Part A - Temporal Analysis

The temporal analysis shows key patterns in sales and profit. **Figure 1** shows a rise in sales through the year, with a low in July and a high in November and December. This is probably due to an increase in promotions during the holiday season. Profits however are almost constant throughout the year, suggesting that profit margins are lower during times of high volume. Revenue also nearly doubled in three years from 2011-2014, and year-over-year patterns show steady rise in both sales and profit through the years. However, profit increases more slowly, again indicating that other elements may have an impact on profit margins.

Figure 1 also shows that Fridays have the highest sales, and Sundays have the lowest, and on average weekdays have higher sales, indicating that it is when most customers are active. **Figure 2**'s monthly heatmap also indicates significant seasonal surges in the last few months of the year. From **Figure 3** we can see that delivery times are mostly between 2-5 days, with 4 days being the most common. **Figure 4** shows us that the fastest-growing and best-performing category of products is technology.

There are a few suggestions based on the observations from **Figures 1-4**. First, off-season revenue can be increased by running discounts during underperforming months like January through March to increase sales. This can also be applied on Sundays to utilise unused sales with targeted advertising or offers. We can also examine profitability more, to understand why profits are not growing at the same rates as sales.

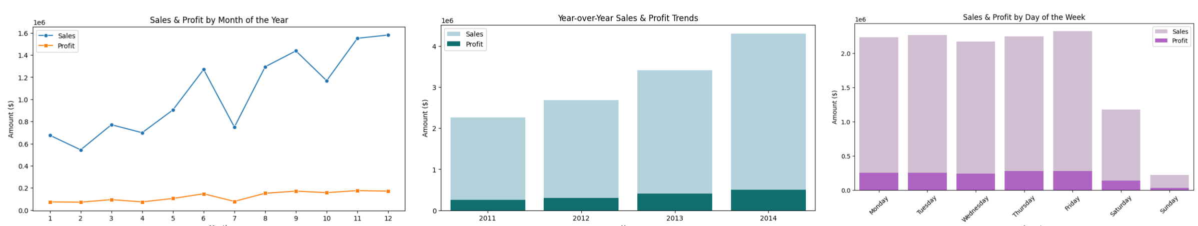

Figure 1: Sales and Profits

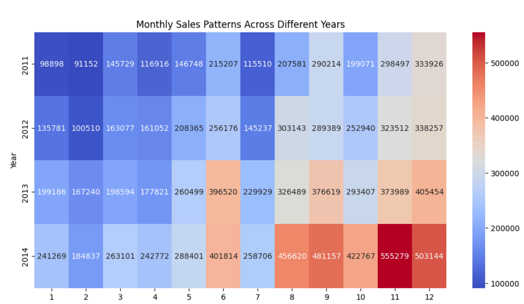

Figure 2: Heatmap of monthly sales across different years

Figure 3: relationship between order date and ship date

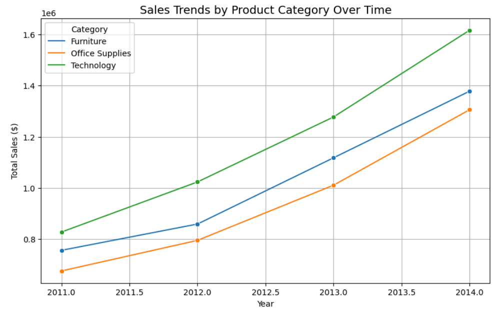

Figure 4: Sales by different product categories

Part B - Financial Analysis

The financial analysis gives us insight into the company's revenue, cost and profitability. The distribution of sales in **Figure 5** is heavily right-skewed indicating a small number of high-value transactions with the majority of them being small. The profit and profit margin distribution especially shows that many transactions are either marginally profitable or marginally unprofitable, therefore distributed evenly around 0.

The scatter plot in **Figure 6** indicated that as discounts increase, profitability reduces and also becomes negative (unprofitable). This is reinforced in **Figure 8**, where discount and profit margin have a strong negative correlation of –0.85. Similarly, **Figure 7** reveals that at lower costs there is large variance in profit and that high shipping costs have lower variance but are more likely to be associated with negative profits.

The correlation heatmap (**Figure 8**) further emphasizes that profit correlates moderately with sales (0.48) and weakly with shipping cost (0.35), while having a strong negative relationship with discounts. Additionally, **Figure 9** shows that medium-priority orders account for the highest sales and profits, while critical and low-priority orders underperform.

Therefore, based on the observations from Figure 5-9, there is a need for stricter control over discounting especially in low-margin product categories. They should also evaluate shipping efficiency to reduce variance in profit as well as avoid negative profits. Finally, reviewing order prioritization policies could help align costs with profitability.

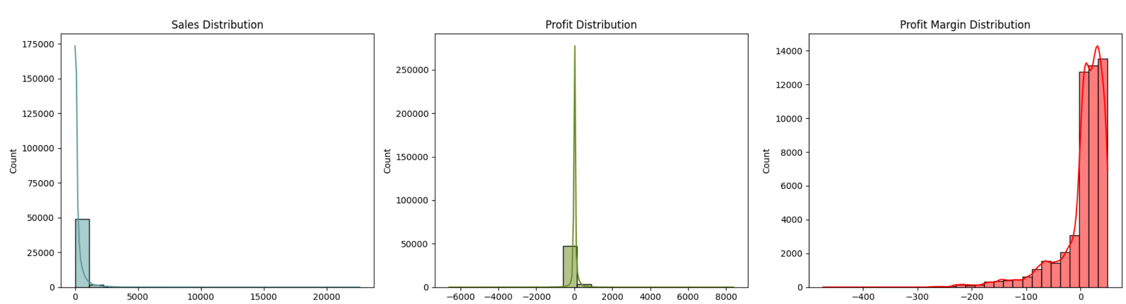

Figure 5: Distribution of sales, profits, and profit margins

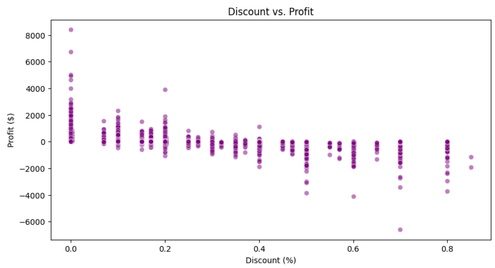

Figure 6: Relationship between Discount and Profit

Figure 7: Shipping costs and Overall Profitability

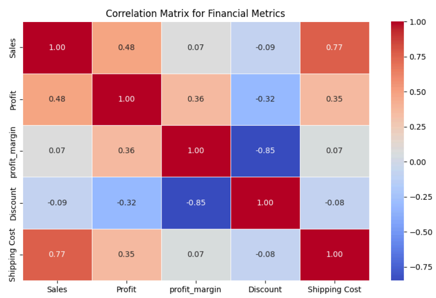

Figure 8: Correlation of financial factors and Profit

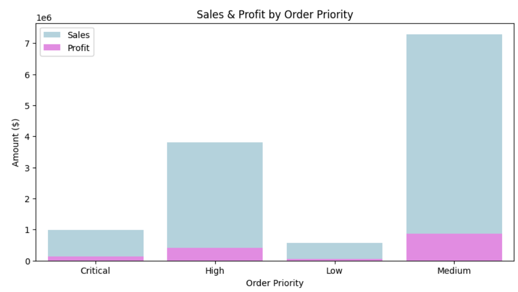

Figure 9: Sales and Profits by Order Priority

Part C - Geographical Analysis

The geographic analysis shows several regional differences in sales, profitability, product preferences, and shipping costs. **Figure 10** shows that the Central region has the highest revenue and profit and significantly outperforms all other regions, and regions like the Caribbean, and East Asia show minimal profits despite moderate sales, indicating major inefficiencies and challenges. **Figure 11** shows us that APAC and the EU are the most profitable markets, followed by the US. Whereas, Canada and EMEA have the lowest profitability, this suggests that they need changes in pricing strategies, operational efficiency, based on market due to differences in customer base value.

When examining product preferences in **Figure 12**, the Central region stands out with extremely high sales across most sub-categories, indicating that they have a large demand in all categories compared to other regions that have more niche preferences.

Figure 13 also reveals that North Asia and Central Asia have the highest average shipping costs, while EMEA, Canada, and Africa have lower shipping rates. These differences contribute to the lower profits in certain regions and suggest opportunities to optimize logistics or getting better carrier contracts.

Based on the observations from **Figure 10-13**, we can increase profits by focusing on expansion and better marketing in Central and EU regions, where profitability is already high. We can also analyse what factors are causing Canada and EMEA to have lower profits. Finally we can have region-specific inventory and marketing, allowing for better optimization.

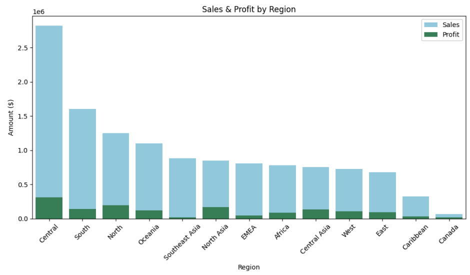

Figure 10: Sales and profits by Region

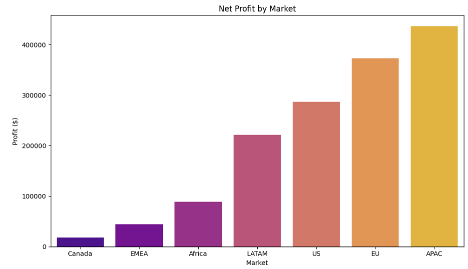

Figure 11: profitable and unprofitable markets

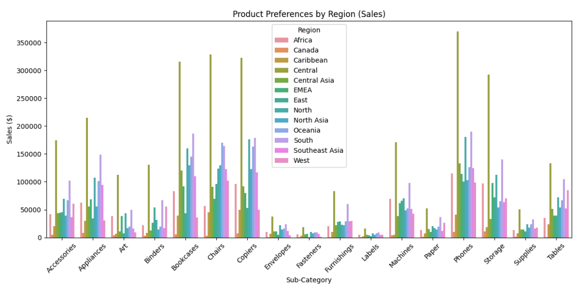

Figure 12: Product preferences by location

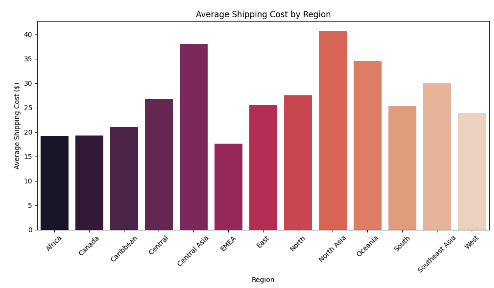

Figure 13: shipping costs by region

Product and Customer Analysis Dashboard

The product and customer analysis dashboard gives us an overview of what's affecting revenue and profitability across various categories and customer segments. **Figure 14** shows that in the Technology category, sub-categories like Phones and Copiers have the highest sales and profit. However, in the Furniture category, high sales for items do not have higher profits, indicating major cost inefficiencies and pricing gaps.

Figure 15 also reveals that Consumers account for the highest sales and profit, followed by Corporate and Home Office segments. **Figure 16** shows the 10 most profitable products, with the Canon imageCLASS Copier and Cisco Smart Phones having the highest profit. These products also have good profit margins.

Lastly, **Figure 17** reveals that Consumers are more likely to purchase Tech and Office Furniture, like Phones, Chairs, and Copiers, whereas corporate buyers evenly buy products of all types and Home Office customers tend to buy in smaller quantities and focus on the essentials.

From **Figure 14-17**, the company can improve profitability by increasing sales of high profit-margin products like copiers and phones for certain segments through marketing. Improving pricing and cost for other products with high sales such as furniture items can also increase profitability. Finally targeting marketing campaigns for home office costumes can help increase sales and profitability from this segment.

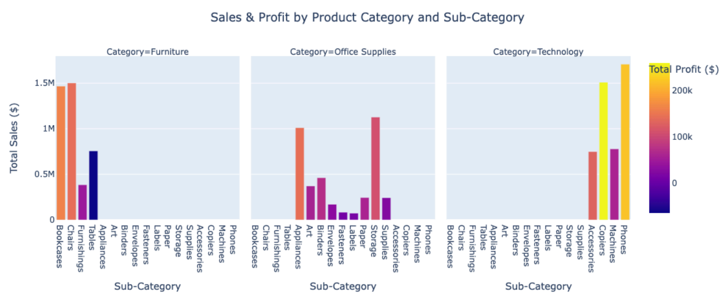

Figure 14: Sales and profits by product category and sub-category

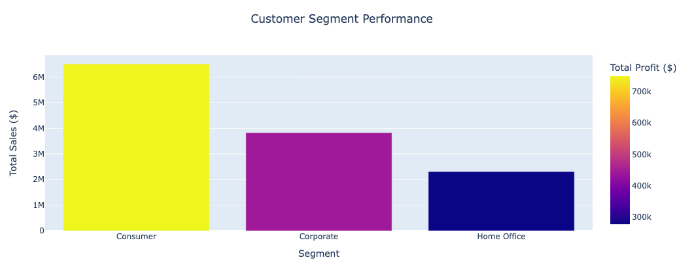

Figure 15: Profit by customer segment

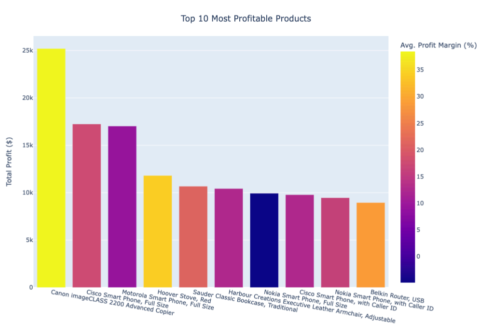

Figure 16: Profitability by product

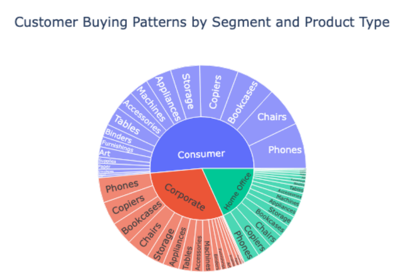

Figure 17: Customer buying patterns

Best Visualisation

The most effective visualization techniques were the stacked bar charts. Stacked bars clearly compared sales and profit in one view, making it easy to spot margin gaps across regions and categories. These were also very intuitive and helped identify actionable trends at a glance.