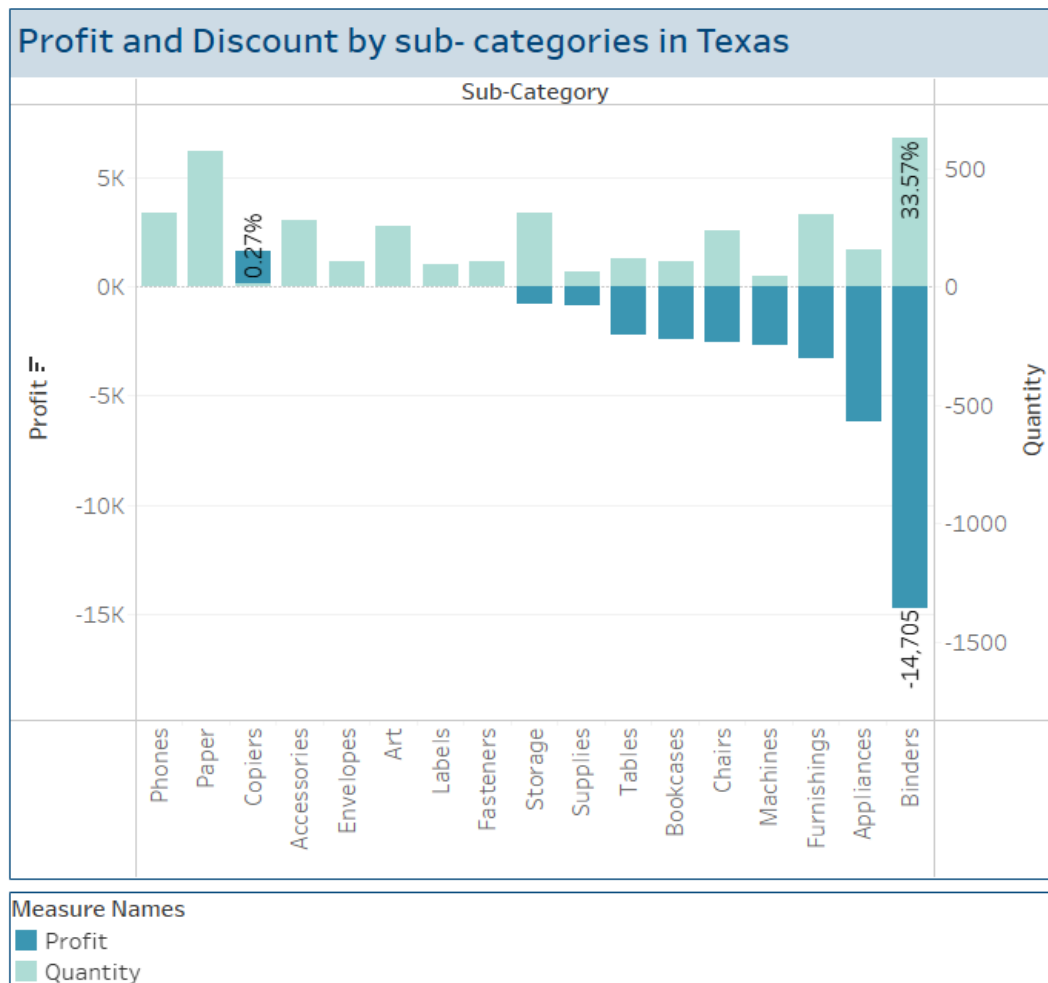


Figure 6

It can be observed that Binders is causing the greatest loss even with a significant demand of 626 units sold because of the extremely high discount percentage of 33.6%. Copiers, which ranked third in terms of profitability in Texas, received the lowest overall discount (0.26%). This highlights that offering higher discounts could also raise the risk of experiencing losses.

2.3. Shipping analysis:

Measure Names

■ Avg. Shipping Cost

■ Distinct count of Customer ID

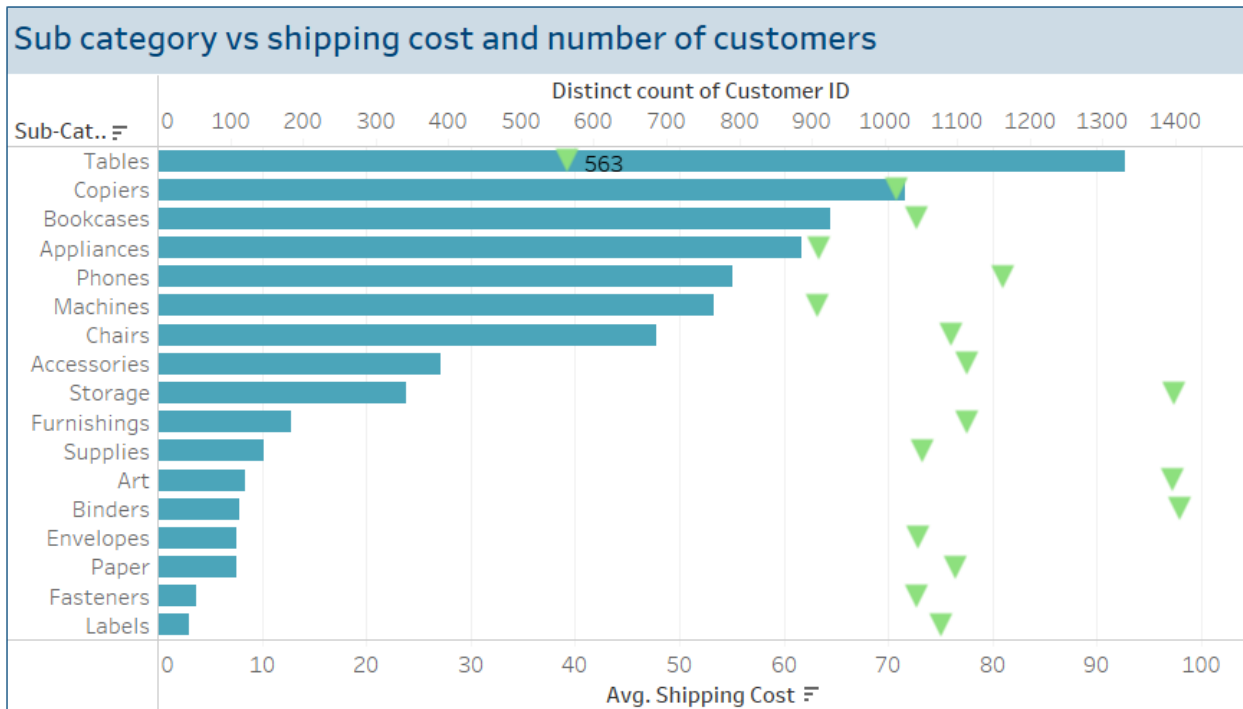
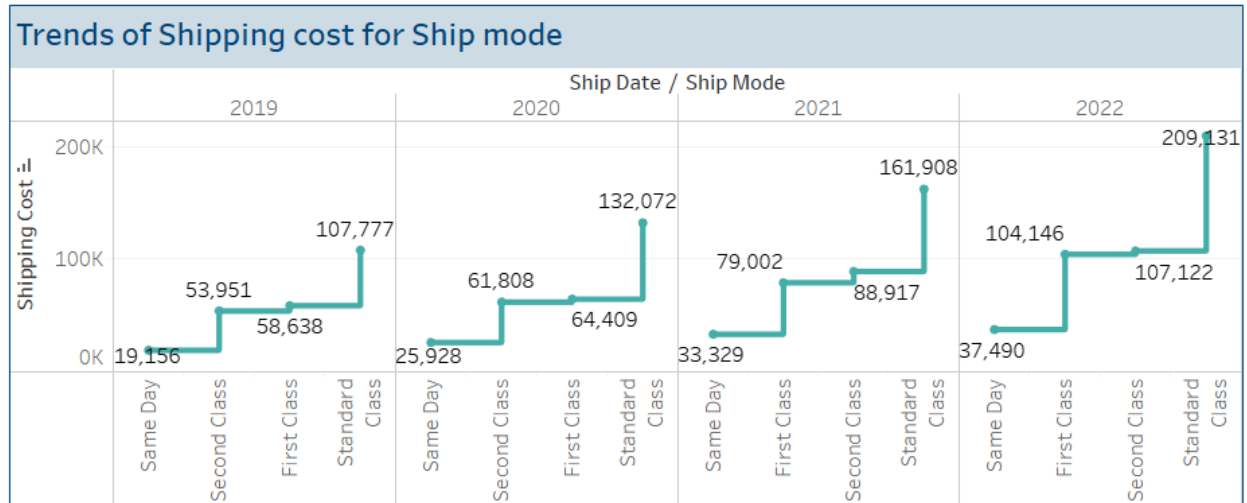
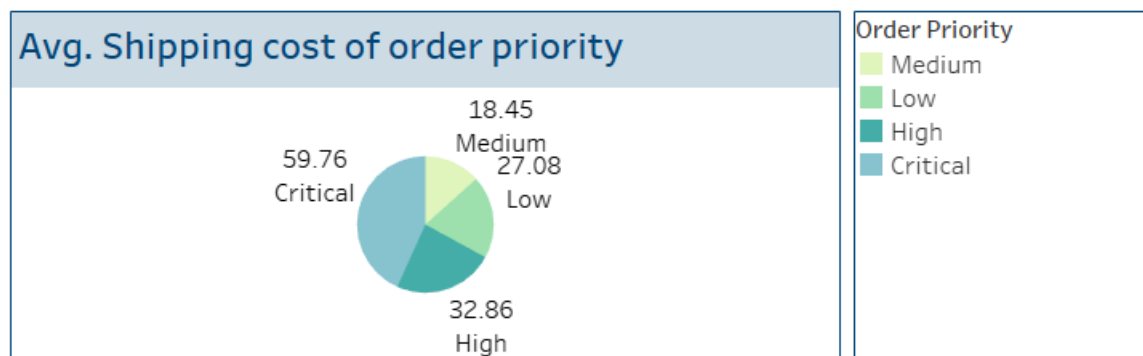


Figure 7

This chart shows that the shipping costs for sub-categories namely, tables, copiers, bookcases, machines, and appliances are significantly higher. The tables sub-category has an extremely low number of customers which could be due to its skyrocketing shipping cost compared to other subcategories.

**Figure 8**

The shipping costs for various modes have been consistently increasing over the years, with standard class showing a particularly steep rise. For the standard class from 2019 to 2020, there was an increase in shipping by \$24,295, followed by another increase of \$29,836 from 2020 to 2021, and a further \$47,223 increase from 2021 to 2022. This upward trend in shipping costs can severely affect profitability and sales, since greater shipping charges may result in increased product pricing, thus discouraging customers from making purchases.

**Figure 9**

The graph demonstrates Critical priority orders have the highest average shipping cost, although low-priority orders have a higher average shipping cost than medium-priority orders. Typically, faster shipments result in greater expenses. As a result, the corporation must determine why low-priority orders are more expensive than anticipated.

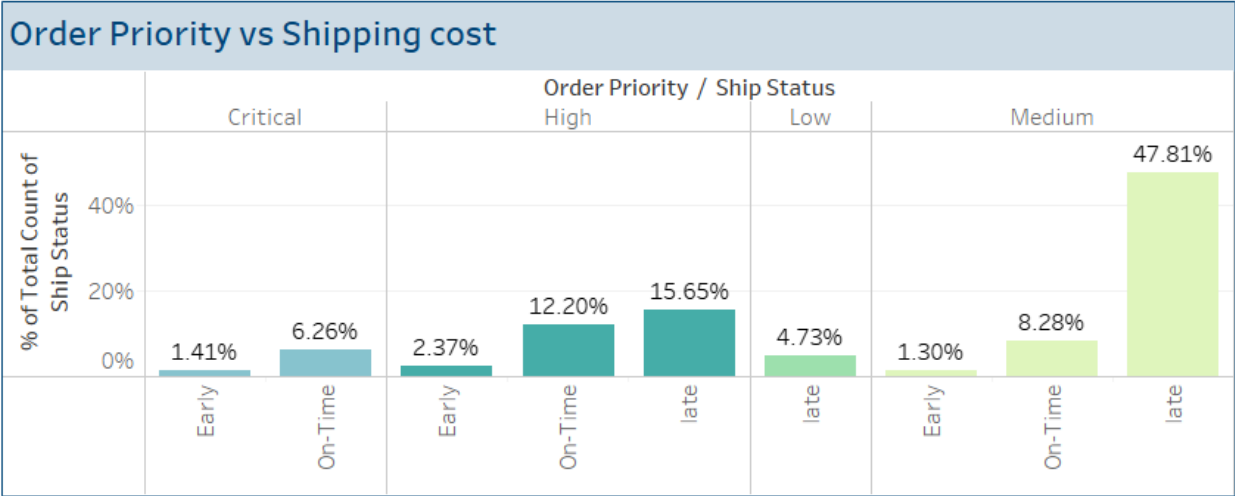


Figure 10

An in-depth analysis of order priorities highlights that all the low-order priorities and 15.65% of all High order priorities were shipped late. Also, a detrimental rate of 47.81% of all medium priority orders was shipped late, resulting in further customer discontentment indicating a much-needed improvement in the logistics operations of the company.

2.4. Categorical Analysis:

Order count for each Category



Figure 11

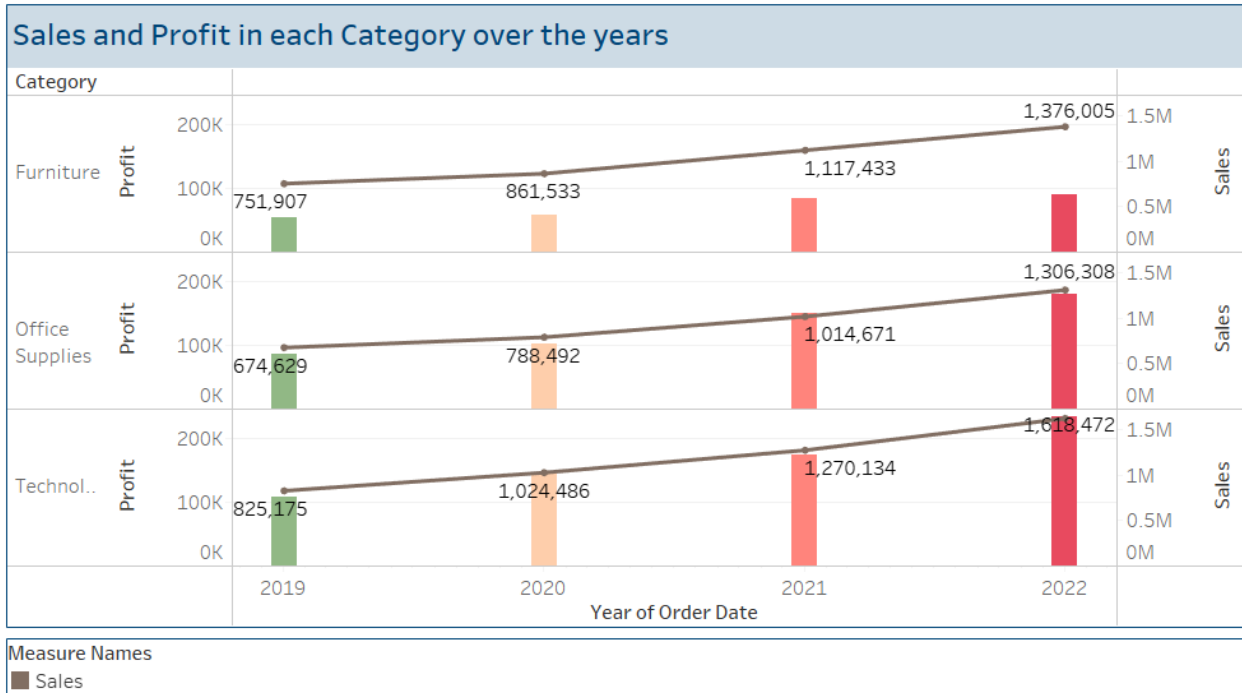


Figure 12

This figure shows that the majority of the company's profits and sales are contributed by the 'Technology' category. The 'Office supplies' category generates the highest number of orders (figure 11) and more profit than the 'Furniture' category but has made the least number of sales overall.

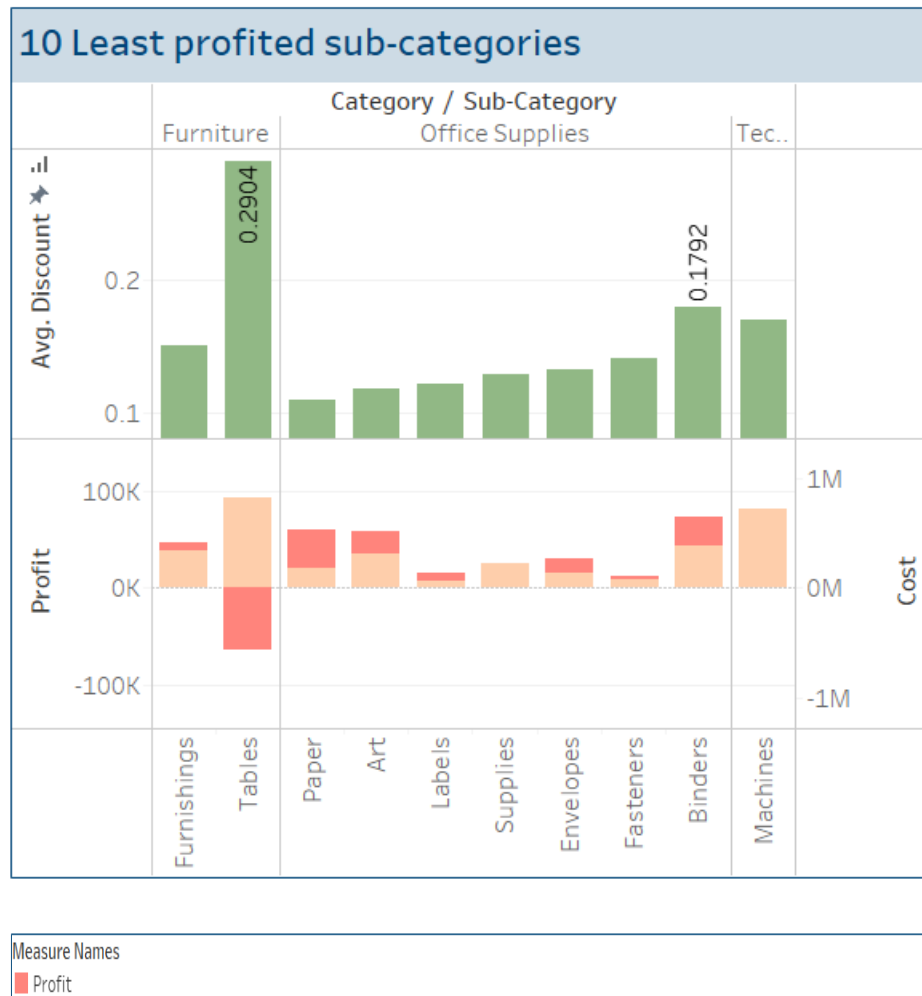


Figure 13

Diving deeper into the analysis of the 10 least profit-making subcategories, the Tables sub-category is making a significant loss given its heavy discounting. However, it is also shown that more least profiting sub-categories (7 out of 10 sub-categories) are from Office Supplies. Hence, increasing sales in the Office supplies category can be favorable for the company.

2.5. Customer-Segment Analysis:

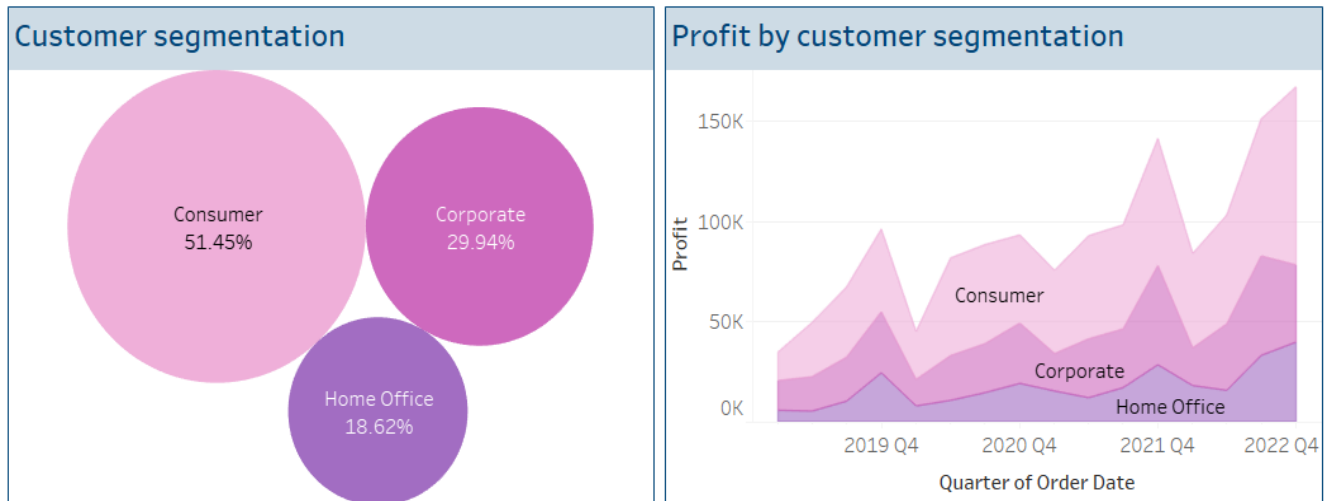


Figure 14

According to the diagram, the consumer segment has the highest profit which could be due to its large customer base of 51.45% out of the company's total customers.

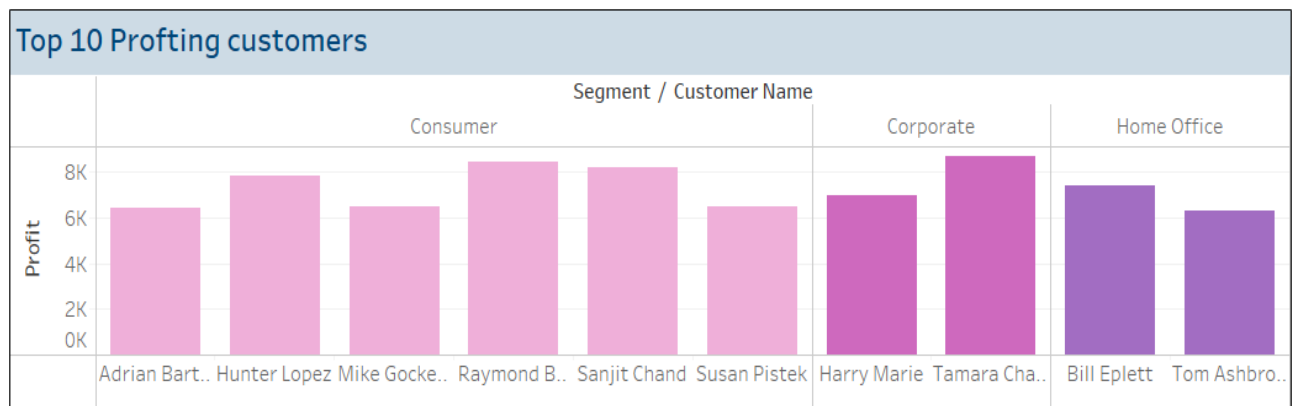


Figure 15

Additionally, out of the Top 10 Profitable customers of the organization, 6 customers are from the consumer segment. This may indicate that the firm should prioritize serving products to the consumer sector to increase profitability.

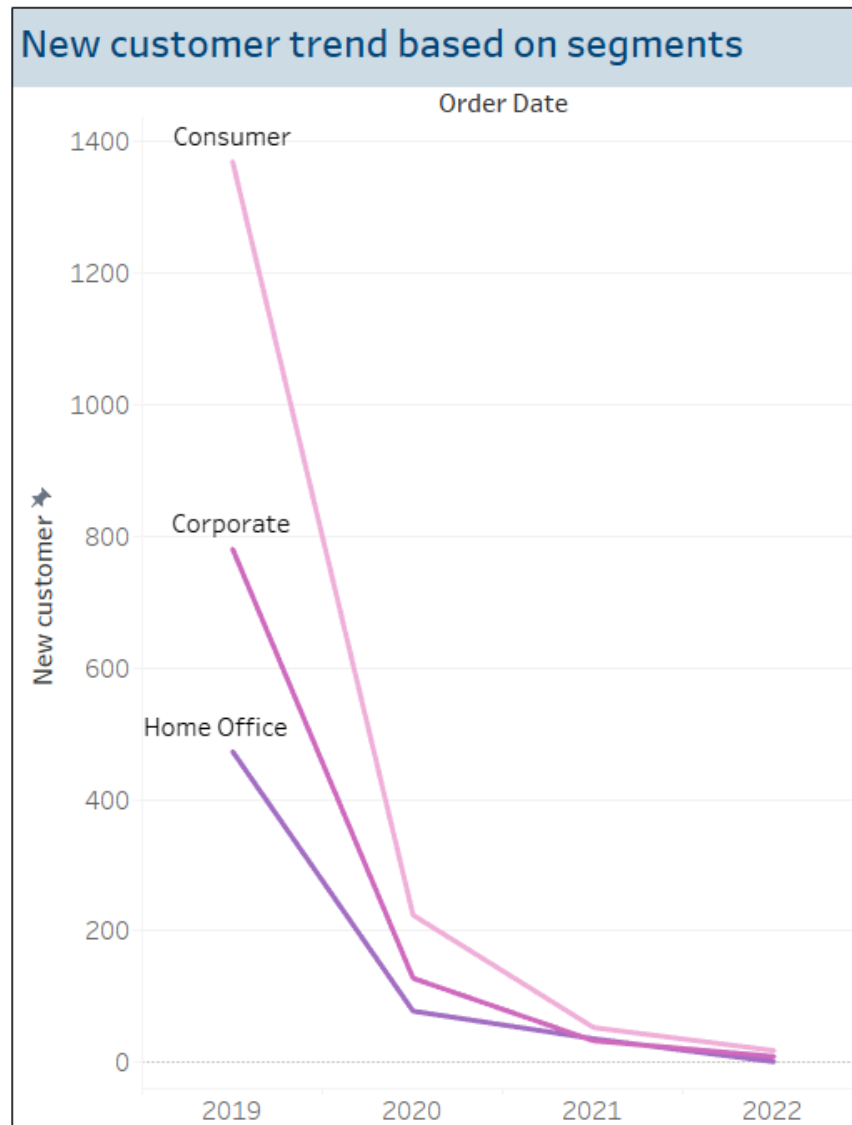


Figure 16

This chart shows that the company is performing poorly in attaining new customers throughout the years especially from 2021 to 2022.

3. Recommendations and Conclusions:

Based on the conclusions drawn from this report listed below (in bold), several recommendations can be made to enhance overall business performance.

- **Seasonal factors affect sales and profit of the business each year:** In peak seasons towards the end of the year, companies can encourage customers to buy during high demand by offering time-limited discounts, special offers, or packaged bundles. Conversely in low seasons, expanding product variety, experimenting with new distribution methods, and focusing on customer loyalty programs and customized mailings can assist in attracting diverse consumer segments and develop long-term relationships.
- **APAC, EU, US, Technology, and Consumer are high-profiting markets, categories, and segments respectively:** Additional focus and investing more resources to tailor strategies to better serve them would be valuable.
- **Texas is the highest loss-making state in the US Market:** consider raising selling prices of Binders, especially in Texas where Binders have resulted in significant losses despite high sales. Alternatively, even ceasing Binder sales in Texas may mitigate the losses, as it shows limited growth potential. Further investigating the reasons behind offering higher discounts specifically for Binders in Texas, compared to other states, is beneficial to refine the pricing strategy.
- **Copiers have a greater potential for growth in Texas:** by giving higher discounts and developing strong advertising campaigns, especially targeting the US market to benefit from its high profitability within the Sub Category. Also, by driving up sales volume, greater profitability for Copiers can be achieved.
- **Tables subcategory makes a significant loss:** due to significant discounting and higher average shipping costs as Tables weigh more. Hence, the company could resort to pick-up locations instead of delivery, which would be more cost-effective since they would only have to cover a fixed rental fee.

- **Low Order priority shipping cost is higher than medium:** as a result, future sales may decrease. To solve this, consider packaging materials and practices that minimize parcel size and weight for low-priority orders. Compact and lightweight items are typically much better for reduced delivery fees.
- **Low sales of Office supplies:** Implementing a system that allows businesses to donate extra office supplies to educational institutions, charitable organizations, or local communities, to showcase their support for social obligation. Furthermore, establishing an 'Office supplies interaction studio' which is a physical space where customers can involve themselves in the brand experience, interact with certain office supply products, and give real-time feedback
- **The current discount strategy is not that efficient:** Send out tailored discounts to shoppers who abandon their online shopping carts and modify prices according to current market demand or available inventory in real-time.
- **Shipping cost for Standard Class increases drastically throughout the years:** Deploy multi-carrier shipping software via outsourcing partners to effectively examine prices and choose the most cost-effective shipping ways instantaneously.
- **Late shipments affect customer satisfaction:** The corporation needs to minimize late shipments from an average of 3 days to fewer days.
- **Appalling the number of new customers over the years:** Create programs or offers in which current clients are motivated to refer new consumers to the company, thereby elevating customer referrals.

END.