

# **Business Analysis Report**



**Module code- ST2187**

**Module Title – Business Analytics, Applied Modelling and Prediction**

**UOL Student Number- 220627669**

**Word Count: 1498 (Excluding Executive Summary and Table of Contents)**

## Executive Summary

This report presents an in-depth analysis of an online retail company, with a wide customer base that spans across the globe. An overview of the business indicates that it is doing well, with a consistent rise in revenue and profits and a loyal clientele.

The purpose of this study is to uncover patterns and market trends, as well as valuable insights that could provide a better understanding of the customers' requirements. Hence, by thoroughly analysing the provided dataset, the company's tactical decisions can be altered to optimize sales revenue and profits, while also reducing additional expenses in the future.

The conducted analysis focuses on the following key factors:

- ❖ An overview of the company across all markets, in terms of sales and profits.
- ❖ Product breakdown based on their categories and their individual performance.
- ❖ Analysis of new customer acquisition, sales forecasts and top customers.
- ❖ Investigation into the efficiency of shipments and shipping costs, with respect to ship modes and order priorities.
- ❖ Examination of the APAC market based on the regions in APAC and the most profitable countries.

Predictive and descriptive statistical analyses have been employed throughout the process in order to forecast and examine key performance metrics.

Recommendations have been made at the conclusion of the report to maintain current standards or raise performance levels, as well as to minimize inefficiency and losses.

## Table of Contents

<b>Executive Summary.....</b>	<b>1</b>
<b>Section 1 – Introduction.....</b>	<b>3</b>
<b>Section 2 – Analysis and Key Findings.....</b>	<b>4</b>
2.1- Overall Market Analysis .....	4
2.2- Product Analysis .....	7
2.3- Customer Analysis .....	11
2.4- Shipping Analysis .....	14
2.5- APAC Market Analysis .....	18
<b>Section 3 – Recommendations and Conclusion.....</b>	<b>21</b>

# Introduction

This report discusses how the company caters to consumers in 147 countries around the world, through an e-commerce market.

Over a span of four years (2019-2022), it sold Technology, Furniture and Office Supplies to three types of customers. The customers are able to choose from four different shipping modes and priority levels, with varying shipping fees based on the selected shipping details and customers' region.

## **Assumptions used for the analysis:**

- ❖ To analyse trends over the years and generate forecasts, the “Order Date” variable from the dataset has been used.
- ❖ “Customer ID” variable was used to distinguish between the new and repeated customers in the market.
- ❖ In order to analyse the efficiency of shipments, suppose that:

Ship mode	Estimated number of days to ship
Same day	0
First Class	2
Second Class	3
Standard Class	5

The order is considered “Late” if the actual shipping time exceeds the estimated days to ship, “Early” if it was less than the estimated days to ship, and “Shipped on time” if the shipping time is same as the estimated days to ship.

# Analysis and Key Findings

## (2.1) Market Analysis

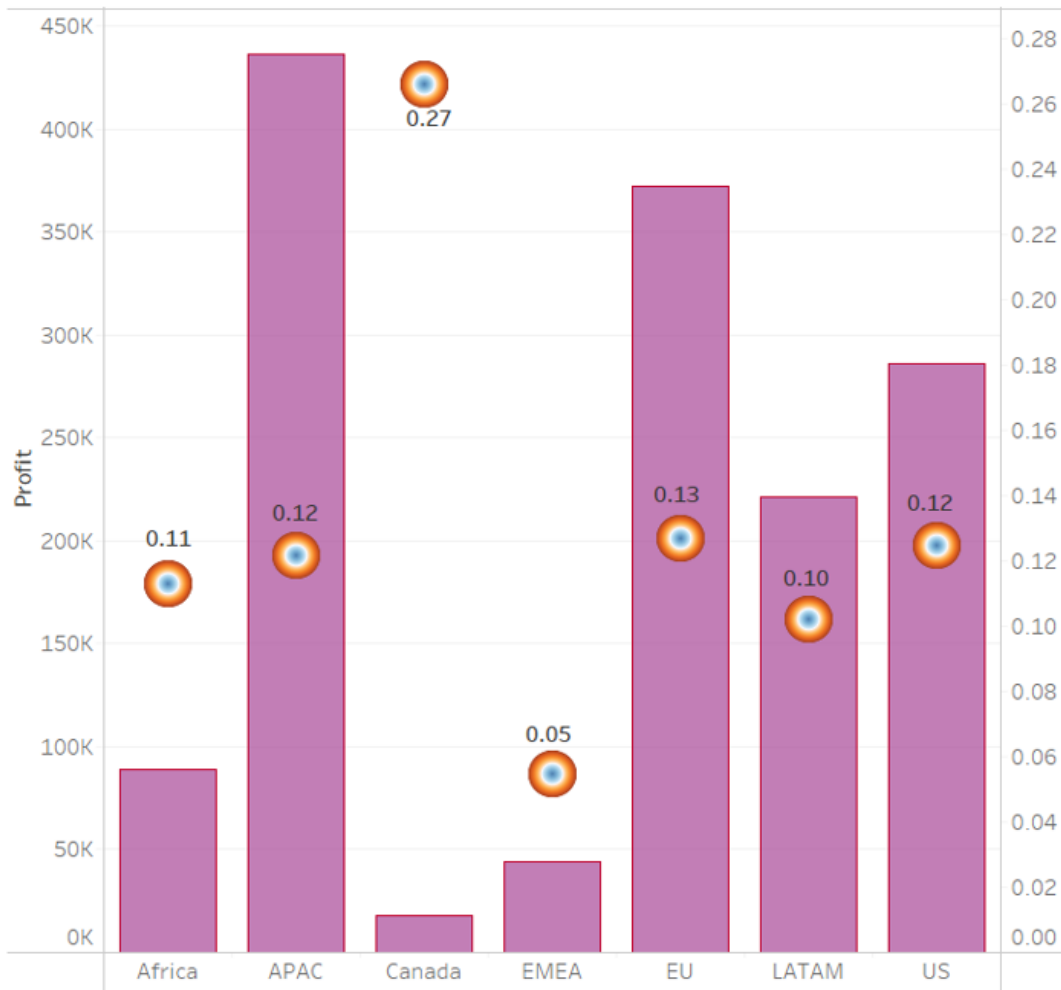
Figure 01- Overall Analysis on the Market



- APAC has the most customers and others follow with a similar customer base. Canada is an outlier with only 181 customers, making it the lowest sales accounted market.
- Some patterns can be observed:
  - Markets with high sales/strong profit margins such as APAC have the highest shipping costs.

-Low profit markets such as EMEA and Africa offered the biggest discounts. (Except Canada, which gives zero discounts.

Figure 02: Profit vs Profit/Sales ratios of Markets



- APAC dominates with the highest profits and sales, but its profit/sales ratio is only 0.12.
- EU has the second highest profits and sales, with a higher profit ratio of 0.13 due to smaller discounts.
- Canada generates the lowest profits, making it the worst performing market. But it has the largest profit ratio of 0.27 which indicates high potential for business growth.
- EMEA has the lowest profit ratio of only 0.05, as it provides the largest overall discounts.



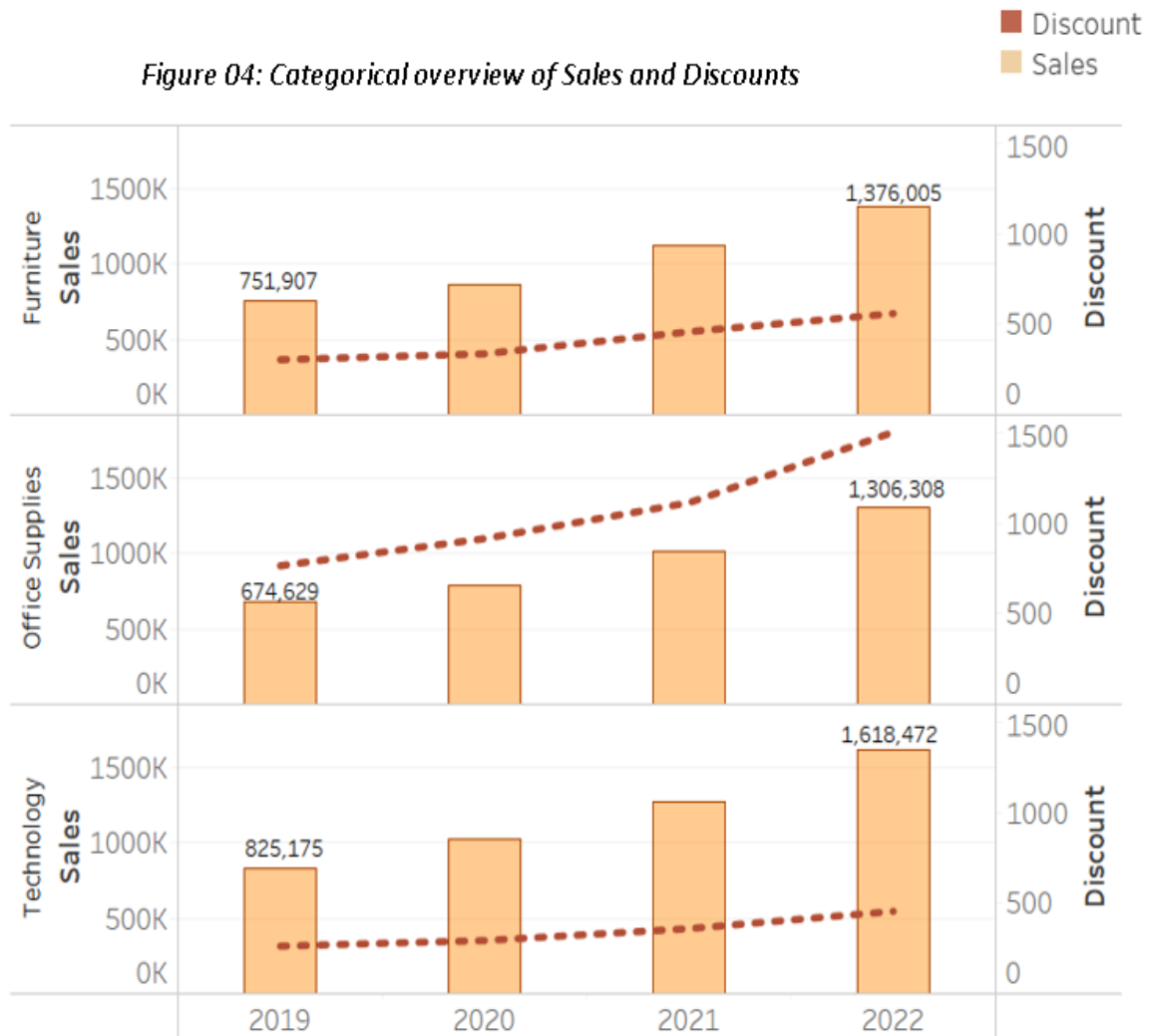
*Figure 03: Market Demand*

	Africa	APAC	Canada	EMEA	EU	LATAM	US	Grand Total
Furniture	631	2,425	42	768	1,500	2,380	2,120	9,866
Office Supplies	3,041	6,170	277	3,295	6,583	5,851	6,021	31,238
Technology	910	2,390	65	960	1,907	2,046	1,846	10,124
Grand Total	4,582	10,985	384	5,023	9,990	10,277	9,987	51,228

- Office Supplies have the highest demand with 61% of the total orders, because stationary items such as Paper get used-up quickly and need to be restocked often. The highest demand is from EU.
- Technology and Furniture are durable products and purchased in limited quantities.
- Overall, most orders are from APAC and least are from Canada.

## (2.2) Product Analysis

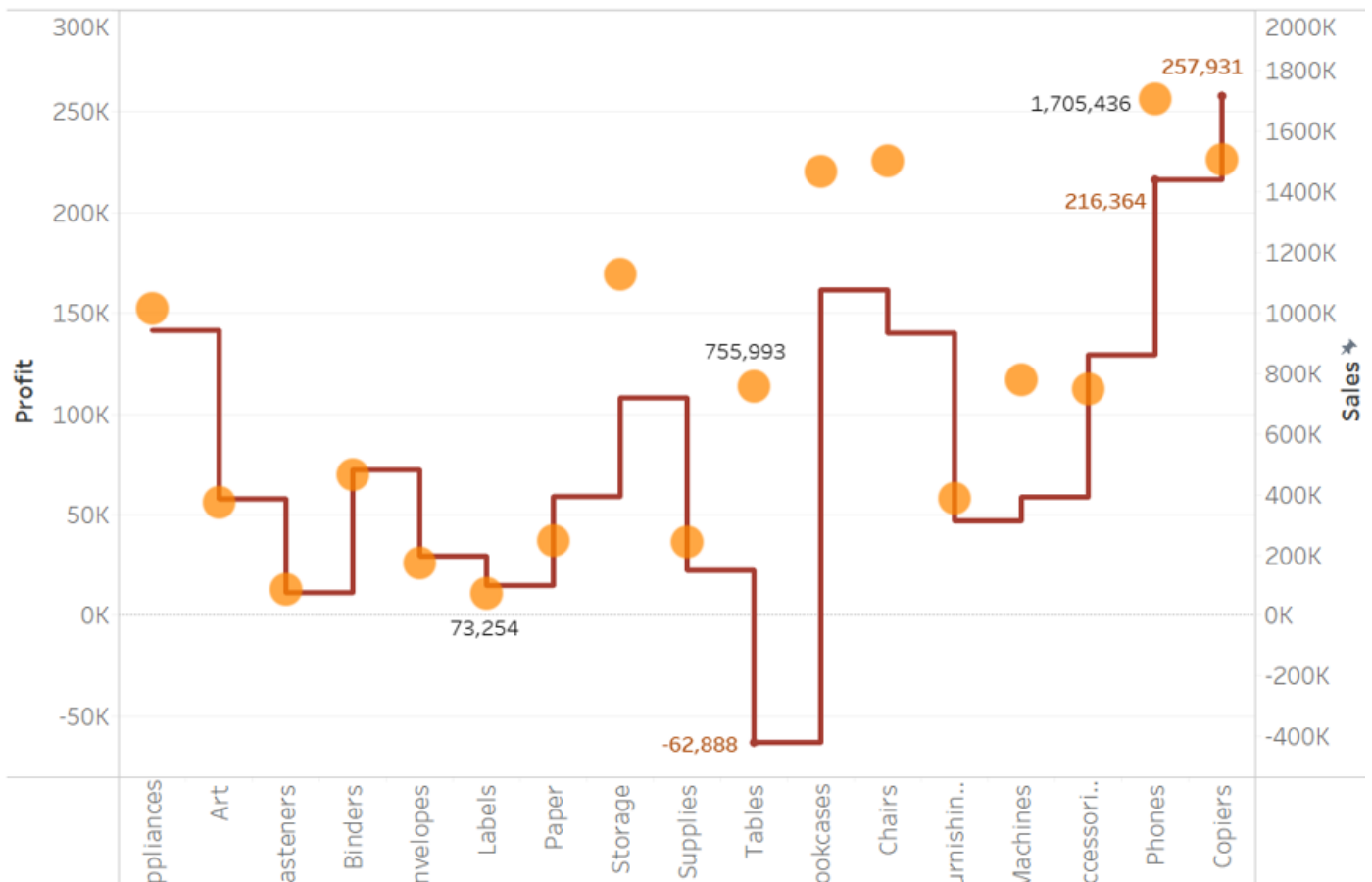
Figure 04: Categorical overview of Sales and Discounts



- Office Supplies generate lower sales despite its high order quantity, as its products are cheaper.  
Technology generates the highest sales over the years due to its high-value products.
- The discounts for Office Supplies have steadily risen over time, whereas it has barely increased for Technology and Furniture.

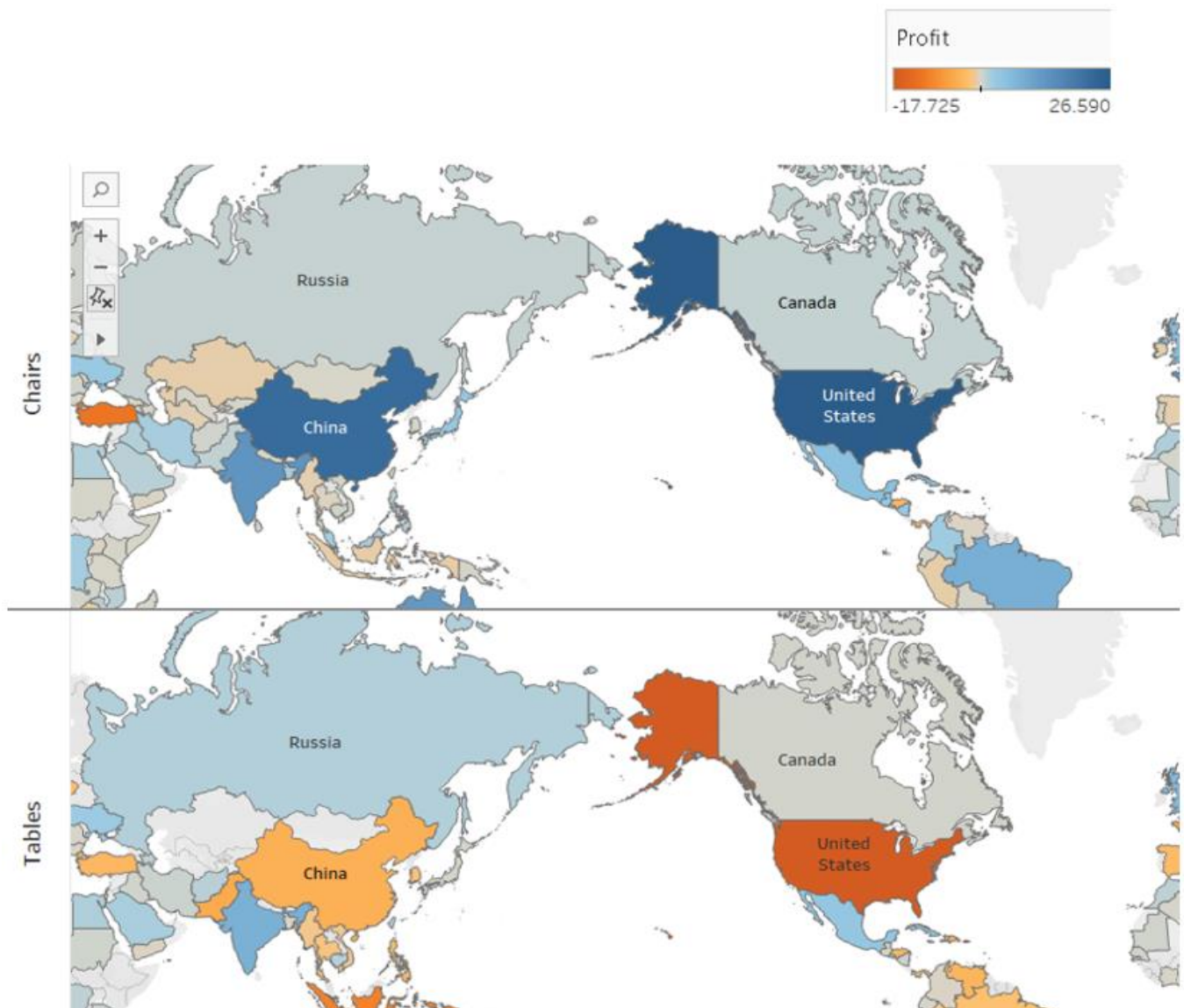


Figure 05: Sales vs Profits of Sub-Categories



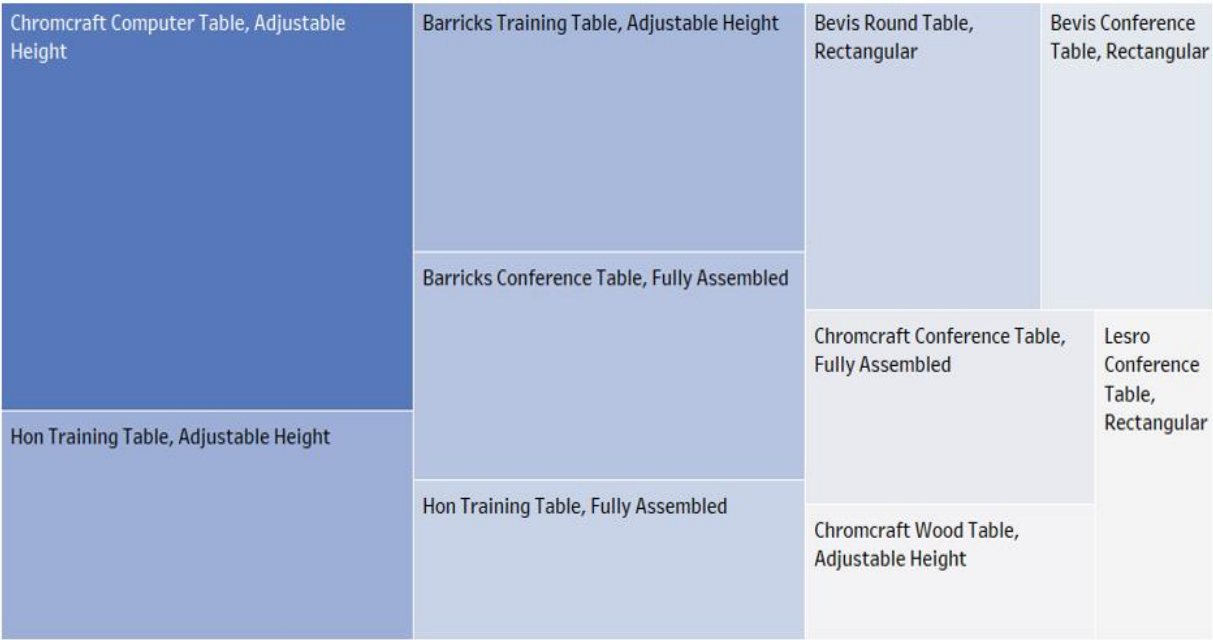
- Copiers make the highest profits (257,931), while Phones generate the highest sales (1,705,436).
- Tables are the only sub-category that produce negative profits (-62,888), despite having relatively good sales of 755,993.

Figure 06: Country-wise profit analysis of Chairs and Tables



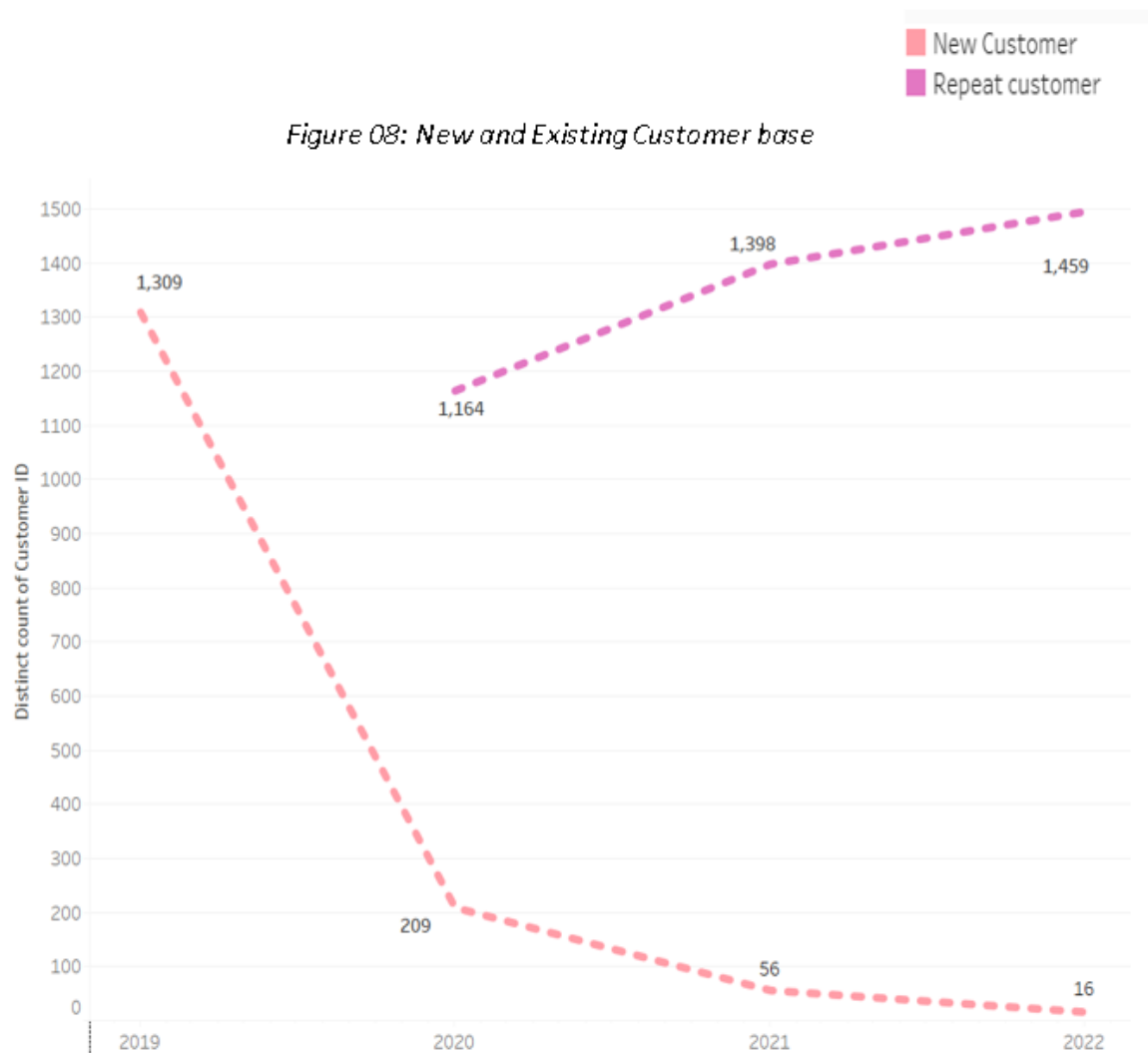
- Even though they are generally complementary products, Tables and Chairs produce contrasting profits in some countries.
- Chairs are highly profitable products, especially in US and China.
- Tables generate highly negative profits in US and smaller losses in China, due to the heavy discounts provided.
- These are dominant countries that directly influence the overall performance of these products.

Figure 07: Top-10 most profitable Tables in the United States



- These tables generate the highest profits in United States. They should be prioritized and sold in larger quantities to reduce overall losses from Tables.

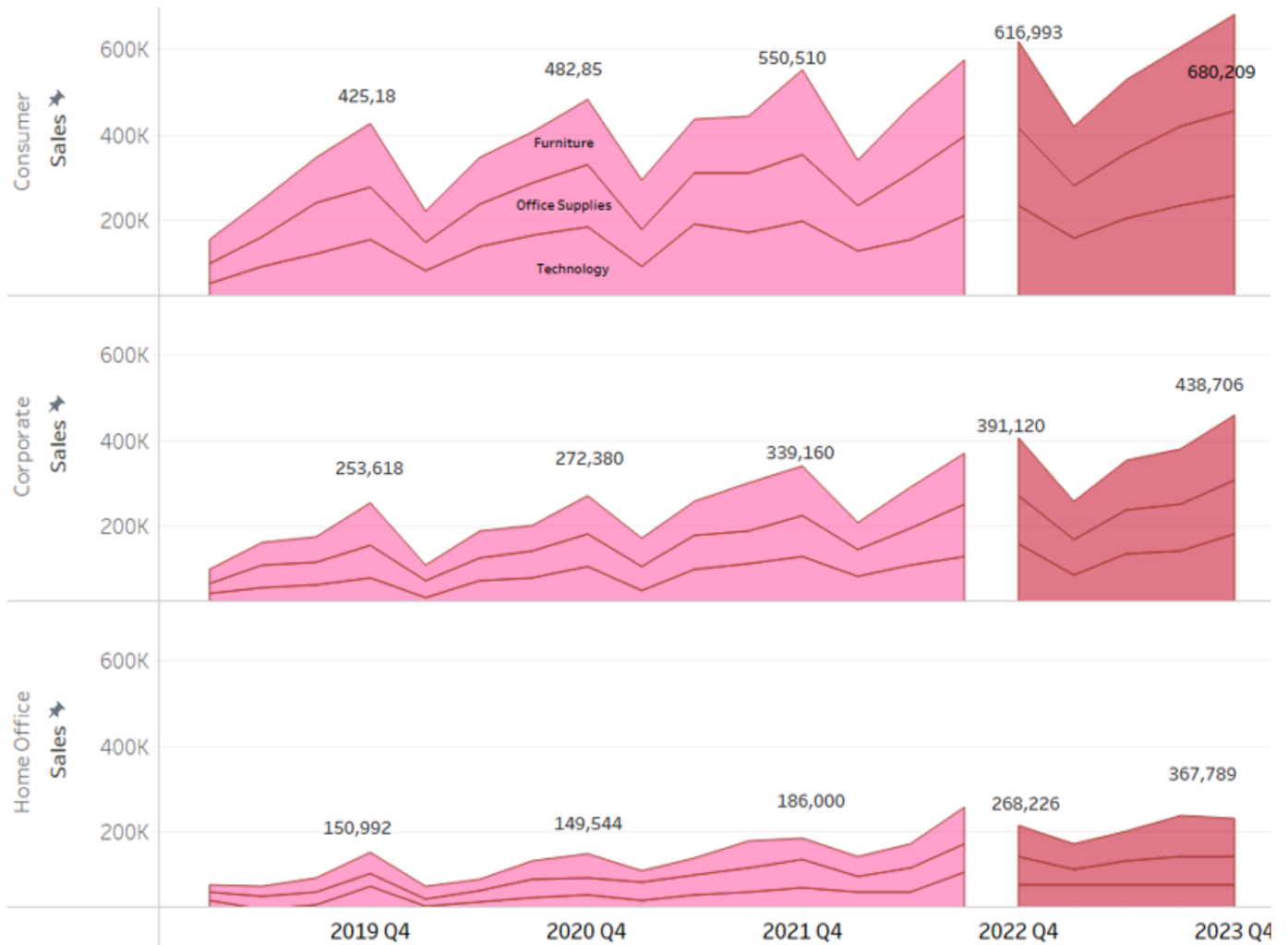
## (2.3) Customer Analysis



- We assume that all the customers in 2019 are new, as that is when the dataset begins.
- The total number of customers has increased from 1309 to 1511 from 2019-2022.
- The number of repeat customers is rising which indicates customer satisfaction, but there is a steep drop in the new customer acquisition.

Figure 09: Sales Forecast of Customer Segments

Actual  
Estimate



- Sales have increased continuously over the years and are predicted to keep rising.
- This indicates good performance in all three segments, where Consumer is the most profitable and Home Office is the least.
- Drops during the 1<sup>st</sup>-quarter (February, March) and peaks in the 4<sup>th</sup>-quarter (November, December) of each year, reflect how product demand is affected by seasonal changes.

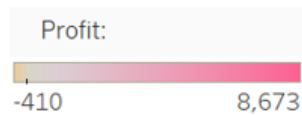
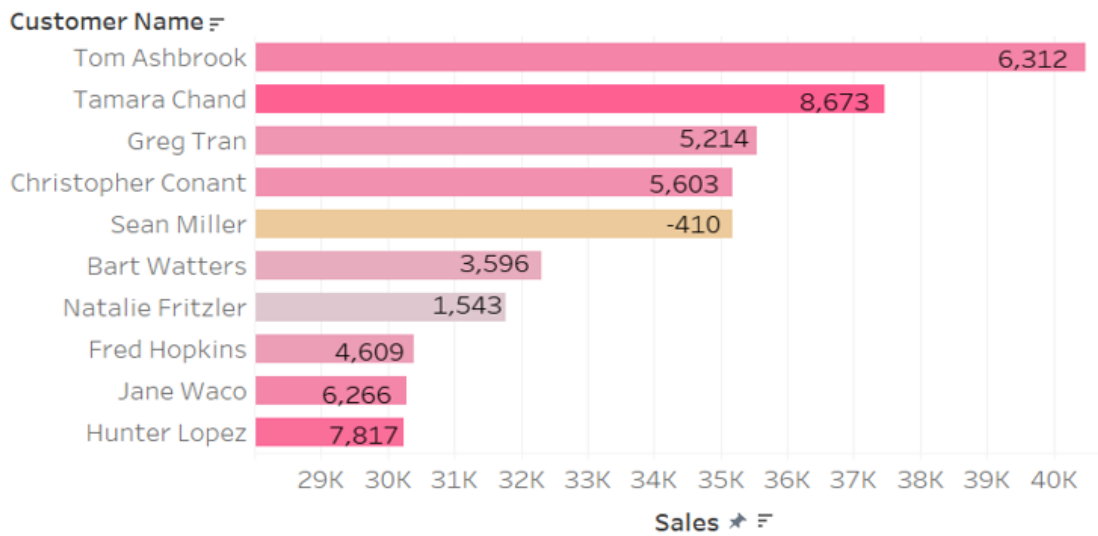


Figure 10: Top 10 Customers by Sale



- Tom Ashbrook is the top customer by sales.
- Sean Miller generates negative profits, despite having the 5<sup>th</sup> highest sales.
- Hunter Lopez is ranked 10<sup>th</sup> in sales but his profit is higher than the top customer.

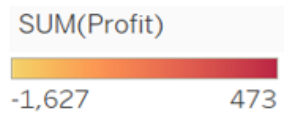
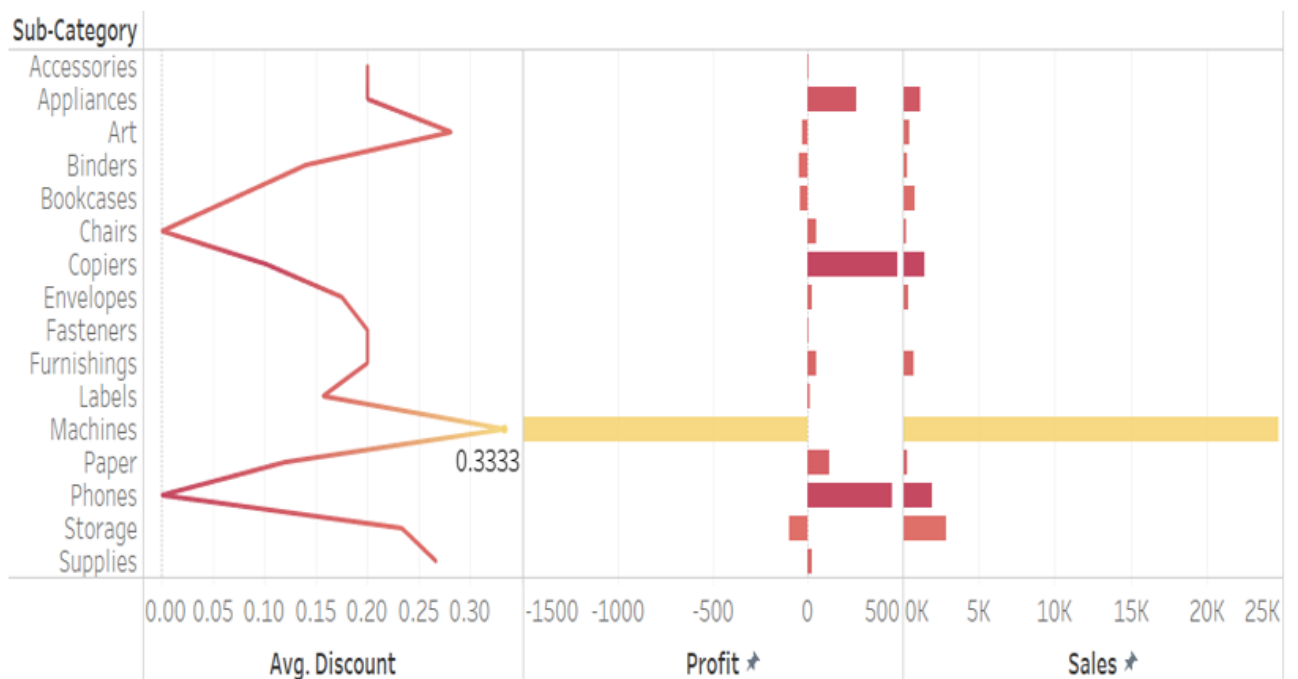
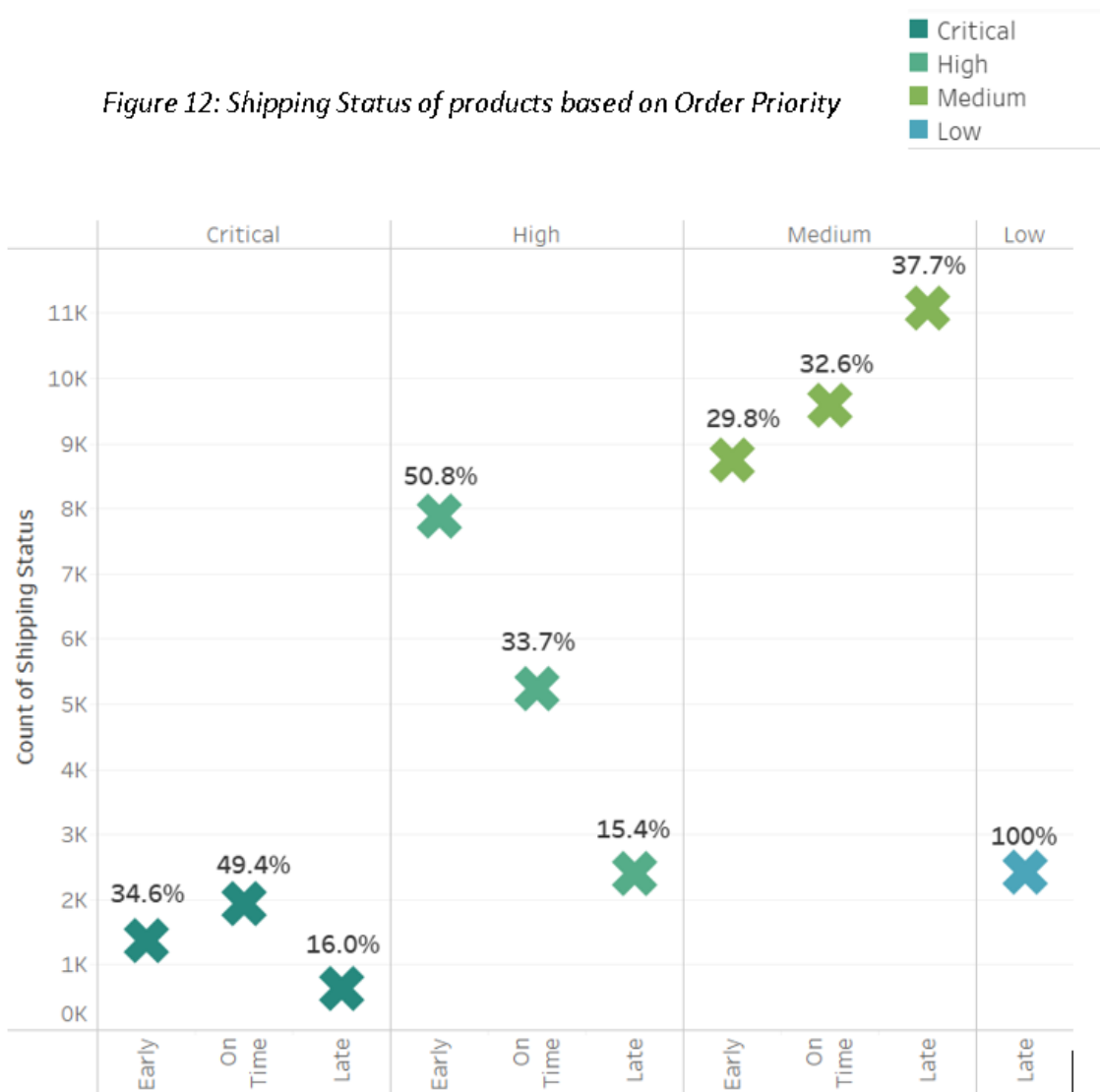


Figure 11: Products that contributed to Sean Miller's loss.



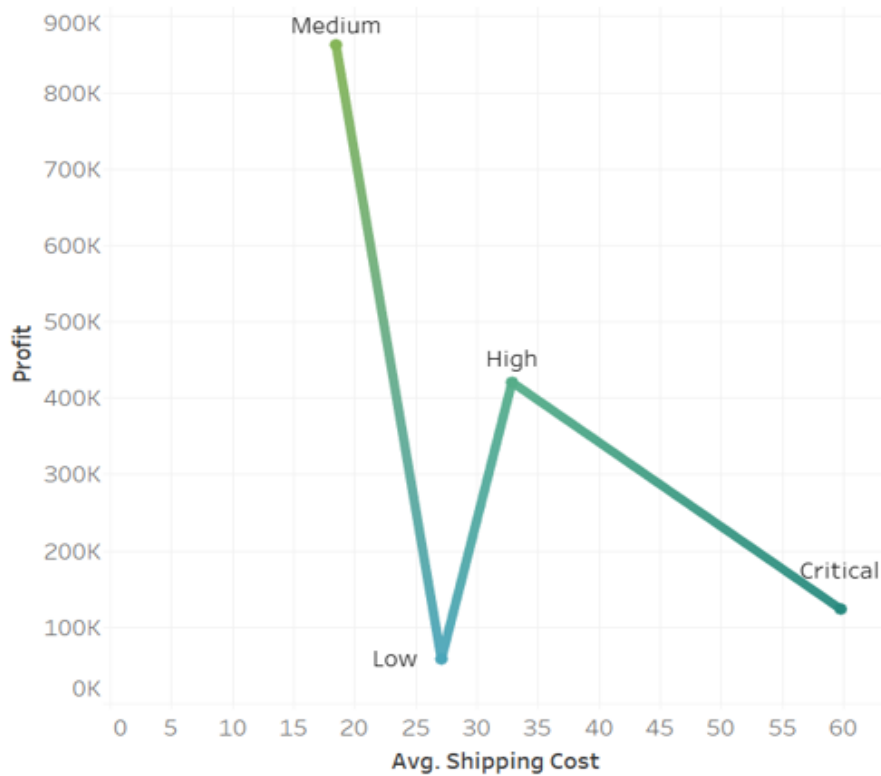
- Machines are the main contributor to his loss, even though they generate the highest sales. This is due to the highest discounts from machines.

## **(2.4) Shipping Analysis**



- 15-16% of Critical and High priority orders have been shipped late, despite their urgency and high shipping costs.
- All Low Priority orders and most of the Medium Priority orders (which have the highest demand) have also been delayed, showing disregard to lower priority orders.

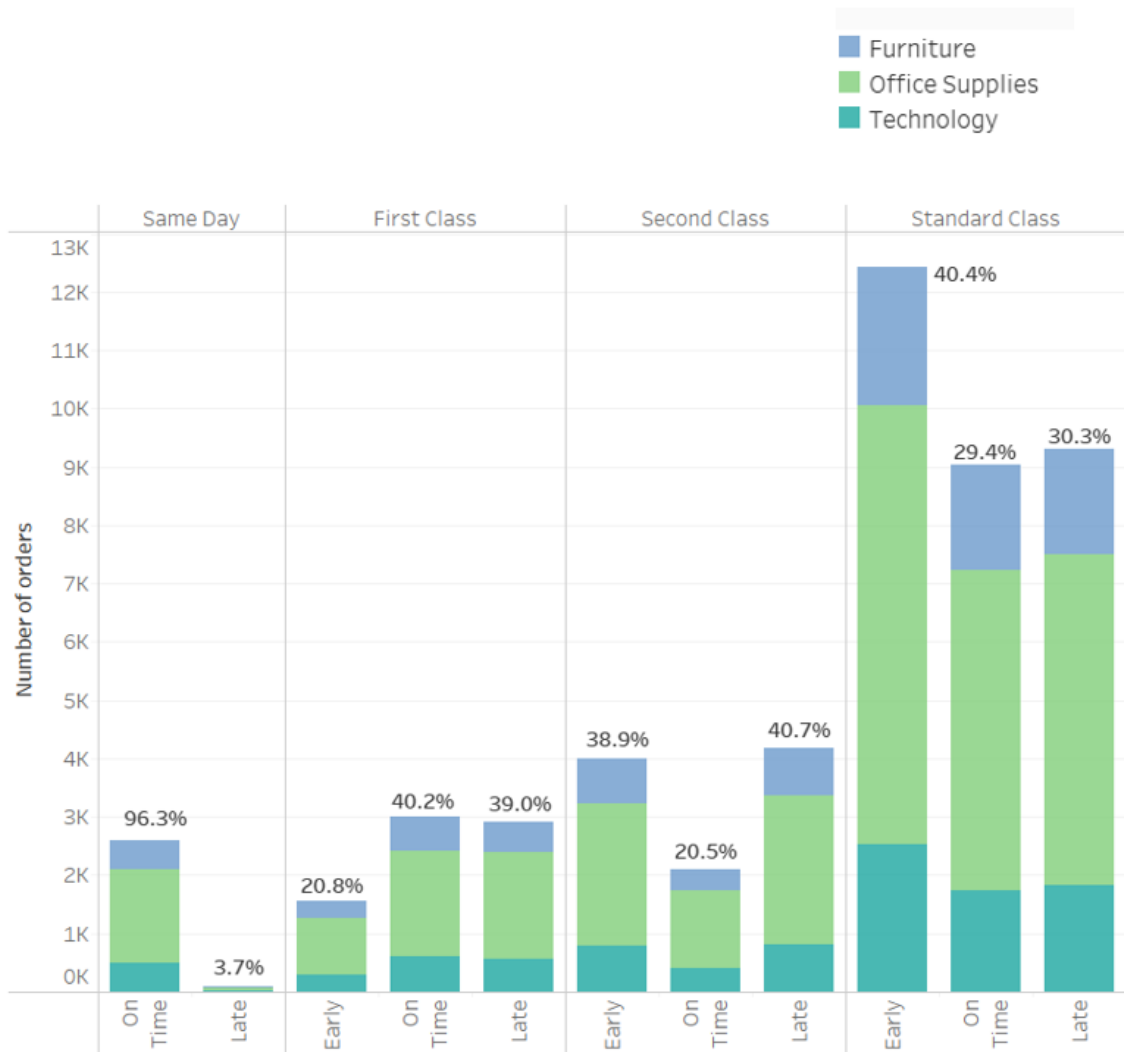
*Figure 13: Profit vs Average Shipping Cost of Order Priorities*



- Medium Priority has the lowest average shipping cost, even less than Low Priority. Hence it has the most orders and generates high profits.
- Critical Priority shipping is the least profitable due to low order quantity and heavy shipping costs.

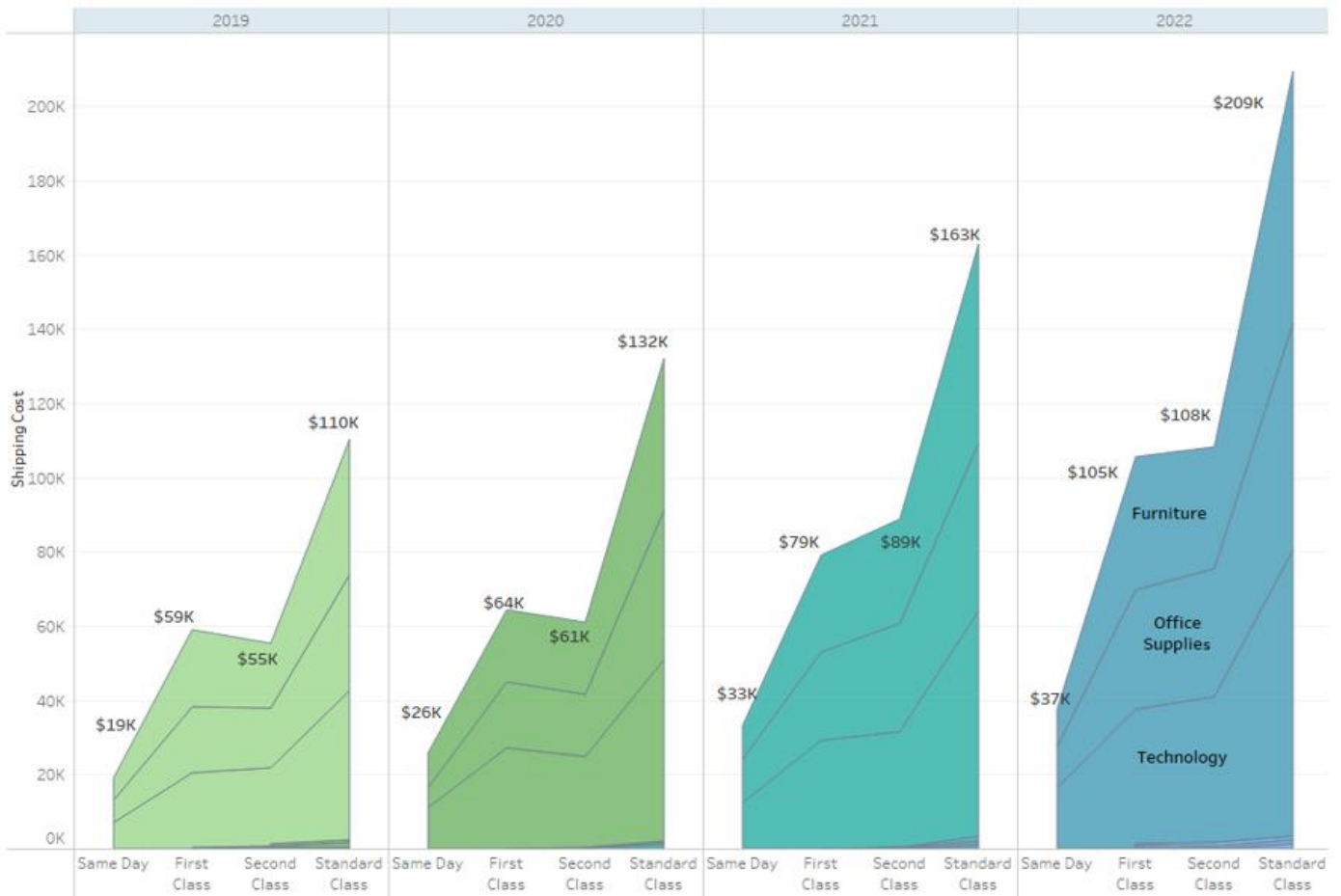


Figure 14: Shipping Status of Products with regard to Ship Mode



- Standard Class is the most favoured ship mode.
- A few of the Same Day orders have been delivered late which goes against the “Same Day” principle.
- Around 40% of First and Second Class orders have been delayed, whereas only 30% of Standard Class is late, even though it costs less.

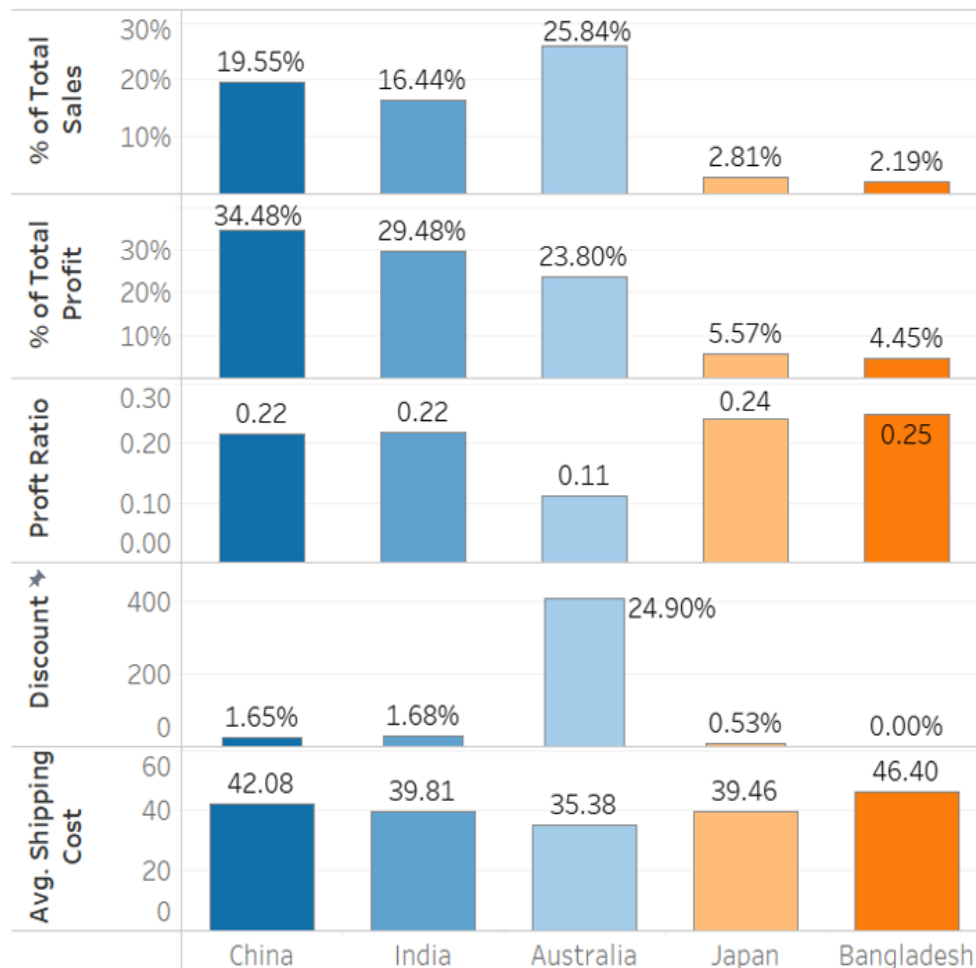
Figure 15: Yearly Shipping Costs for each Ship Mode



- Overall shipping cost has increased over the years.
- Generally, the Average shipping costs of Same Day>First Class>Second Class>Standard Class modes.  
But it is opposite for Total shipping costs as the number of orders for Standard Class is much higher than Same Day, which compensates for its low average cost.
- In 2019 and 2020, total shipping cost of First Class > Second Class but it's reversed in 2021 and 2022. This is because the increase in First Class orders from 2019-2020 is greater than the rise in Second Class orders.

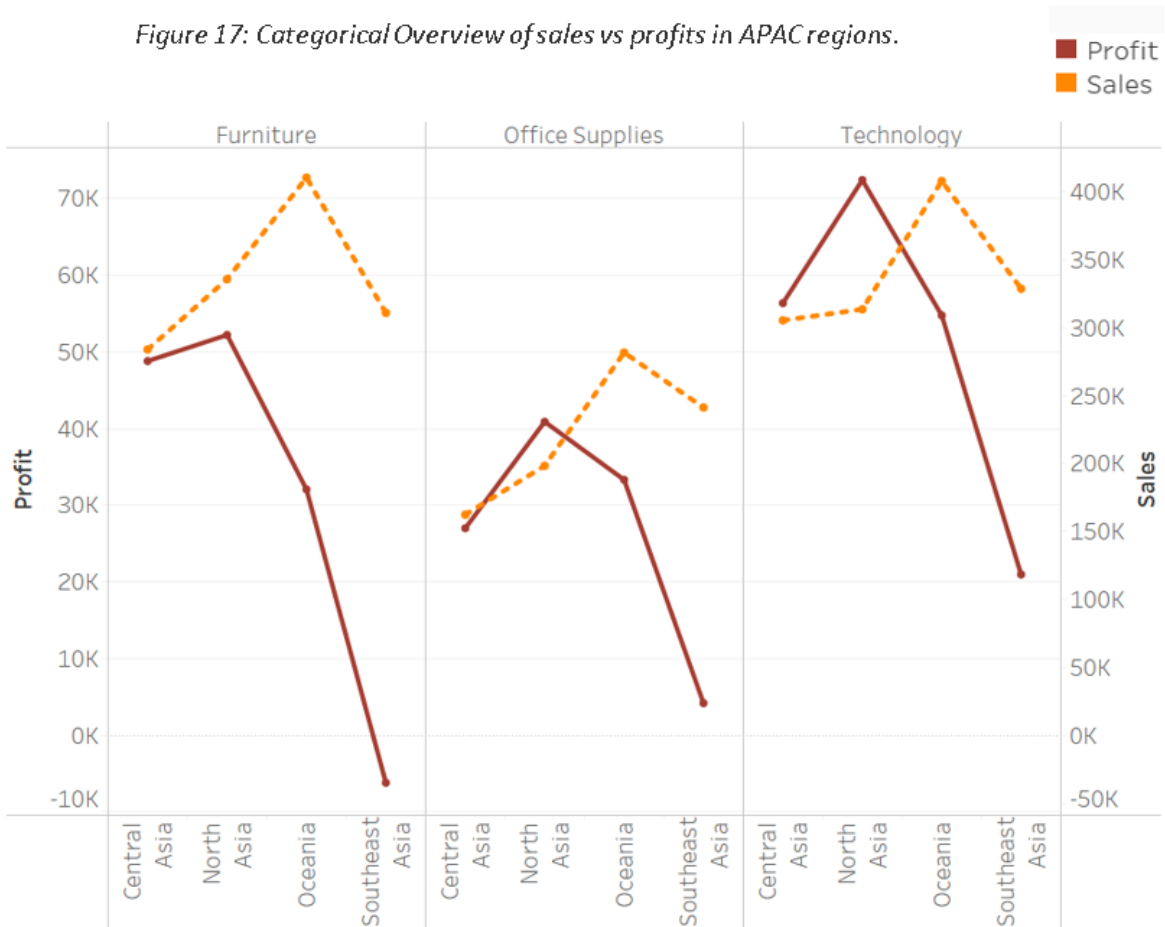
## (2.5) APAC Market Analysis

Figure 16: Analysis of Top 5 (Most Profitable) countries in APAC market



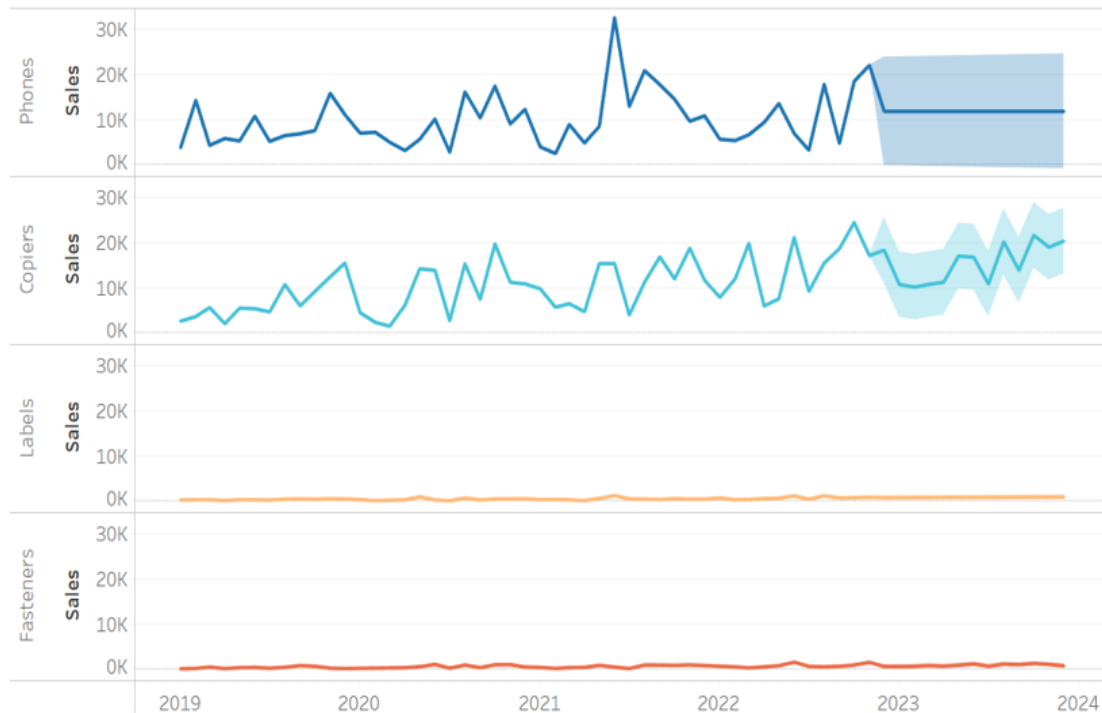
- China is the most profitable country in APAC (34.48%). It is 2<sup>nd</sup> highest in sales but the discounts of 1.65% help to optimize its profits.
- Australia produces the highest sales due to unusually large discounts of 24.90%, which also causes its profits to drop.
- Bangladesh is 5<sup>th</sup> place in both sales and profits because it has the highest shipping cost and gives zero discounts.
- Even though India and Japan have similar shipping costs and only 1% difference in discounts, they have a significant difference in Profits.

Figure 17: Categorical Overview of sales vs profits in APAC regions.



- North Asia is the most profitable region in APAC, even though it is the 3<sup>rd</sup> highest in Sales. Most of its profits are from Technology category.
- Southeast Asia has high sales but very low profits, as it gives 52% of APAC's total discounts. It generates negative profits from Furniture (due to Tables and Accessories).
- Oceania has the highest sales, but only 3<sup>rd</sup> highest profits.

Figure 18: Sales trend – Best and Worst selling Sub-categories



- Phones and Copiers were the best-selling sub-categories in APAC.
- Copiers show a positive growth trend for the upcoming years, whereas Phones indicate a constant level of sales.
- Labels and Fasteners produced the least sales. They show flat trend lines with no prospects of future growth.

Figure 19: Least profitable countries in APAC

Pakistan -22,447	Philippines -16,028	South Korea -12,793	Thailand -6,167
---------------------	------------------------	------------------------	--------------------

- They generate losses due to heavy discounts, which need to be minimized.

## Recommendations and Conclusion

Overall, the company is in a good position with steady profits and potential for business growth. However, the analysis proved that some areas of improvement include logistics marketing and cost management.

- ❖ **To boost performance in Africa and EMEA** – Their sales are low despite giving the highest discounts. The company should add products that cater to local preferences by conducting research and collaborating with local brands.  
EMEA should also decrease its discount rates to improve its profit ratio.
- ❖ **To boost sales in Canada** - Company should increase advertising, provide discounts and conduct strategic monitoring for possible competition.
- ❖ **Increase profits in Furniture category-** Tables generate losses as they have the highest discounts and shipping cost. Hence they should reduce the discount rate, optimize shipping and bundle tables with more profitable items. The least profitable products should be discontinued.
- ❖ **Retention of existing customers and attracting new customers** – can be done by social media advertising, promotional emails, discount codes for first-time buyers to encourage repeat purchases, loyalty points and target marketing. Low performing products should also be substituted with new ones, to diversify the product range.
- ❖ **Manage seasonal fluctuations** – with adjusted inventory and staffing. Create targeted promotions for peak seasons and use digital channels to promote them, introduce limited-edition festive products, and optimize costs during off-peak seasons.
- ❖ **Minimize shipment delays** – Extra priority must be given to the more expensive and popular shipping categories. Proper stock management and quick order processing is

required. If shipments are very late, customers should be compensated with partial refunds/discount codes for their next purchase, to ensure customer satisfaction.

❖ **Managing discounts in APAC market** – Australia doesn't require such large discounts as its low shipping cost already attracts customers. By reducing its discount rate, it can become the most profitable country in APAC.

- Southeast Asia should also increase its profits and profit-ratio through smaller discounts.

-Bangladesh should offer discounts of around 1-2%, to increase sales and compensate for its high shipping cost.

-Sales growth rate of Labels and Fasteners in APAC must be improved through discounts and marketing.