Executive Summary

From the analysis of the past transactions of Global Superstore, invaluable insights were discovered to provide actionable decisions for the organisation for the Asia-Pacific (APAC) market. The analysis focuses on the factors that impact sales, profits, and business operations, and how they can be optimised to help the organisation improve on its strategic planning to gain a competitive edge.

We first look at the overview performance in the APAC market throughout the years, followed by the impact of discount rates on sales and profits, and the implications of consumers' characteristics in each region. Next, we investigate the combination of items frequently purchased together using market basket analysis to understand our customers' purchasing behaviour. Afterwards, we shift our attention internally to the logistics department to identify poor-performing shipment modes. Finally, we will look into the sales and profit forecast for next year.

Through the analysis, it is found that:

- Southeast Asia performed poorly compared to other regions. It has low profit and profit ratio, caused by high discounts offered. The consumers are price inelastic and react poorly to discounts.
- The unprofitable countries have high average discounts but low sales. The higher discounting does not help increase sales in these countries. Some countries have a flat discount rate across products of different sub-categories.
- Tables sub-category performed badly due to high shipping costs and high discounts offered, and are often bought separately from chairs. The demand for tables far exceeds the demand for chairs.
- About 80% of orders shipped First Class were shipped late.
- Sales and profit are forecasted to drop sharply in the 2021 Q1, and the total profit is expected to fall by 1.42% next year.

From the results of the analysis, I propose the following recommendations:

- Tailor the discounting schemes based on the behaviour of the consumers and the market positioning of the organisation in the respective markets.
- Provide product recommendations to encourage purchase of complementary items (e.g. Tables and Chairs) and items frequently bought together (e.g. Papers, Storage and Binders).
- Improve on the logistics department of the organisation to reduce late shipments.

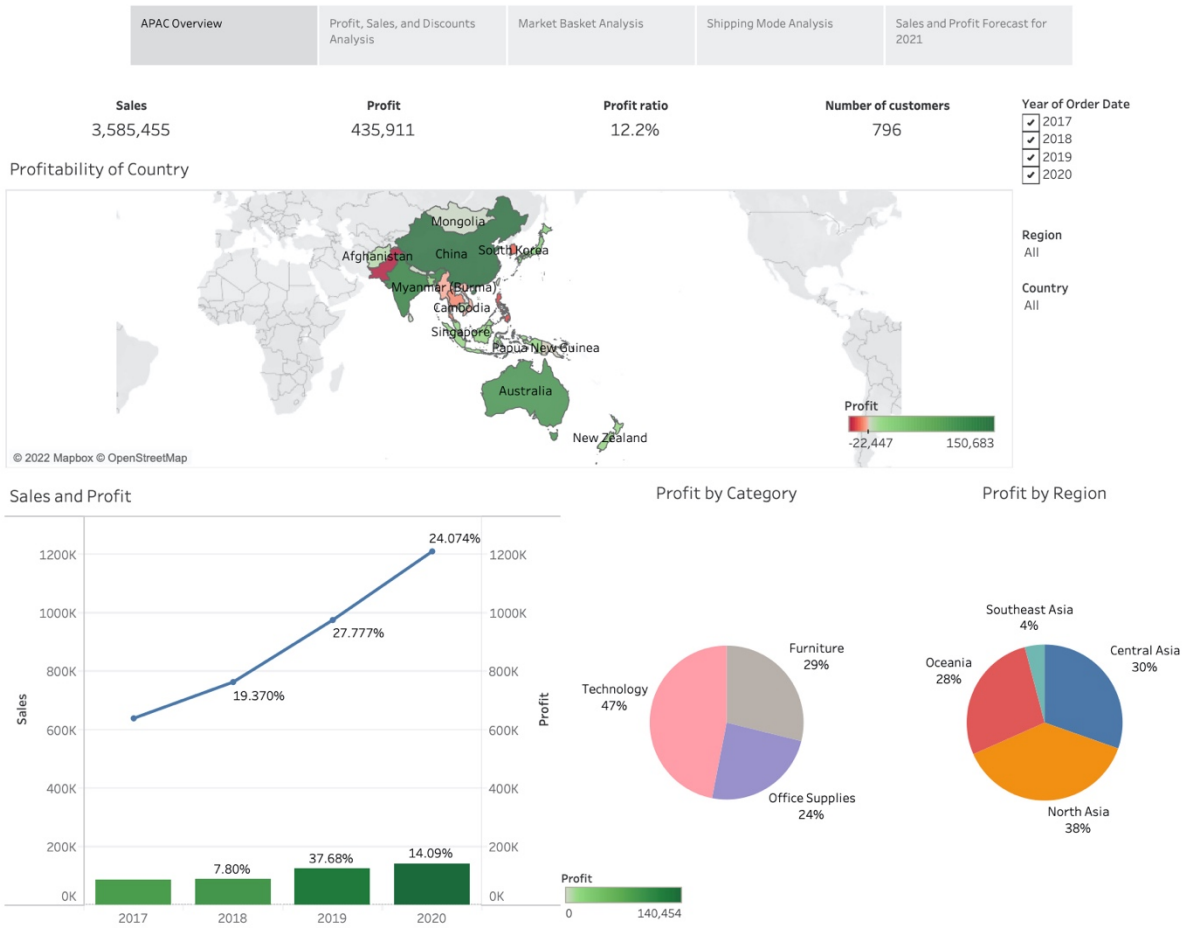
- Launch marketing campaigns in 2021 Q1 to reduce the forecasted decrease in sales and profit.

Introduction

This report discusses the business insights extracted from an exploratory analysis of the Global Superstore data of years 2017 to 2020 to help understand the sales and profits patterns throughout the years, and help identify areas of improvement to enhance the operations, profitability, and growth of the APAC market.

Findings

APAC Overview



Dashboard 1. APAC Overview

Dashboard 1 shows the general overview of the performance in APAC over the years. The header shows the total sales, profit, profit ratio, and number of customers. The map visualisation shows the profitability of the countries. From the visualisation, it can be seen that there are several countries which are unprofitable.

By hovering over the countries on the map, the sales, profit, and profit ratio[1] will be displayed. The top 3 countries with the highest profits, and the top 3 countries with largest losses are collated in the tables below:

Countries with highest profits:

Country	**Profit**	**Sales**	**Profit ratio**
China	$150,683	$700,562	21.51%
Australia	$103,818	$924,947	11.22%
India	$129,072	$589,650	21.89%

Countries with largest losses:

Country	**Profit**	**Sales**	**Profit ratio**
Pakistan	-$22,447	$58,873	-38.13%
Philippines	-$16,128	$183,420	-8.79%
South Korea	-$12,793	$33,125	-38.62%

By filtering on the regions, the following information can be obtained from the top of the dashboard:

Region	**Sales**	**Profit**	**Profit ratio**	**Number of customers**
Central Asia	$752,827	$132,480	17.6%	570
North Asia	$848,310	$165,578	19.5%	617
Oceania	$1,099,895	$120,000	10.9%	705
Southeast Asia	$884,423	$17,852	2%	672

One stark contrast is Southeast Asia. Despite its comparable sales, its profit and profit ratio is significantly lower than the rest of the regions and we will look into the reason in the next dashboard.

On the bottom left, the visualisation shows the sales and profit over the years with the Year-Over-Year growth displayed. Overall, the sales and profits have been growing every year. However, profitability for 2020 has been slowing down after a strong year in 2019.

[1] Profit Ratio is calculated by creating a Calculated Field, with formula 'SUM([Profit])/SUM([Sales])'

From the pie charts, we can see that the Technology sub-category dominates in profitability, accounting for 47% of the profits while Furniture and Office Supplies account for 29% and 24% respectively. Comparing by region, Southeast Asia is the least profitable, accounting for only 4% of the profits while North Asia is the most profitable, accounting for 38%.

Profit, Sales, and Discounts Analysis

Dashboard 2. Profit, Sales, and Discounts Analysis

Dashboard 2 shows the Profit, Sales, and Average Discount compared by region, country, and sub-category[2]. The category visualisation has an additional column Average Shipping Cost Per Item[3].

[2] Envelopes, Fasteners, Labels, Paper, Binders, and Supplies have been grouped together as Small Office Supplies.

[3] Average Shipping Cost Per Item is calculated by creating a Calculated Field, with formula 'SUM([Shipping Cost])/SUM([Quantity])'

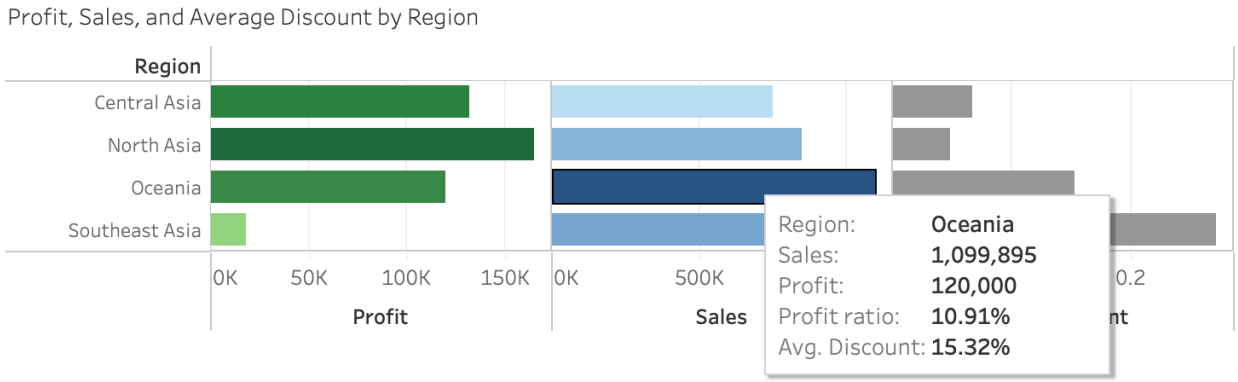


Figure 2.1. Profit, Sales, and Average Discount by Region, hovered over Oceania

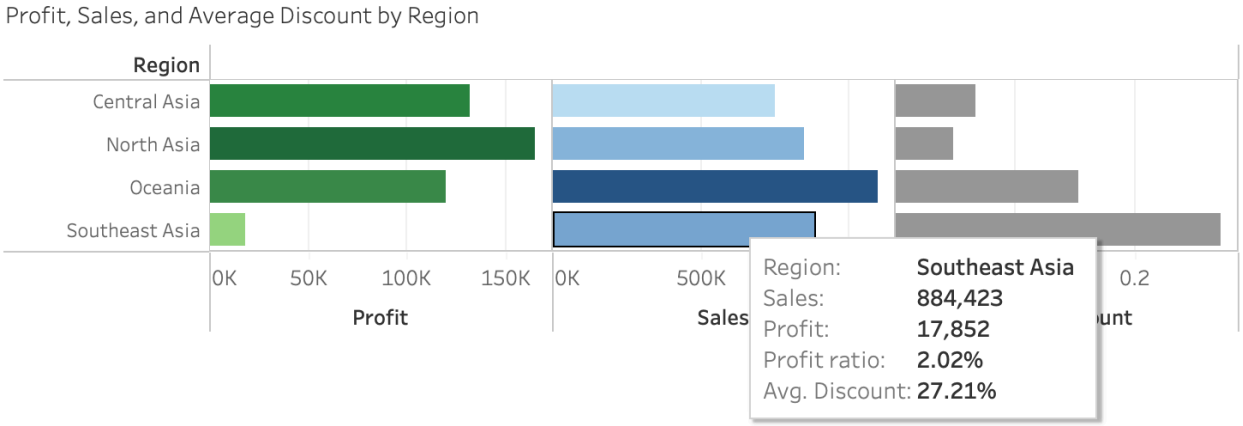


Figure 2.2. Profit, Sales, and Average Discount by Region, hovered over Southeast Asia

From the first visualisation (Figures 2.1 and 2.2), we can see that Oceania region reacts well to discounts. With an average discount of 15.32%, the Oceania region has the highest sales in APAC, with a 10.91% profit ratio. On the other hand, the Southeast Asia region seems to be more price inelastic and react poorly to discounts. Despite having the highest average discount of 27.21%, the sales of the Southeast Asia region barely surpass that of the Central Asia and North Asia regions, which have much lower average discounts.

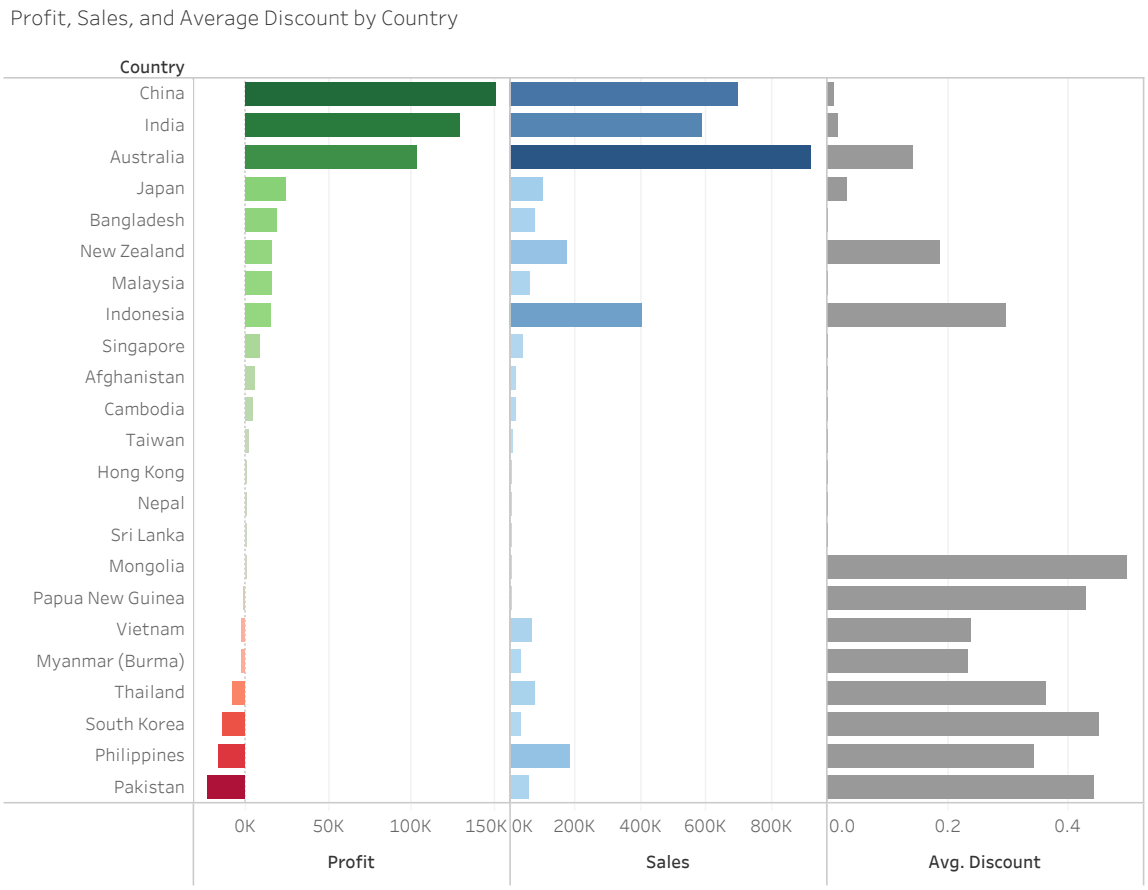


Figure 2.3. Profit, Sales, and Average Discount by Country

The second visualisation (Figure 2.3) sheds light on the following points:

1. For the unprofitable countries, the average discount given ranges from 23% to 50% but the sales are still quite low. The higher discounting does not help increase sales in these countries.

2. Australia, which has the highest sales in APAC, has a relatively high average discount of 14.36% compared to other top-performing countries like China and India which have less than 2% average discount.

3. New Zealand and Indonesia, although profitable and have relatively higher sales, have high average discounts of about 20% and 30% respectively.

4. There are a number of countries with low sales and no or low discount.

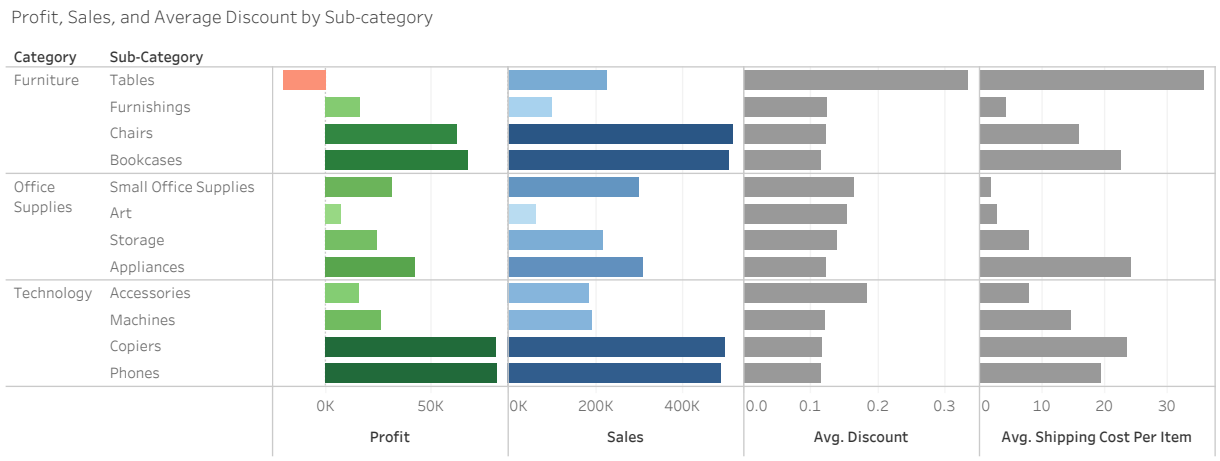


Figure 2.4. Profit, Sales, and Average Discount by Sub-category

From the last visualisation (Figure 2.4), the following points that can be noticed:

1. Table is the only sub-category which is unprofitable across the whole APAC market. The unprofitability is due to the high average shipping cost of $36 per table and high average discount of 33.40%.

2. Bookcases, Chairs, Copiers, and Phones sub-categories yield the highest profit and have the highest sales.

3. By filtering on the different countries, it can be seen that Pakistan, South Korea, Myanmar, and Vietnam have a flat discount rate across the different sub-categories as shown in Figure 2.5 – 2.8.

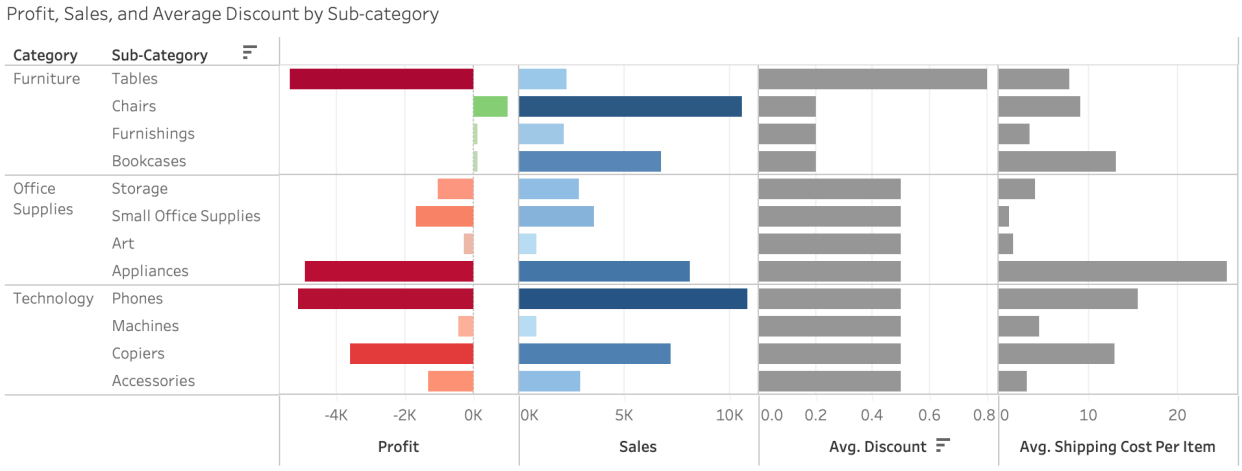


Figure 2.5. Profit, Sales, and Average Discount by Sub-category, filtered on Pakistan

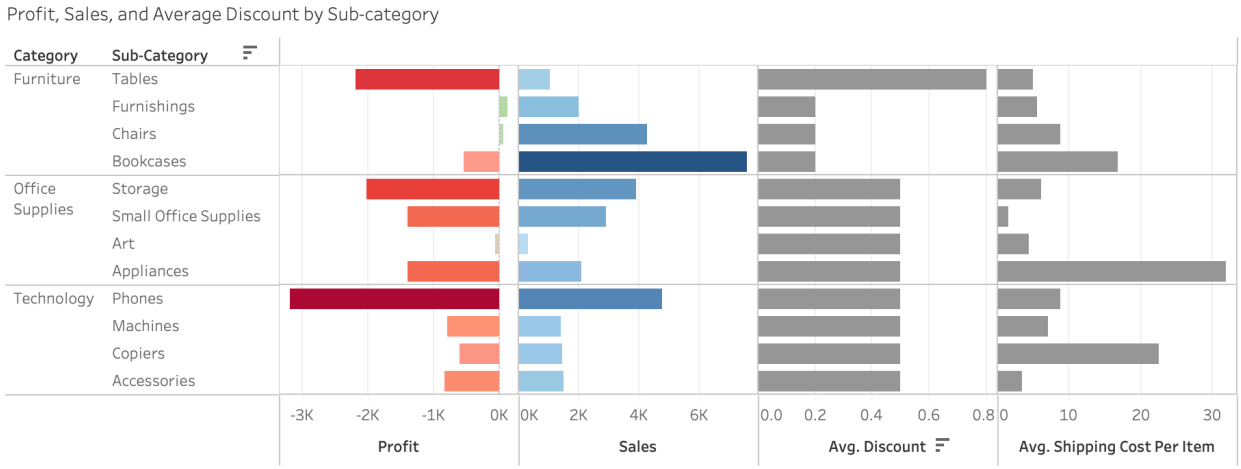


Figure 2.6. Profit, Sales, and Average Discount by Sub-category, filtered on South Korea

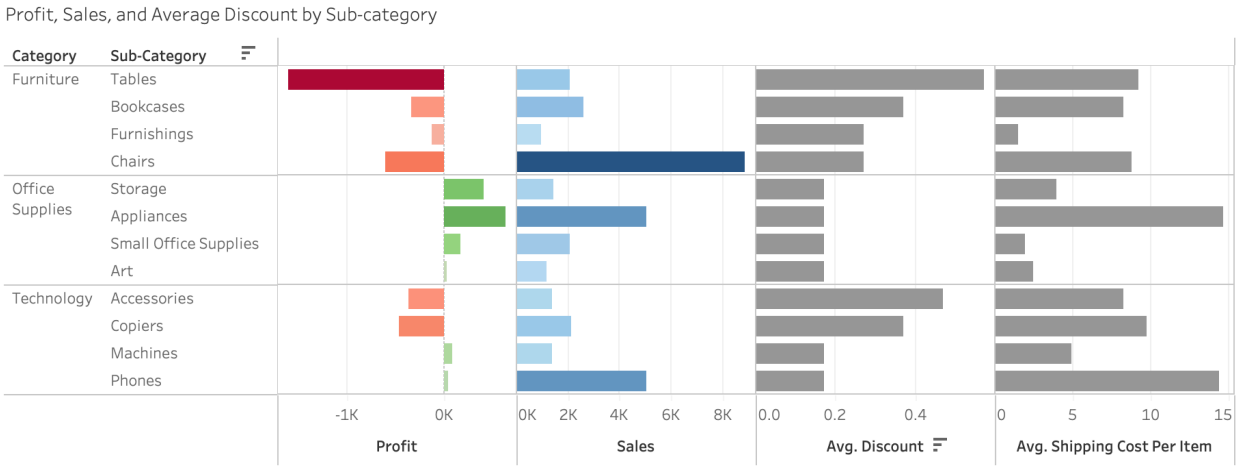


Figure 2.7. Profit, Sales, and Average Discount by Sub-category, filtered on Myanmar

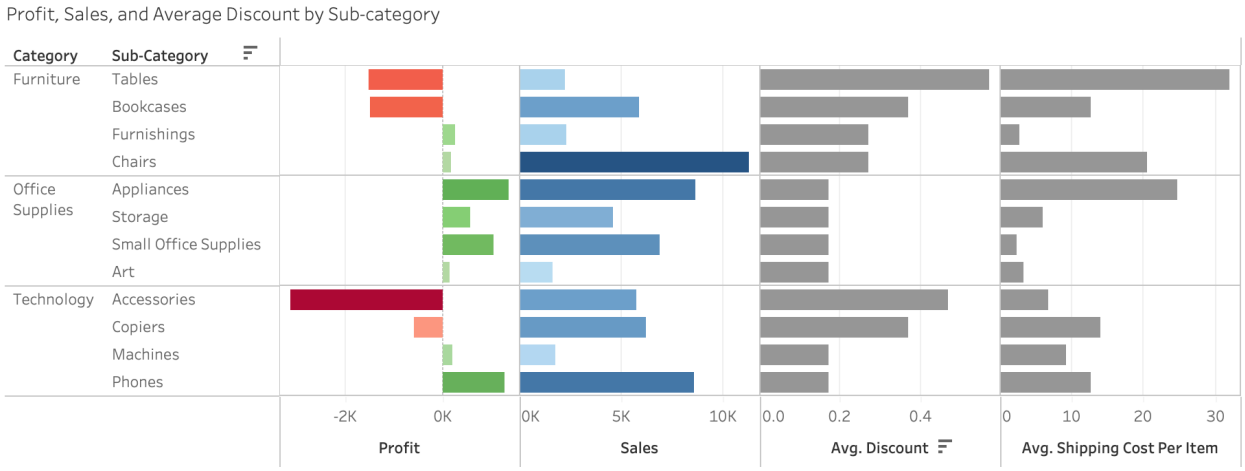
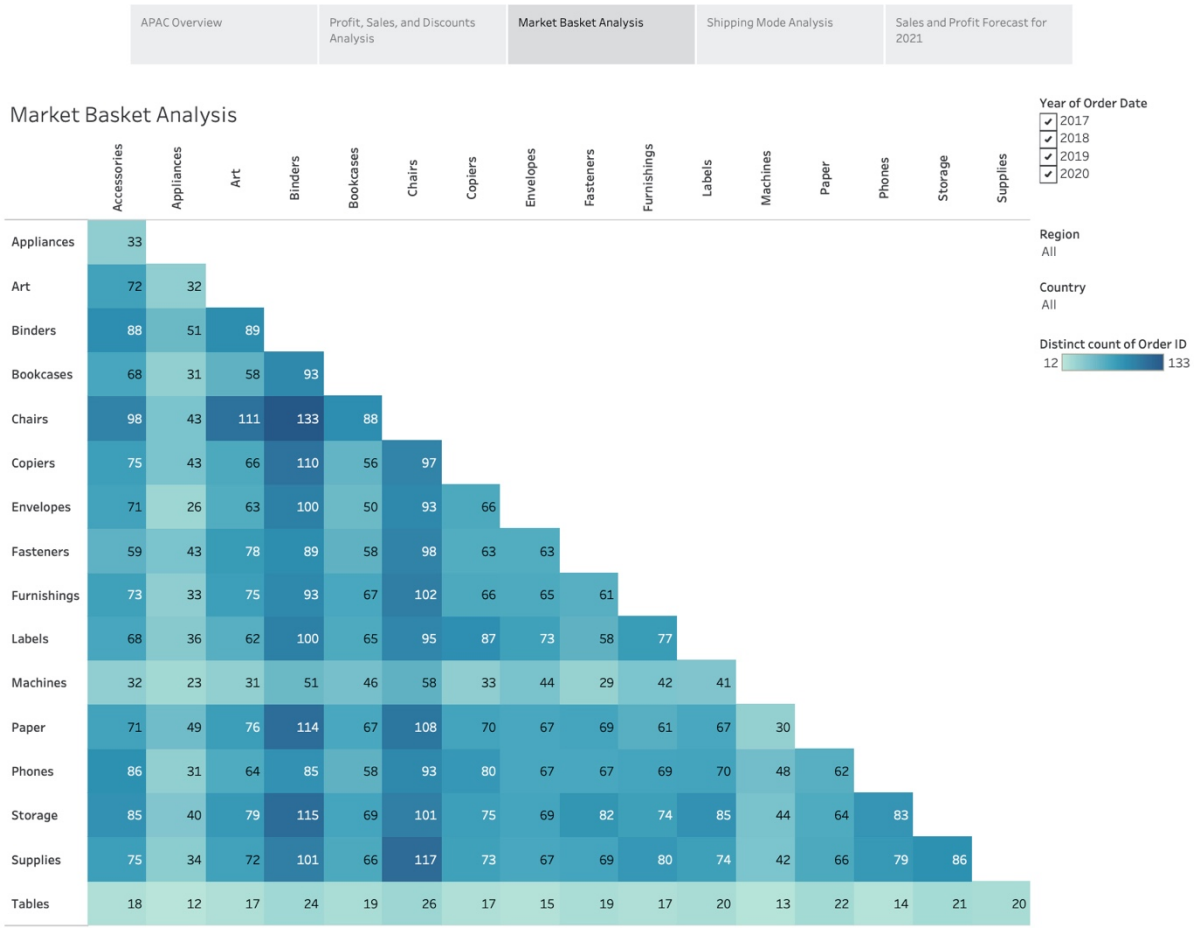


Figure 2.8. Profit, Sales, and Average Discount by Sub-category, filtered on Vietnam

Market Basket Analysis



	Accessories	Appliances	Art	Binders	Bookcases	Chairs	Copiers	Envelopes	Fasteners	Furnishings	Labels	Machines	Paper	Phones	Storage	Supplies
Appliances	33															
Art	72	32														
Binders	88	51	89													
Bookcases	68	31	58	93												
Chairs	98	43	111	133	88											
Copiers	75	43	66	110	56	97										
Envelopes	71	26	63	100	50	93	66									
Fasteners	59	43	78	89	58	98	63	63								
Furnishings	73	33	75	93	67	102	66	65	61							
Labels	68	36	62	100	65	95	87	73	58	77						
Machines	32	23	31	51	46	58	33	44	29	42	41					
Paper	71	49	76	114	67	108	70	67	69	61	67	30				
Phones	86	31	64	85	58	93	80	67	67	69	70	48	62			
Storage	85	40	79	115	69	101	75	69	82	74	85	44	64	83		
Supplies	75	34	72	101	66	117	73	67	69	80	74	42	66	79	86	
Tables	18	12	17	24	19	26	17	15	19	17	20	13	22	14	21	20

Dashboard 3. Market Basket Analysis

Dashboard 3 gives us an insight of customers' purchasing behaviour by looking at the combination of items that are commonly purchased together. We can use this information to cross-sell products by providing product recommendations when a customer is placing an order. The numbers in the visualisation represent the number of orders which contain both products from the sub-categories on the x and y axes.

Looking at the Binders row and column, it is evident that Binders have a relatively higher number of orders that are paired with other sub-categories. This means that when consumers are buying other items, they are likely to purchase binders as well.

Additionally, one may hold the view that tables and chairs are frequently purchased together. However, the market basket analysis proves the contrary for our customers. Looking at the Tables row and Chairs column, only 26 transactions contain both tables and chairs in a single order despite the high discount rate offered on Tables as established in the previous dashboard. The total quantity sold for Tables is only 684 while Chairs is 3594 as shown in Figures 3.1 and 3.2.

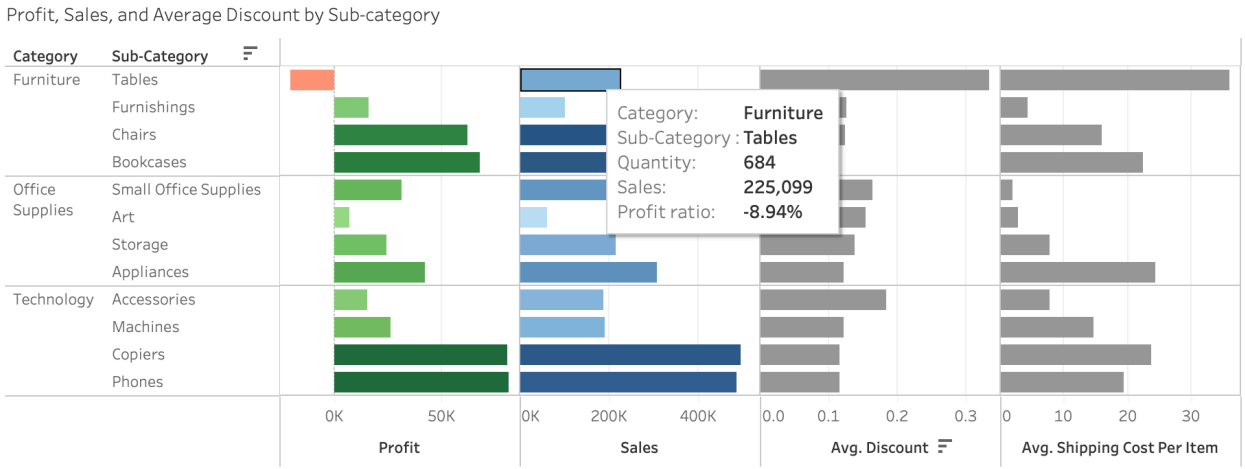


Figure 3.1. Quantity of Tables sold

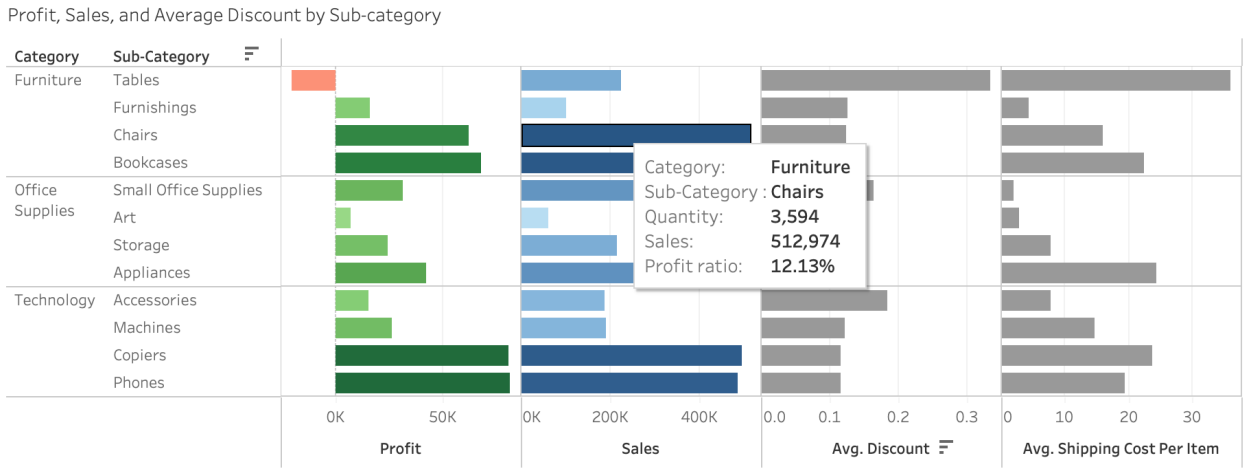


Figure 3.2. Quantity of Chairs sold

Shipping Mode Analysis

Dashboard 4. Shipping Mode Analysis

Dashboard 4 shows the number of orders that were shipped late[4] according to the regions.

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[4] The number of days for an order to be shipped is assumed to be: Within the same day, 1 day, 3 days, 6 days for Same Day, First Class, Second Class, Standard Class shipping modes respectively.

To set the scheduled number of days for each ship mode, a Calculated Field, 'Days to Ship Scheduled', was created with formula 'CASE [Ship Mode] WHEN "Same Day" THEN 0 WHEN "First Class" THEN 1 WHEN "Second Class" THEN 3 WHEN "Standard Class" THEN 6 END'.

To calculate the days between Order Date and Ship Date, a Calculated Field, 'Days to Ship Actual', was created with formula 'DATEDIFF('day' [Order Date], [Ship Date])'.

To determine if an order was shipped early/late/on time, a Calculated Field was created with formula 'IF [Days to Ship Actual] > [Days to Ship Scheduled] THEN "Shipped Late" ELSEIF [Days to Ship Actual] = [Days to Ship Scheduled] THEN "Shipped On Time" ELSE "Shipped Early" END'.

Across the 4 years, the percentage of orders shipped late is about 25%. One critical point to take note is that 75% to 85% of orders shipped First Class and 35% to 48% shipped Second Class were late.

From the pie chart, it can be seen that of all orders that are shipped late, about 46% comes from First Class shipping, 21% from Standard Class shipping, and 33% from Second Class shipping.

Sales and Profits Forecast for 2021

Dashboard 5. Sales and Profit Forecast for 2021

The forecast for the sales and profit for year 2021, based on the seasonality and trend of the past performance, is shown on Dashboard 5. The darker-coloured lines represent the historical values and the lighter-coloured lines represent the forecasted values. The sales and profit is projected to drop sharply in the first quarter before rallying after the third quarter. The total forecasted sales and profit by the end of the year is $1,387,503 and $138,464 respectively, which translates to 14.75% increase in sales but 1.42% decrease in profit compared to 2020[5].

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[5] Forecasted percentage change in sales = $\frac{Forecasted\ Sales\ in\ 2021 - Sales\ in\ 2020}{Sales\ in\ 2020}$ * 100%

$= \frac{(283658+335530+332878+435437) - (219611+266970+307892+414726)}{(219611+266970+307892+414726)}$ * 100% = 14.75%

[5] Forecasted percentage change in profit = $\frac{Forecasted\ Profit\ in\ 2021 - Profit\ in\ 2020}{Profit\ in\ 2020}$ * 100%

$= \frac{(21261+38145+26954+52104) - (18983+28410+34169+58893)}{(18983+28410+34169+58893)}$ * 100% = -1.42%

Recommendations

General recommendations

To increase the sales and profits, the organisation should tailor the discounting schemes based on the behaviour of the consumers and the market positioning of the organisation in the respective markets.

Focus on Bookcases, Chairs, Copiers, and Phones to spearhead growth as they bring in the highest profit and sales.

Provide product recommendations in the checkout page to encourage purchase of complementary items (e.g. Tables and Chairs) and items frequently bought together (e.g. Papers, Storage and Binders).

To increase the profitability of Tables, the management should consider reducing the discount offered and negotiating for better shipping rates. Tables and Chairs could be sold as a set to encourage purchase of tables.

The logistics department needs to be improved to reduce the number of orders shipped late, with extra emphasis on the orders shipped First Class and Second Class.

Marketing campaigns can be launched in 2021 Q1 to reduce the forecasted decrease in sales. One way is to increase the discounts in Central Asia, North Asia, and Oceania as the consumers in these regions are more price elastic. For Southeast Asia, the management should look into other non-price marketing strategies to increase sales as the consumers are price inelastic and the profit ratio for the region is at only 2%. Any increase in discount offered in Southeast Asia may incur losses.

Region-specific recommendations

Oceania: With its high sales and number of customers, Global Superstore is likely to have a well-established brand presence and customer base in the market. The management can consider lowering the discounts offered to the Oceania customers to increase profitability.

Southeast Asia: Due to the low profit ratio and price-inelastic consumers in Vietnam, Myanmar, Thailand, and Philippines, the discounts offered in these countries should be reduced to increase profitability. For Malaysia, Singapore, and Cambodia, consider offering some discount to increase sales as there has been no discount throughout the years.

Country-specific recommendations

For countries with low sales and average discount, the management can consider offering a higher discount to increase sales and attract more customers. On the other side of the spectrum, countries with low sales despite high average discounts should focus on other marketing techniques and lower the discount offered.

Indonesia, New Zealand: As their sales are relatively high, the discount offered can be decreased by a few percentage points. This can help increase profit ratio.

Pakistan, South Korea, Vietnam, Myanmar: Instead of a flat discount rate across the categories, offer different discount rates for different products based on the sales and quantity sold. Discount rate should be lower for products with higher sales and quantity, and vice versa.