

Executive Summary

In this report, the visualisations made using the given company dataset are described. From the start, sales data is presented as a plot to show that most buyers are contained in the Asia-Pacific, European and US regions. This is continued by a tree map, which reflects sales and quantity data for various item sub-categories. It was proven here that quantity and revenue are not directly related, and there can be fewer phones sold than binders while overall sales will still be higher for the first group. The profit achievements are then discussed across countries and segments: Turkey and Nigeria appear to be the most lossy, while the consumer segment accounts for more than half of all profit. It was also shown that profit and sales are positively correlated and that the Central region owns the highest values of both of these measures. Then items' monthly sales trends are observed, divided by categories and sub-categories. In a furniture group, bookcases and chairs overlap one another according to months. Similarly storage with appliances and copiers with phones perform. After that, the shipping details are considered. Different categories appear to bring a higher average profit depending on the mode of shipment. Also, average shipping costs are approximately the same in the median for all months, with only December's median being higher, probably because of complicated transportation due to harsh weather conditions. Finally, the trends in sales and the regions' preferences are overlooked to make predictions and increase profit. Sales generally go up monthly and annually, indicating healthy growth for the company. Also, the transitions between months are becoming more and more smooth. It is observed on the final chart that in different regions different categories of items are demanded, and these preferences change over time. Overall, the trend is positive for demand in all regions. It is concluded that the company is making good progress, but there is still room for improvement.

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1. General Sales

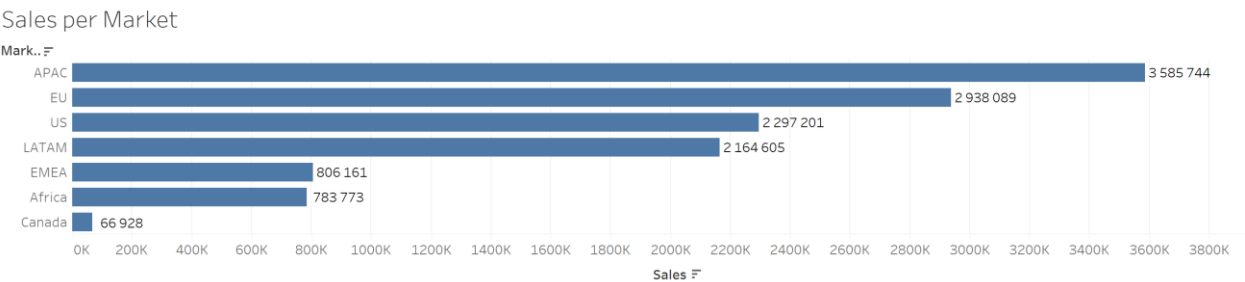


Figure 1. Bar chart visualizing the sales data per market.

To begin, it will be useful to know how successful the company is in its business. According to the data presented in Figure 1, the market that is most interested in the company's goods is APAC. It means that countries like Australia, India and China are the most reliable customers. This can be explained by the large size of this market: India, China, and some other countries have the largest populations in the world. Australia is also quite a wealthy country, where people can afford to have new items shipped to them often. After APAC, the EU market follows, with the difference in number of sales exceeding half a million. European countries' populations are much smaller than APAC ones; however, most of them contain rich citizens, so they can still buy a lot of things. The top three are rounded out by the US region. Although the difference in sales amounts with previous candidates is huge — more than half a million with the EU and more than a million with APAC — we should not underestimate the performance of this region. Finally, we can see that Canada is the outlier in our data, with extremely low sales. Like the US, this region consists of only 1 country, and that is probably why there is such a small value.

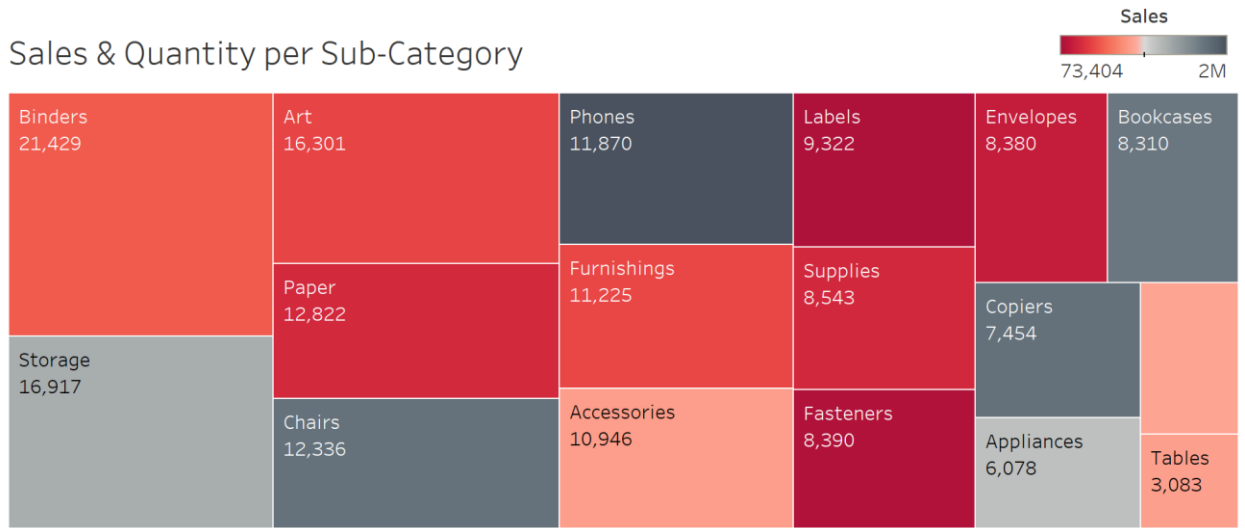


Figure 2. Tree map of sales and quantity per sub-category.

Looking at the plot in Figure 2, we can obtain even more information about sales of products of different types as well as how the revenue is connected with the quantity sold. In the left-upper corner, we have

the rectangle indicating the sub-category with the biggest quantity sold throughout the trading period: more than 21,000 binders. At the same time, the colour of the rectangle is light red, meaning that the actual sales were not big. The main possible reason is that binders are not expensive. In comparison, the phone sub-category is dark grey, and the rectangle size is smaller than that of binders and other types. This indicates that the revenue sum from selling phones is huge, even though the quantity may not be the largest. Being complex gadgets, phones are one of the most expensive items in the sub-category list; therefore, even a reduced quantity sold can bring the company good revenue. A quite similar situation is with chairs, which are bought frequently but not in very large amounts. But, they can be luxurious in the way they are made and therefore costly.

2. About Profit

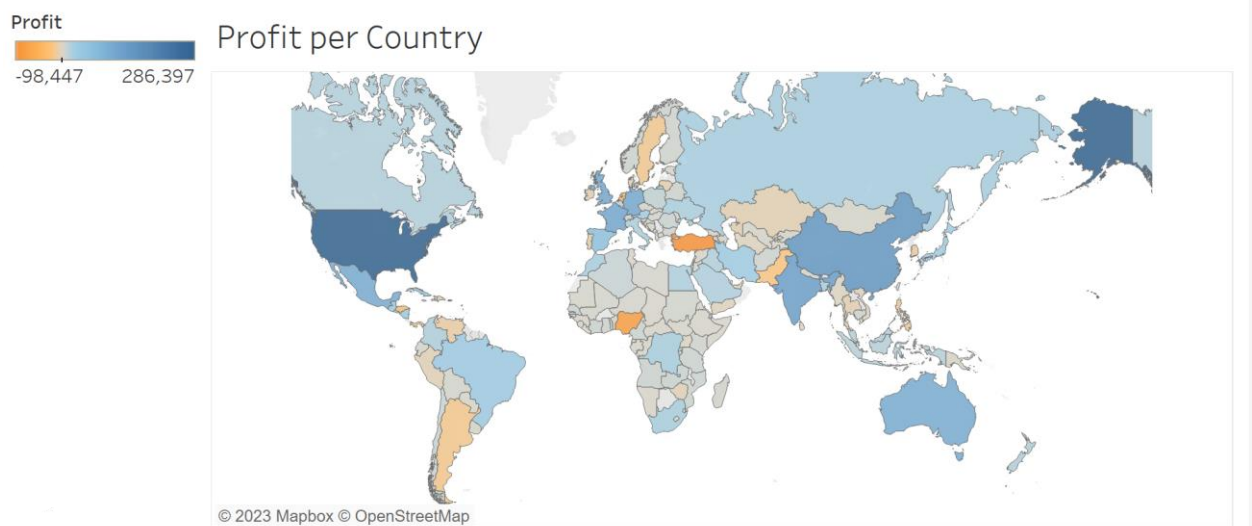


Figure 3. World map of profit per country.

Besides data on general sales, it is also vital to know how well profit is generated. Right now, let us look at the world map in Figure 3, which shows where the most of the company's money is lost and gained. From the start, we can clearly observe the countries coloured in orange. This is where sales are going so badly that the profit is negative. In Turkey, almost 100,000 units of money are lost, while in Nigeria almost 81,000. It is hard to say why; maybe there are shipment difficulties or other problems. In any case, the company should find a better way to sell in this country. Now turn to the USA, India, China, Australia, and Central Europe. Especially the first country is the most profitable overall. I assume that, since the number of items sold is generally large in the mentioned countries, the delivery system is well established and it is possible to pay for the delivery of a large number of goods at a wholesale price.

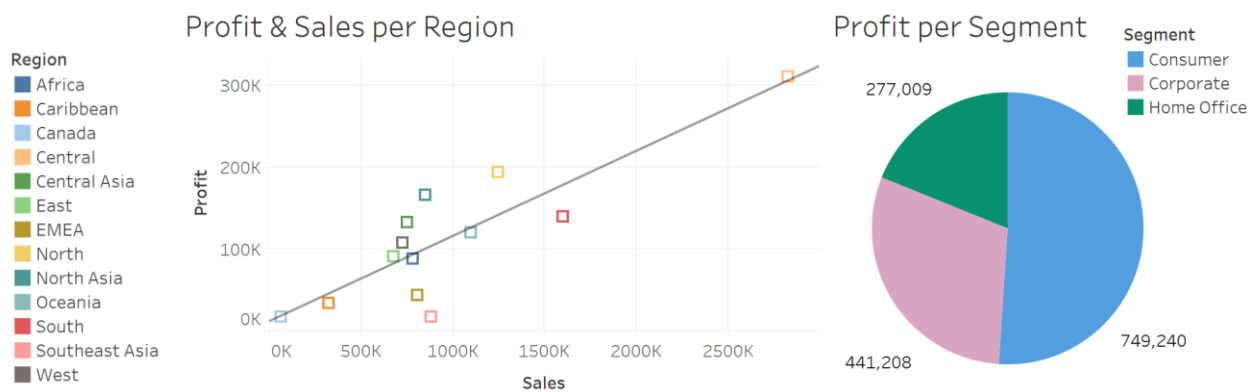


Figure 4. Scatterplot of profit and sales per region (on the left) and pie diagram of profit per segment (on the right).

We can trace a positive correlation between sales and profit on the scatterplot in Figure 4. It shows region-based information, which shows the Central region (which mostly includes the US and EU) as the owner of the highest revenue and profits. Two other leading groups, South (US, Southern EU, and Latin America) and North (Northern Europe and Latin America), show opposite performance: the first one makes great sales but smaller profit, while the second one is good in profits but least productive in sales. In my opinion, Northern region is more stable here as sales match profits better (the values are closer to each other). Therefore, the company should focus on the Southern region to improve profits.

In Figure 4, we can also observe a pie chart. This shows the profit gained from every segment where items are sold. More than 50% is occupied by the consumer segment, which is individual use sales. A little more than a quarter is taken by the corporate part. Here, I can propose wholesale purchases as the reason for lower profit because general sales values for companies must also be high.

3. Items Selling Trends

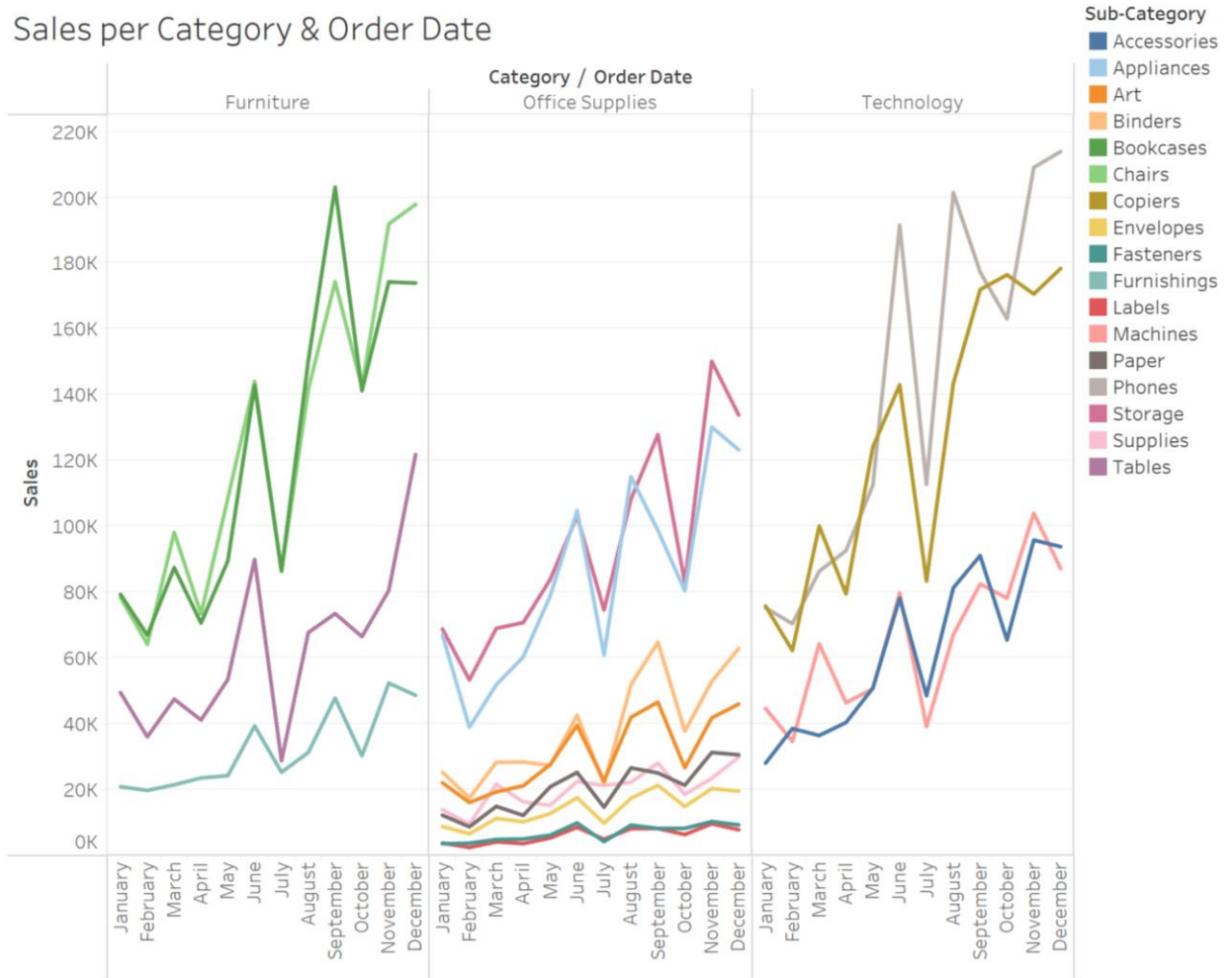


Figure 5. Multiple line graph of sales per category, sub-category and order date.

Here, I present the plot which contains a lot of information about the items sold. The measure factor is sales, whereas items are divided into categories, sub-categories and sorted by months of order. This way, it is possible to trace the changes in clients' orders throughout the year. Pay close attention to the left third of the graph, which represents the furniture category. The highest sales belong to chairs and bookcases. Interestingly, the type with the highest sales changes throughout the year: at the beginning of the year, they are pretty similar, then chairs break ahead in March and stay that way until July, when the situation changes and bookcases go up in October; after that, and until the end of the year, chairs lead again. Furnishings experience the lowest sales in this category. Moving on to the office supplies group, most of the sub-categories are lying at the bottom, all having sales close to each other and a similar trend. But there are two groups that stand out: appliances and storage. Although they also replace each other during the year, storage in 10 out of 12 months is higher. In the third category, technology, the changes between months are the most dramatic, and here we also have two outstanding sub-categories. Phones have prevailing demand most of the year, but there is an interesting

time from August to October when phones fall and copiers go up instantly. This can be connected to the fact that in August and September children go to school, so new copiers are requested.

Most subcategories have sharp jumps up and down in the charts throughout the year. This is especially evident in those who are sold more. This means there is a substantial dependence of subcategories on month. Hence, at that moment, a company can organise sales and focus mainly on those types of things that are wanted the most. Overall, we can observe positive trends for all types of items, which is undoubtedly a success.

4. Analysis of Shipping

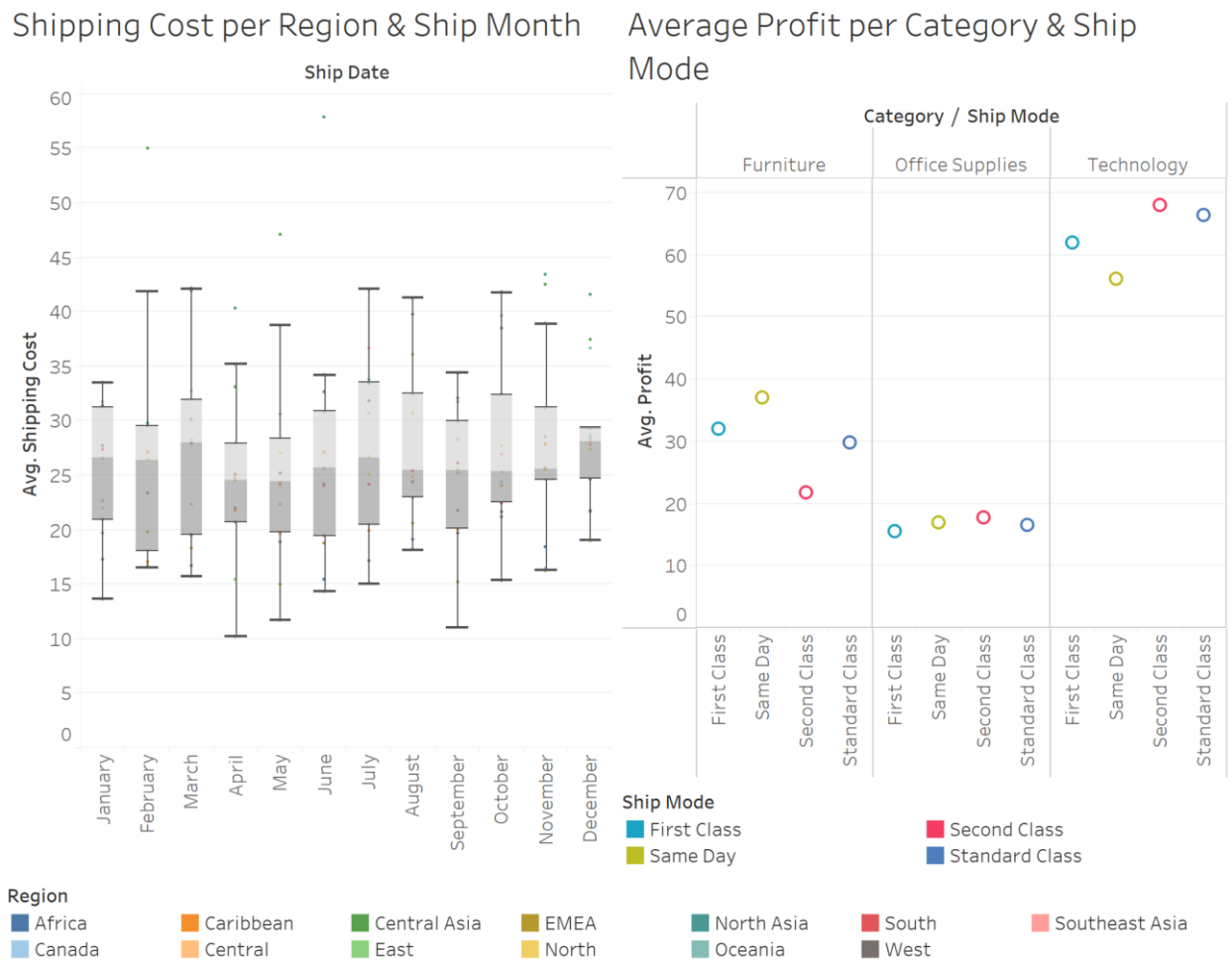


Figure 6. Boxplot with whiskers showing average shipping cost by ship month and region (on the left) and multiple circles graphs showing average profit per category and ship mode (on the right).

There are some notable features of shipping that should be considered to improve profits. Consider the box plot in Figure 6. The average cost of delivery to most of the regions is constant during the year,

except for Central Asia and North Asia, which sometimes surge unexpectedly. The smallest median cost among all regions is experienced in May, while the largest median is in December. It is proposed that in the winter the weather is unstable and it is especially hard to transfer items by sea, so the cost of shipping rises.

We can also deduce how shipping mode relates to profit. Looking at the circle graph, we see that in the furniture category, same day delivery is the most profitable, probably meaning that the revenue from selling the product pays off the cost of delivery. For office supplies, we have almost the same profit for every shipping mode, and for technology-type items, the situation is opposite to furniture: second class shipping brings in the most money, while same day shipping is the least profitable. Following this, the delivery system should be adjusted to make the fewest expenditures.

5. Future Predictions

Sales per Order Date

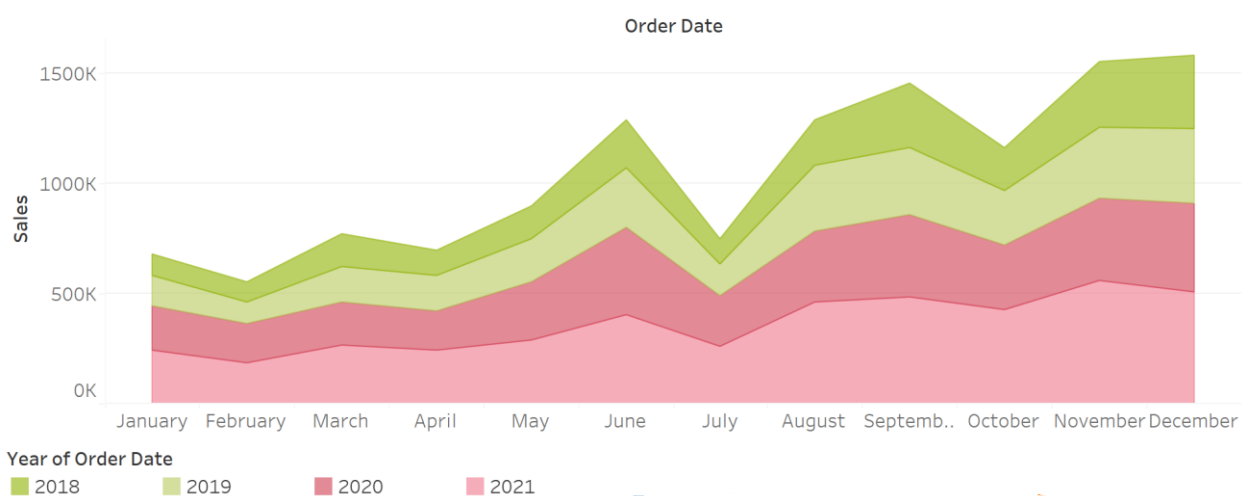


Figure 7. Area chart with sales per order month and year.

The final step in the analysis is to present future predictions based on known annual data. Firstly, we will look at the sales plot in Figure 7. During the year, we see a positive trend. In 2018, the sales value changed largely depending on the month, while towards 2021 it becomes more constant. We also can see that all sales values in every month increase with years. As of 2021, the abrupt sales gap occurs in July, which should be tackled. Overall, we see that the company flourishes, but there are still possibilities for it to become better.

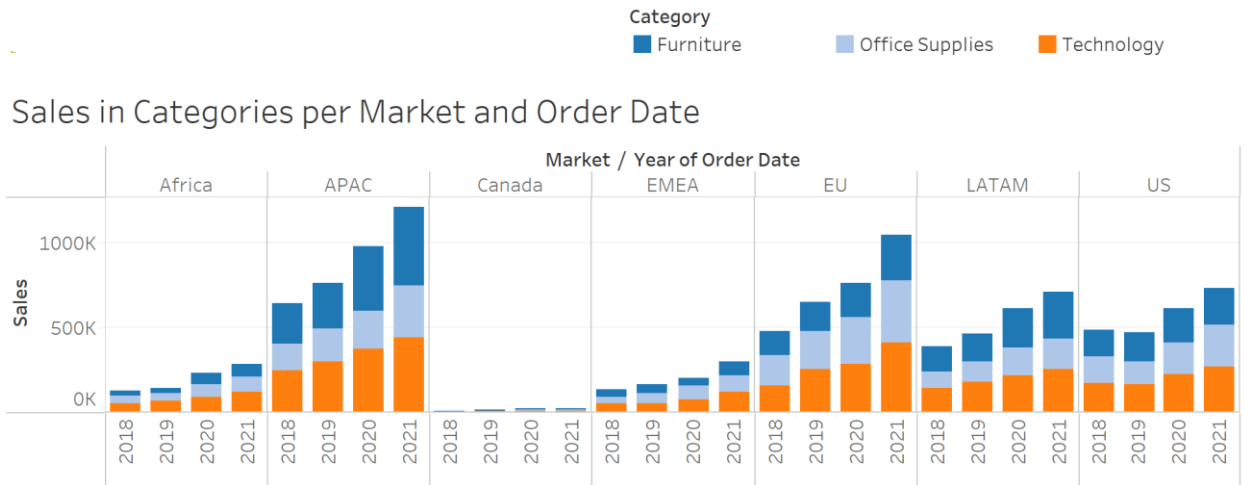


Figure 8. Multiple stacked bars with sales per market, category and order year.

We may also be interested in which categories are most popular in which markets in order to improve the effectiveness of advertising campaigns in different regions. To begin with, there is a clear upward trend everywhere (with the exception of a single outlier in the United States in 2019). In Africa, EMEA, EU, and the US, technology is popular, whereas in Latin America and Asia-Pacific, furniture has become more popular in recent years. Before, office supplies were sometimes purchased more than other categories, but now they take second place everywhere. Concluding, the strategy must be developed to sell items of a specific category at most in markets where they are demanded.

Word Count: 1487