



Intelligent Enterprise Systems

Year 2 (2025/26), Semester 3

SCHOOL OF INFOCOMM TECHNOLOGY
Diploma in Data Science

ASSIGNMENT 2

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E-Learning

The screenshot shows the SAP Learning platform interface. At the top, there is a navigation bar with links for 'Browse', 'Get Certified', 'My Learning', and 'Subscribe'. On the right side of the header, there are icons for 'Explore SAP', a search bar, and user profile information. The main content area is titled 'My Activity' and features a 'Completed' section. This section contains a table with three rows of data:

Type	Name	Status
Course	SAP Analytics Cloud	Available
Course	Exploring SAP Analytics ...	Available
SAP Learning Journey	Designing Stories in SAP...	Available

Below the completed section, there is a large button labeled 'What do you want to learn'.

On the right side of the screen, a sidebar displays the user's profile information: 'Tan Xin Yi' and 's10267655@connect.np.edu.sg'. The sidebar also includes links for 'My Account', 'My Progress', 'My Certifications', 'Inbox', and 'Consent Management', along with a 'Log Out' button.

Introduction

This report is a data-driven business analysis based on the given SAC Retailer Dataset. I used SAP Analytics Cloud (SAC) to help create visualisations to discover actionable insights to support strategic decision-making. The visualisations could help both the Chief Executive Officer (CEO) and the Marketing Department.

The analysis investigates deeper to find patterns in product profitability, customer segments, shipping behaviour, geographic and sales trends. I made use of visualisations, smart insights, geo analytics and time-based trends.

The goal of this report is to help the CEO and Marketing Manager make data-driven decisions based on the analysis and insights I have gained and discovered. The insights aims to support strategic planning, marketing optimisation and operational improvements to increase overall business growth.

Stakeholders

Chief Executive Officer (CEO): The role of the CEO is to oversee company-wide performance, strategic planning, and profitability. They are likely to benefit from the insights across sales, profitability, customer behaviour and trends to support high-level decision making. It would help them identify opportunities for business growth and cost efficiency, bringing in more profits/revenue for the company.

Marketing Manager: The marketing manager is responsible for driving customer engagement and optimizing promotional strategies. They would benefit from insights from sales patterns, customer preferences and campaign effectiveness. The insights would help them design more targeted campaigns and improve product positioning, generating more revenue and profits for the company and ensure maximise cost effectiveness.

Exploratory Questions

1. Which sub-categories are performing best within each category?
2. Are there any specific months or quarters where sales spike?
3. Which product categories and sub-categories are most profitable?
4. Which products contribute the most to profitability?
5. Does shipping mode affect sales volume and profit margins?
6. Where are the company's top markets by revenue?
7. Which countries are performing the worst in terms of profit margins?
8. Is there a relationship between the amount of discount given and total sales per customer?
9. Which product categories have the most consistent profit margin across time?

10. Which markets and segments contribute to the most overall sales?
11. Which countries deliver the highest profit margins?
12. Which sub-categories achieve the best balance between sales and quantity?
13. Which markets and segments deliver the highest profit margins?
14. Which sub-categories bring in the most profits for Corporate customers?

Dashboard To be Made

a) Country-Level Sales & Margin Insights

6. Where are the company's top markets by revenue?
7. Which countries are performing the worst in terms of profit margins?
11. Which countries deliver the highest profit margins?

b) Product Profitability and Sales Analysis

1. Which sub-categories are performing best within each category?
3. Which product categories and sub-categories are most profitable?
4. Which products contribute the most to profitability?

c) Regional and Segment Profitability

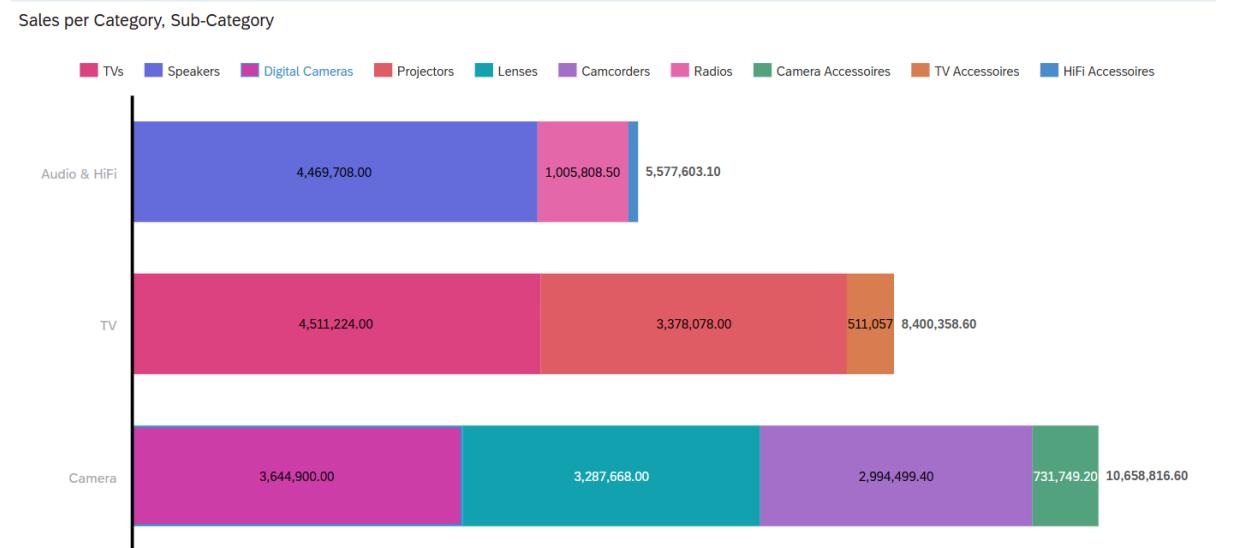
10. Which markets and segments contribute to the most overall sales?
13. Which markets and segments deliver the highest profit margins?
14. Which sub-categories bring in the most profits for Corporate customers?

d) Customer Behaviour and Sales Trends

2. Are there specific months or quarters where sales spike?
5. Does shipping mode affect sales volume and profit margins?
8. Is there a relationship between the amount of discount given and total sales per customer?

Visualizations

1. Which sub-categories are performing best within each category?



Sales Per Category and Sub-categories

This visualization shows the sales per category and sub-category. It is observed that the 'Camera' category has the most number of total sales with 10.6M sales , followed by TV with 8.4M sales and Audio & HiFi with 5.6M sales.

In the camera category, sales are well-distributed across the sub-categories of Digital Cameras, Lenses and Camcorders while Camera Accessories have lower sales. In TV category, TVs make up more than half of the sales and Projectors contribute a lot as well while Speakers dominate the Audio & HiFi category. HiFi Accessories and TV accessories contribute very little to their categories.

Using this information, the company can continue to push and prioritize items of dominating sub-categories like speakers, TVs and digital cameras as they are the strongest revenue drivers and contributes the most sales.

On the other hand, for the categories and sub-categories that are not performing as well, they could relook into their pricing strategies, product positioning, product bundling or promotional efforts to boost demand. They could also further analyse and review customer preferences or market demand.

2. Are there specific months or quarters where sales spike?

Sales per Order Date



Sales Trend Over Time

This line chart of Sales per Order Date shows the monthly sales across 2019 and 2020. It is observed that there is an upward trend from Jan 2019 to Dec 2020. In both years, the sales spikes in November and December (Q4) which is likely due to holiday shopping. The lowest sales usually occur in January and February which is in Q1. There is also a relatively large number of sales in July to September which is Q3.

Using this information, the company should plan more and larger-scale promotions for the high sales period which is Q3 and Q4. The company should leverage the high customer spending and revenue during peak demand.

On the other hand, they could try to boost sales and analyse the low-sales period like Q1. This would help to smoothen cash flow throughout the year and stabilize sales across the year.

3.Which product categories and sub-categories are most profitable?

SAC Retailer Dataset
•

Category	Sub-Category	Measures	Sales	Profit	Profit Margin (%)
Audio & HiFi	Totals		5,577,603.10	471,929.18	8.46
	HiFi Accessoires		102,086.60	4,184.49	4.10
	Radios		1,005,808.50	92,840.57	9.23
	Speakers		4,469,708.00	374,904.12	8.39
Camera	Totals		10,658,816.60	915,614.14	8.59
	Camcorders		2,994,499.40	251,117.55	8.39
	Camera Accessoires		731,749.20	65,435.05	8.94
	Digital Cameras		3,644,900.00	461,713.09	12.67
TV	Totals		8,400,358.60	817,648.93	9.73
	Projectors		3,378,078.00	365,589.32	10.82
	TV Accessoires		511,056.60	-14,307.83	-2.80
	TVs		4,511,224.00	466,367.44	10.34

Profit Margin Table of Categories and Sub categories

The Camera category leads in both sales (\$10.6M) and profits (\$915.6K), driven by high-margin digital cameras and camcorders. TVs have the highest profit margin, especially from projectors and TVs, though TV accessories are unprofitable (-2.8%). Audio & HiFi lags with lower sales (\$5.5M), profits (\$471.9K), and the lowest margin (8.46%). In it, HiFi accessories perform poorly, while speakers dominate in both sales and profits.

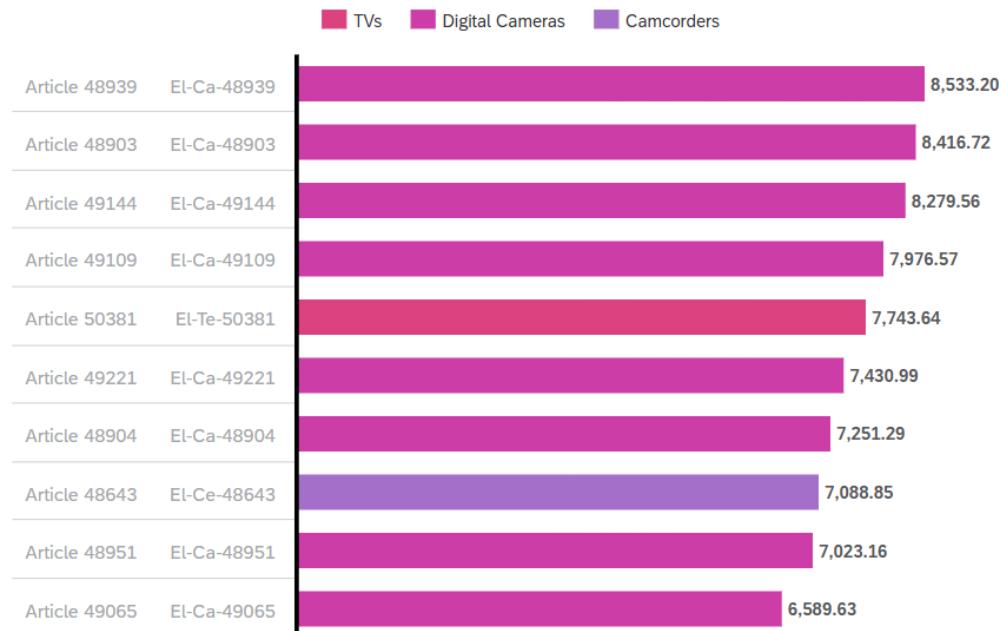
Using this information, they could invest more in sub categories with high sales and high profit margins like digital cameras, TVs and projectors.

On the other hand, they could review and reposition their products in categories that are underperforming. For example, the low sales of TV accessories could be due to it being already included for free with TV purchases, and it is less likely needed to buy it again.

Hence they should remove and stop selling TV accessories as it has a negative profit margin. The additional costs that we are losing are deducted from the operational costs. The low sales and low profit margin does not justify for its continuity to be sold

4. Which products contribute the most to profitability?

Profit per Product ID, Product Name and others



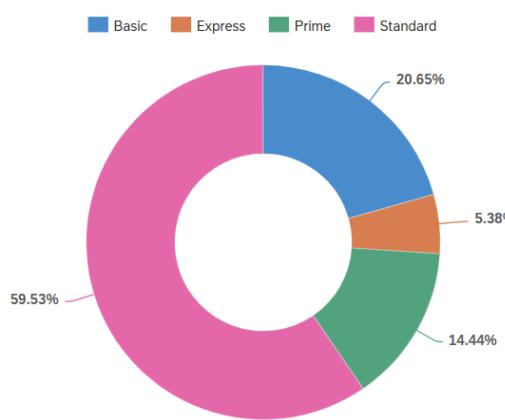
Profits per Product ID and Name (Color-coded by subcategory)

This bar chart shows the top 10 products by profit. We can observe that majority of the top 10 products by profit are part of the digital camera subcategory, and one of them being in the TV subcategory and one in camcorder. All the top-performing products generate profit above \$6.5K, and the highest being El-Ca 48939 with over \$8.5K. There is a narrow spread among the top 10, showing there is consistency in top-tier profitability.

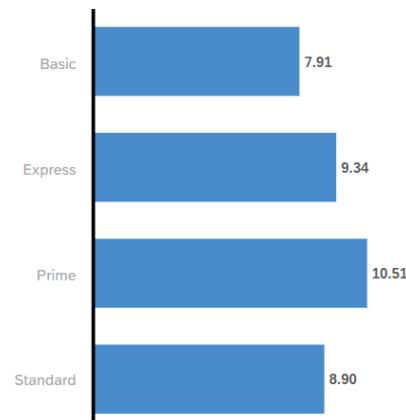
Using this information, the company could continue to allocate more resources to the high performing and profitable products. For example, they could further promote them more with advertising, seasonal promotions and bundle offers. This would help to increase and generate more revenue of the financially rewarding products , eventually earning more profit for the company.

5. Does shipping mode affect sales volume and profit margins?

Sales per Ship Mode



Profit Margin (%) per Ship Mode



Sales and Profit Margin per Ship Mode

From the graphs, 59.53% of the sales items are shipped by Standard mode followed by Basic (20.7%), Prime (14.4%) and Express (5.4%). But Prime has the highest profit margin (10.51%) and basic had the lowest. Despite high sales, Standard mode has a moderate profit margin compared to Prime and Express.

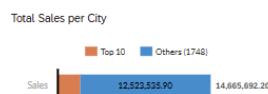
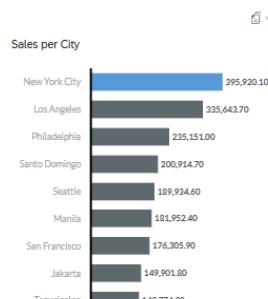
Standard and Basic are the most popular shipping methods but are not the most cost-efficient for the company.

They should encourage offering incentives to encourage customers to opt for prime shipping as it could lead to increased profits for the company.

Since Standard is preferred by customers, we could try to increase the profit margin of Standard by investigating the costs for optimization or raising the fee slightly to increase profits.

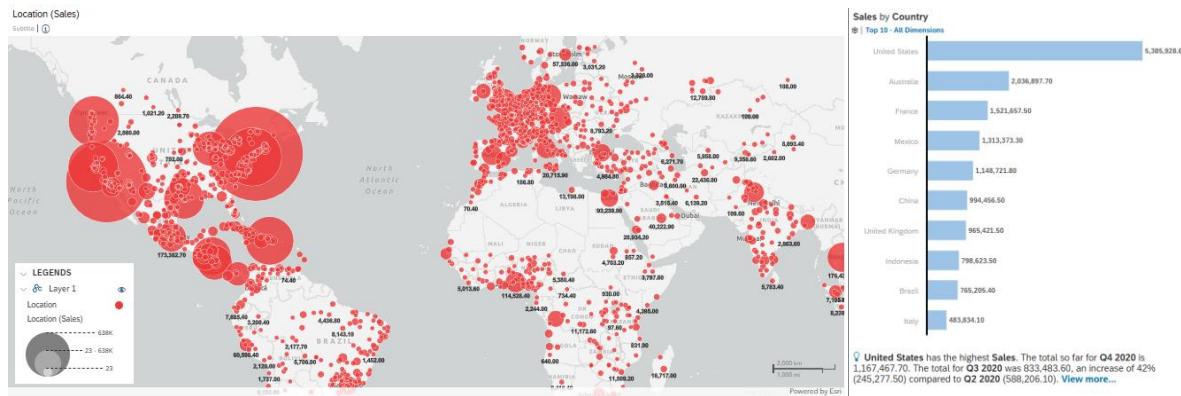
Using the smart insights feature:

New York City is the top City contributor. The top 10 values contribute 2,142,156.30 (15%) overall.



It shows how New York City has the most sales among all the cities and wins by a large margin as compared to the others. We could leverage this smart insight by trying to further promote the prime shipping in New York City. It is also likely that they will enjoy the benefits and incentives for a slight price increase as they are a city with high purchasing power.

6. Where are the company's top markets by revenue?



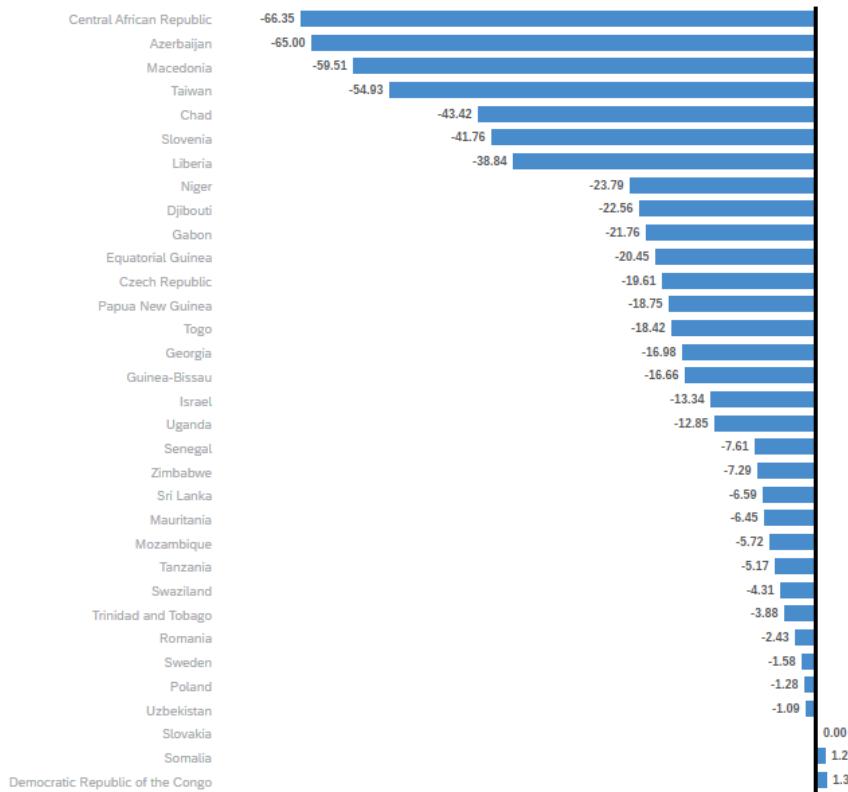
Geomap and Barchart by Sales

Both the geomap and barchart visualizes the number of sales per country. It is clearly observed from both visualizations that United States dominates and leads in sales with \$5.3M sales and is far ahead of other countries. Australia, France, Mexico and Germany are also notably strong performers, contributing over \$1M each. The geomap helps to show the cluster density like how there is heavy activity in Western Europe and North America. The smart insights of the charts by country shows that Q4 2020 has the highest sales followed by Q3 2020 which is a 42% increase compared to Q2 2020. The barchart was made using the smart discovery function available on SAC.

Using this information and insights gained from the smart insights, the company could try to allocates more resources like marketing, inventory and premium services to high performing countries like United States, Australia and France to further capitalize on their high sales. As for the mid-tier markets like Brazil, Indonesia and United Kingdom, they could try to increase sales and loyalty with targeted campaigns, localized bundles and limited-time offers. The sales by country enabled me to further discover more about the relationship between sales and market.

7. Which countries are performing the worst in terms of profit margins?

Profit Margin (%) per Country



Profit Margin (%) per Country (Descending)

This helps us identifies the loss-making countries where some having -66.35% (Central African Republic) profit margin. This means the company is losing money on sales in these unprofitable international markets.

It is important to investigate the causes of the significant losses. The company should conduct a comprehensive review of its pricing models, cost structures, and regional performance to try and reverse the negative profit margin with the adjusted sales offerings. If the return on investment of trying to reverse it is low, it is more cost-efficient to simply retract from these countries.

8. Is there a relationship between the amount of discount given and total sales per customer?

Total Discount Per Customer, Total Sales per Customer per Customer ID



Scatter plot of total discount and total sales per customer

There is a general upward trend where as discount increases, sales tend to increase as well.

Suggesting that discounts may encourage higher customer spending, but there are still many low-discount customers that generate high sales.

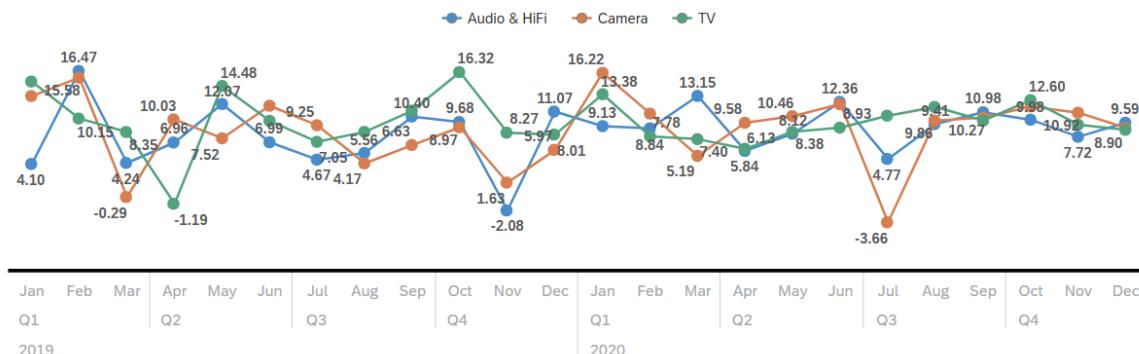
The wide scatter also suggests there is inconsistent return on discounts across the customer base.

They could offer discounts more strategically, like targeting high-volume or loyal customers instead of giving customers with low sales/quantity. They could also use personalized marketing campaigns to incentivize high-value customers like targeted offers.

They should analyze how effective discounts are for different customer segments by seeing which groups generate the most extra sales when given a discount.

9. Which product categories have the most consistent profit margin across time?

Profit Margin (%) per Category, Order Date



Profit Margin per Category by Month

From the chart, it is shown that TV(green) is the most stable as it has minor variation, almost always between 8-12%.

Camera(orange) is the most volatile and has sharp drops like -3.66% in June 2020.

Audio and HiFi(blue) has medium volatile as it drops to -2.08% in Nov 2019 but is still overall stable.

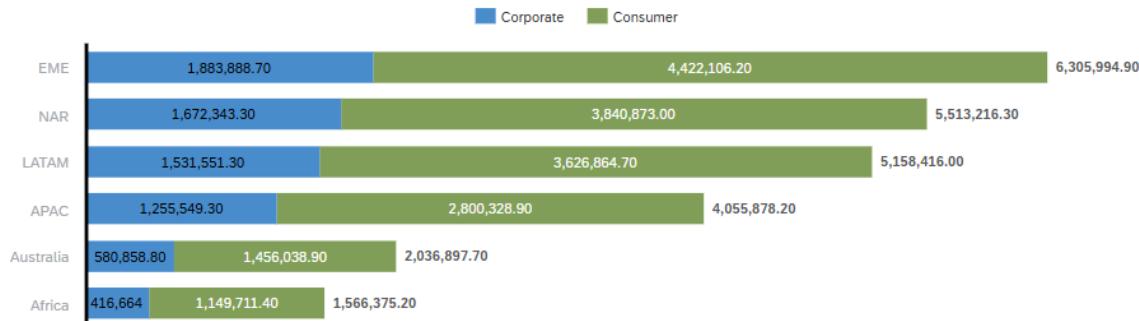
The company should try to explore expansion or bundling strategies in TVs category to capitalise on its consistency.

On the other hand, Cameras require reviewing and they should investigate the causes of the profit margin drop or the costs spikes. They should restructure its promotions and improve demand forecasting.

For Audio and HiFi, they should optimize the timing and targeting of promotions to reduced margin dips and stabilize revenue,

10. Which markets and segments contribute to the most overall sales?

Sales per Market, Segment



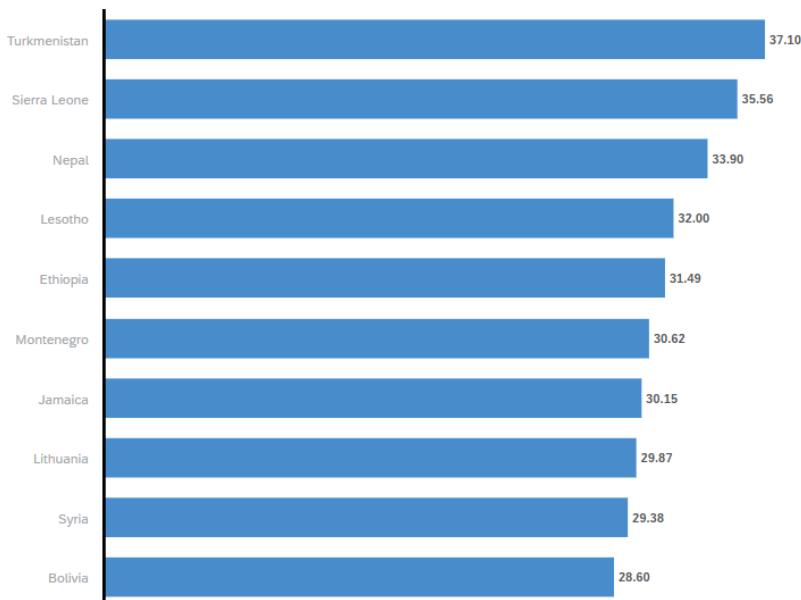
Sales per Market (And Segment)

It is shown that EME (Europe Middle East) has the highest overall sales with \$6.3M and Consumers contributing around 70%. NAR (North America Region) and LATAM (Latin America) follow closely in Revenue. Across all market, Consumers dominate in revenue and sales. This indicates that the company's core customer and revenue based are individual buyers.

The company's current offerings are well liked by consumers. Hence using this information, they could allocate more resources to target consumers in the high-revenue markets to offer promotions like bundles or loyalty programs where consumer spending is highest. With its high demand and revenue currently, it is more likely to have a higher return on investment for the company.

11. Which countries deliver the highest profit margins?

Profit Margin (%) per Country



Profit Margin (%) per Country (Top 10)

This shows the top 10 countries by profit margin with Turkmenistan leading at 37.10%, followed by Sierra Leone (35.56%) and Nepal (33.90%).

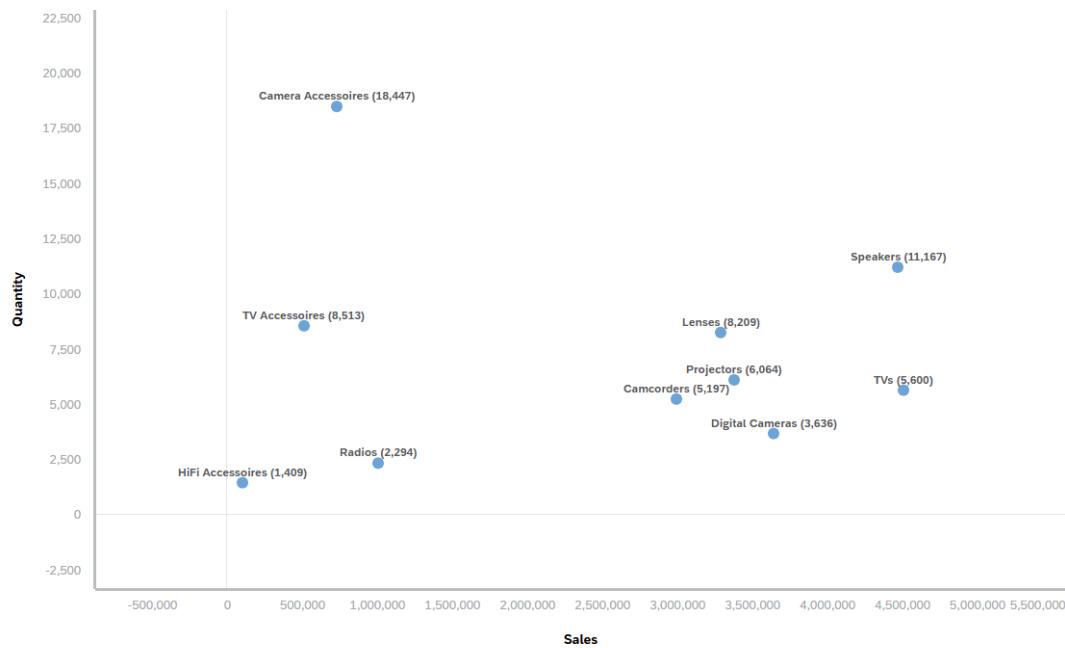
These high-profit margin countries may have lower operating or shipping costs or fewer discounts, which could have led to more profit earned.

These countries are ideal for strategic investment such as upselling campaigns and expanding product offerings to tailor to local demand. They could also introduce//encourage services like premium shipping to further boost margins.

Hence they should prioritize growth efforts in high-margin countries and evaluate what is contributing to the high profits to replicate in other markets if possible.

12. Which sub-categories achieve the best balance between sales and quantity?

Quantity, Sales per Sub-Category



Scatter plot of quantity sold against the Total sales for each subcategory

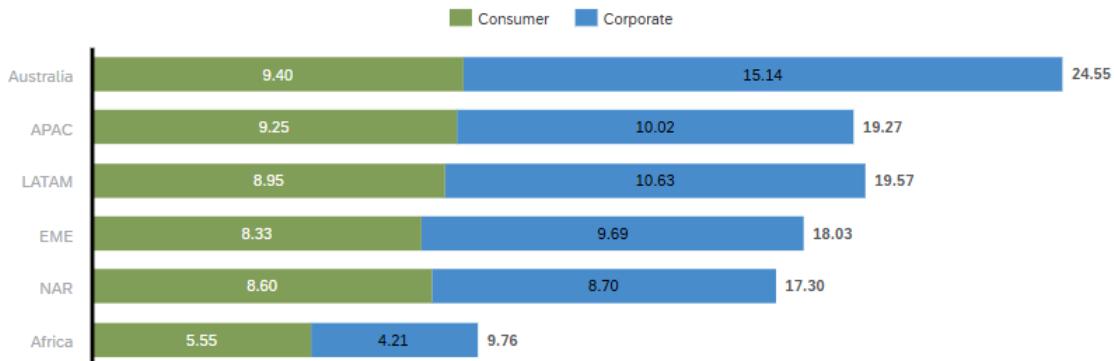
We can observe that Speakers and TVs have high sales, showing that they are the core revenue drivers with around 4.5M sales. Whereas subcategories like TG Accessories and Camera Accessories are have a large quantity sold but generate low sales/revenue.

Subcategories like Radios and HiFi accessories perform badly in both sales and quantity sold.

By leveraging the insights gained, they could repackage and include camera accessories and TV accessories into bundles. For example, pair TVs with the TV Accessories as it would help to boost the sales of both TV accessories and TVs. It would increase the perceived value of bundles.

13. Which markets and segments deliver the highest profit margins?

Profit Margin (%) per Market, Segment



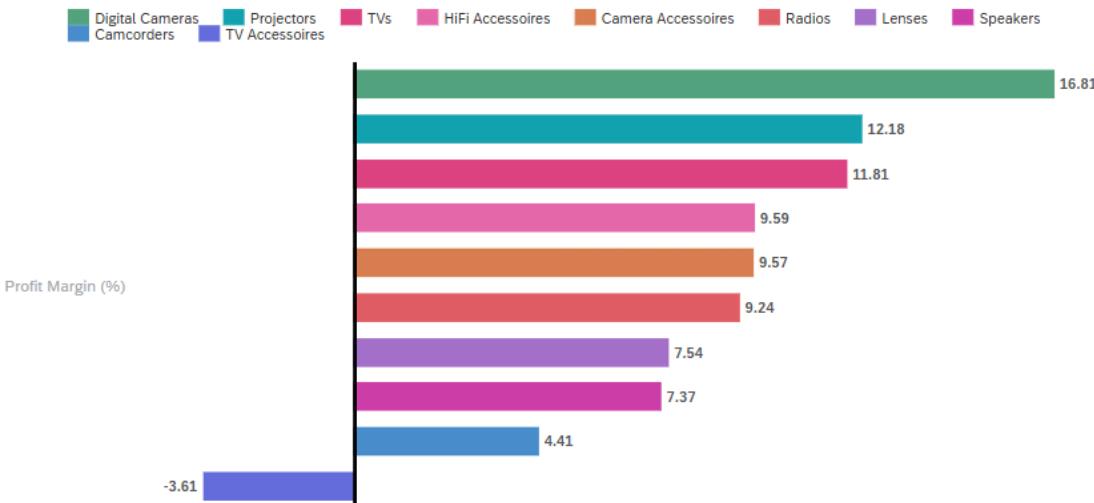
Profit Margin (%) per Market (and Segment)

This chart shows that Australia is leading in terms of overall profit margin (24.55%), followed by LATAM (19.57%) and APAC (19.27%). It shows that corporate customers contributes more in terms of profit margin across all markets (except Africa). Africa has the lowest profit margin (9.79%)

With the insights, the company should focus on investing in Corporate Australia to leverage high-margin performance. LATAM and APAC also has potential for promotions and bundling to increase its profits. They could also try to investigate some market-specific opportunities for Africa. This led me to investigate more about corporate preferences in terms of product offerings.

14. Which sub-categories bring in the most profits for Corporate customers?

Profit Margin (%) per Sub-Category (Corporate)

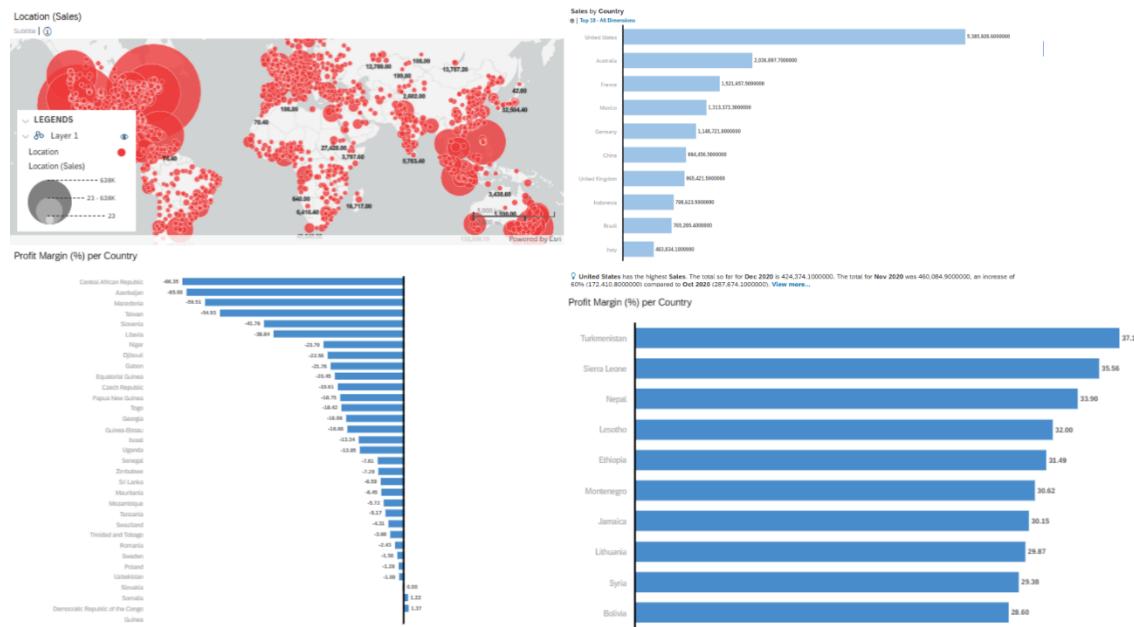


Profit Margin (%) per Sub-Category (Corporate only)

It is shown that digital cameras lead with a 16.81% profit margin followed by projectors (12.18%) and TVs (11.81%). TV accessories also have a negative profit margin of -3.61%. They should leverage high-profitable sub-categories like digital cameras with promotions and bundling to enterprise clients. On the other hand, they should try to investigate further and reverse the non-profiting TV accessories' profit margin. If the return on investment for TV accessories are low, they can consider removing it or focus on promoting it to consumers. The non-profit TV accessories are causing the company to lose money, hence important to prioritize investigation.

Dashboards

Country-Level Sales & Margin Insights



This dashboard covers the company's international sales performance and profit margins across countries. It highlights high-performing countries and loss-making countries for strategic investment and optimization.

Sales by country shows that United States lead significantly in sales (\$5.3M) followed by Australia (\$2.0M), France (\$1.5M) and Mexico (\$1.3M). The geomap also reveals dense clusters of activity in Western Europe and North America indicating regional demand concentrations.

Top profit margin countries show that countries like Turkmenistan (37.10%), Sierra Leone (25.56%) and Nepal (33.90%) have exceptionally high profit margins. These countries may have lower costs or efficient local operations, making it ideal for strategic growth.

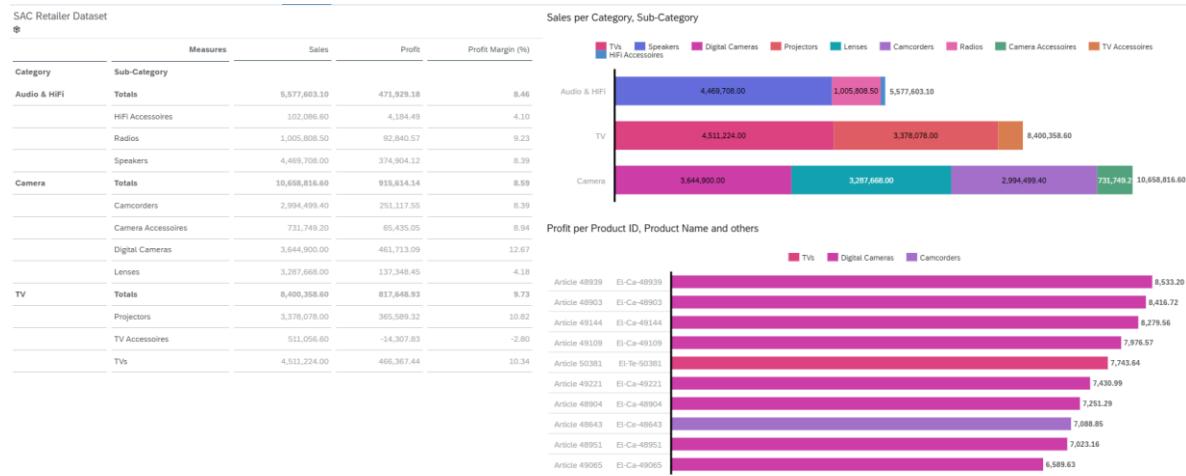
On the other hand, the lowest profit margin countries show that countries like Central African Republic (-66.35%), Azerbaijan (-65.00%) and Macedonia (-59.51%) have negative profit margins, suggesting severe losses. It could be caused by high costs or inefficient operation, making these countries unsustainable unless reversed.

Overall, the company's sales is concentrated in a few major market, with United States being the main driver of revenue. However, high sales does not equal to high profit margins where smaller countries like Turkmenistan have higher profits per sale. Some countries are also

draining resources from the company like Central African Republic and require immediate attention as the company is operating at a loss.

With the insights gained, the company should allocate more marketing and inventory resources to top selling countries like United States, Australia and France and introduce premium service or loyalty programs to further strengthen customers' loyalty and continue to increase revenue. They could also explore expanding into countries like Turkmenistan and Sierra Leone for upselling and expand product offerings to leverage their high profit margins. Furthermore, they should prioritize investigating into the loss-making markets to find out the reason and decide if it is worth continuing product offerings there based on the improvement potential.

Product Profitability and Sales Analysis



This dashboard provides a comprehensive insight into products across categories and subcategories, highlighting sales, profit and profit margins. It highlights high-performing sub-categories and categories for strategic resource allocation.

The sales insights of categories and sub-categories shows that camera category lead in sales with \$10.6M, followed by TV (\$8.4M) and Audio and HiFi (\$5.6M). Among the sub-categories, digital cameras (\$3.6M) , TVs (\$4.5M) , projectors (\$3.3M) and speakers (\$4.4M) have the highest sales. While HiFi and TV accessories perform poorly in sales.

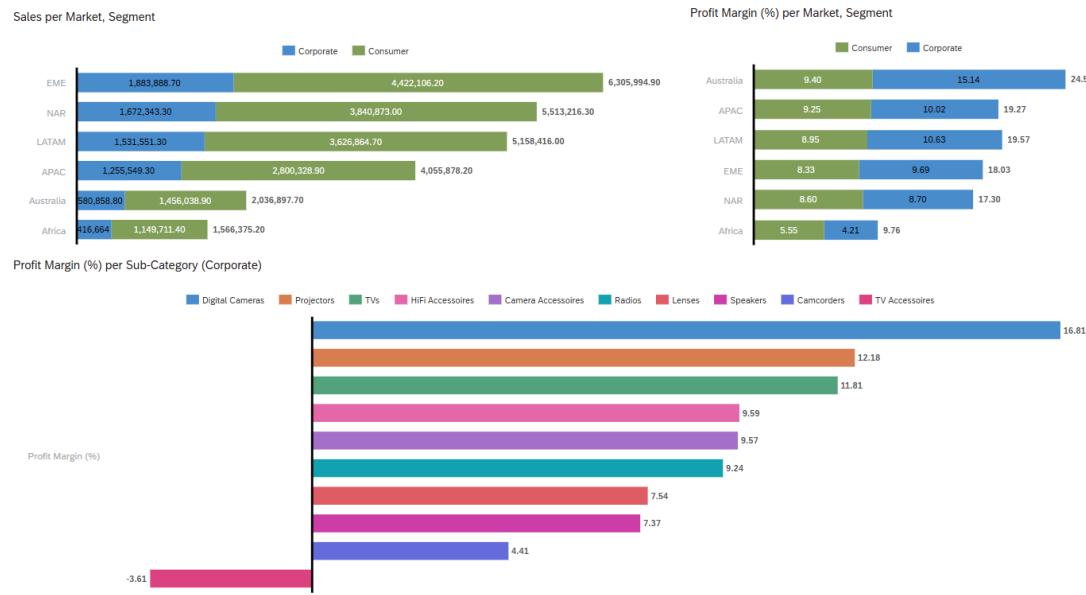
The profit margin insights table shows that profitability closely aligns with high-performing sub-categories. For example, Digital Cameras (12.67%), TVs (10.34%) and projectors (10.82%) have high profit margins. Whereas TV accessories is the only loss-making subcategory with -2.8% margin, indicating an unsustainable offering.

The products by profits shows that most of the top 10 products are digital cameras, consistently generating above \$6.5K, where El-Ca 48939 contributes the most with \$8.5K. Only 1 TV product and 1 camcorder is in the top 10, suggesting strong and stable profit contribution within the digital camera product line.

Overall, it shows that profit and revenue are concentrated in a few high-performing sub-categories especially the Camera and TV categories. However, some accessory lines are dragging down performance with low margins and low sales like TV accessories. There is also a strong consistency among high-profit products, showing that it suits the needs of the customers.

With the information gained, the company should focus on the top performing sub categories and products through more marketing and advertising like promotions or bundling with other accessories to further boost sales. They should also ensure there is enough stock to meet the high demand. They should also discontinue unprofitable products like TV accessories especially if they are already commonly bundled for free with larger purchases (e.g TVs). It is costing the company extra resources due to its negative margin. For slow-moving but relevant items like Camera Accessories, they could introduce Purchase-With-Purchase strategies to drive sales and encourage inventory turnover. Similarly, they could reevaluate their pricing strategies and product placement for the underperforming product, and should adjust their marketing strategies to improve performance.

Regional and Segment Profitability



This dashboard analyses sales and profit margin performances across different markets, segments and sub-categories to identify top-performing regions and product types for strategic focus and investment.

The sales by market and segment visualisation shows that EME (Europe-Middle East) market leads with the highest total sales (\$6.3M) followed by NAR (North America) (\$5.5M) and LATAM (\$5.1M). It also shows that consumer segment dominates revenue across all markets, indicating that individual customers are the main contributors to the company's revenue.

The profit margin by market and segment shows that Australia has the highest overall profit margin with 24.55%, followed by LATAM (19.57%) and APAC (19.27%). It also shows that the corporate segment generally outperforms consumer segment in terms of profit margin across all markets except Africa which has the lowest margin (9.76%).

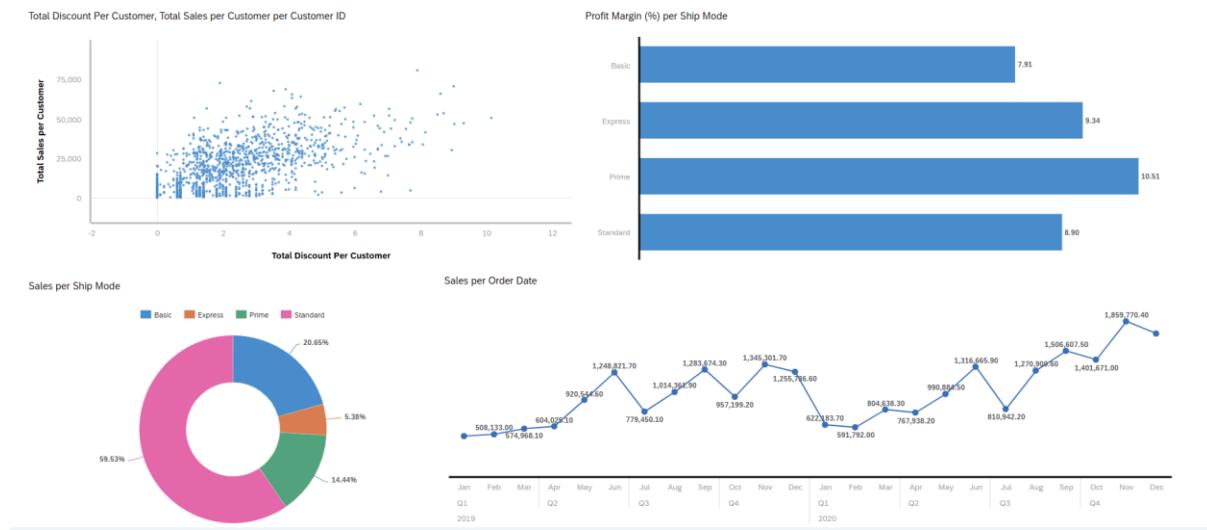
The profit margin (%) per sub-category for the corporate segment shows that digital cameras (16.81%), Projectors (12.18%) and TVs (11.81%) are the top contributors to profit margin. However, TV accessories show a negative margin of -3.61%, indicating a financial loss and needs investigation.

Overall, Corporate customers are the main contributor to profit margins especially in high-performing markets like Australia, LATAM and APAC. Consumer customers contribute significantly to sales across all regions, indicating strong product market fit for the individual

customers. The high-margin sub-categories are digital cameras while TV accessories underperforms.

With the information gained, they should allocate more resources to target the Corporate customers in Australia. With Australia's high profit margin but low sales, they should invest in marketing and increase product offering to capitalize on its strong margin performance. They can do so by trying to further promote high performing sub-categories like digital cameras (with bundles and upselling) to them since it has the highest profit margin among the corporate customers. This would overall help to generate more profit for the company. They should also investigate TV accessories' negative margin, if the ROI is too low, consider discontinuing the product line. They could also further explore growth in LATAM and APAC with moderately high margins and sales.

Customer Behaviour and Sales Trends



This dashboard uncovers insights between the relationship between discounts, shipping preferences and monthly sales trends to understand customer behaviour patterns and profit drivers.

Total sales and total discount per customer dashboard shows that there is a general upward trend where higher discounts often lead to higher sales. But there are still many low discount customers who generate high sales. The scattered pattern suggests discount effectiveness varies across customers.

The sales by shipping mode shows that Standard shipping (59.53%) is the most common method, followed by Basic (20.7%), Prime (14.4%) and Express (5.4%). This suggests that customers prefer lower-costs or default shipping methods, likely due to convenience or affordability.

The profit margin by shipping mode shows that despite its low usage, Prime shipping (10.51%) has the highest profit margin, followed by Express (9.34%), Standard (8.90%) and Basic (7.91%). This indicates that Prime and Express are more profitable for the company.

The sales trend by month shows there is a steady increase from Jan 2019 to Dec 2020, with sharp peaks in Nov and Dec (Q4) and is likely due to holiday season. July-Sep (Q3) also shows strong performances while Jan-Feb (Q1) shows low-sales.

Overall, discounts can help encourage spending but discount allocations should be reviewed to maximize ROI. Similarly, we should try to boost Prime ship mode with higher profit margins but lower usage, compared to standard with high sales but moderate profit margins.

With the insights gained, I suggest that they should optimize their discount strategy by targeting their discounts towards high-spending or loyal customers rather than applying it broadly to maximize ROI. For example, they could add tiered loyalty-based discounting. They should also encourage use of high-margin shipping modes with better marketing and advertising (like exclusive benefits or promotions) to help generate more profits by leveraging its high margin. They should also review the costs and adjust the pricing or streamline operations of the standard mode to improve its profitability without affecting customers' experience. They should also leverage high sales during Q3 and Q4 with big campaigns and further promotions while launching retention and incentive initiatives to boost performance during Q1. This would help to bring in more revenue and profits for the company, as well as stabilizing sales throughout the year, smoothing out seasonal revenue dips.

Reflection

When I first saw SAC, it felt that SAC was a very business-oriented visualisation tool for enterprise level analysis. It includes tools like smart insights and smart discovery and the experience was tailored more for creating business reports and analysis compared to exploratory analysis. There were many built-in intelligence features that was catered for business-oriented users but it is still a very powerful tool for generating insights quickly, although some of the automated insights were abit too surface-level and required further manual investigation.

I particularly enjoyed the smart discovery and smart insights features of SAC. These features enabled me to form an analysis easily as it provides me a starting point to understand the dataset/visualisation for further deeper analysis. It felt like an AI-powered business insights tool. I found the geo transform tool under datasets very useful as I did not have to manually transform the latitude and longitude into coordinates of locations. I also found the aggregation tool very useful when calculating measures because I could easily find the sum, average or even date difference without having to type formulas in. I could simply get the output I wanted by choosing the different drop downs. I also particularly enjoyed it as it helps me build dashboards and visualisations with just drag and drop, not needing to code anything.

During my hands-on experience, I had learnt a lot of things and required a lot of exploration. The LinkedIn Learning tutorials of SAC were outdated hence the user interface was different. There were many features that were relocated and took awhile to find like the smart discovery feature. I enjoyed exploring the different functions available on SAC despite its learning curve. SAC allowed for more customization like the different levels in time date data, as well as the different filters and story structure. I had also ran into problems like when I tried to calculate lead time with date difference, I saw that "Express" was negative and thought that I did something wrong. Hence it really helped me understand the dataset better that because of some orders taking 0 days to deliver with Express hence becoming negative. While working on the hands-on, creating the different visualisations helped me understand the dataset better especially the different business terms and elements like market, ISO and the different types of costs. This helped me a lot as it served as important and crucial information to give purpose to my dashboards and leverage the findings I have made based on the datasets.

I have used quite a few visualization tools before such as Tableau, PowerBI and using JupyterNotebook. PowerBI was a very user-friendly tool that is very customizable too. The user interface was rather straightforward for the visualisations and was quite simple to

navigate. But the creation of the dashboard was not as smooth as tableau or SAC where I can just drag and drop the visualisations I want. PowerBI had a website version for the dashboard. As for Tableau, I highly enjoyed using Tableau especially with the data transformation and the different charts. It was a really great tool for storytelling in my opinion. But it does not have tools that SAC offer like smart discovery and smart insights which is build-in and accessible. Tableau was more of a visualization tool made for analysis while SAC felt more focused on enterprises and businesses.

One key takeaway from the SAP and Abeam Consulting talk was how important communication between stakeholders is to ensure a project is successful. Effective communication goes beyond sharing updates but also involves building trust and encouraging feedback. I also learnt more about Abeam's approach using the SAP activate methodology like how they have phases like Prepare, Explore, Realize, Deploy and Run. By understanding the importance of how we need to tailor our communication to the different stakeholders needs like using different documenting progress, helped me see how communication directly affects the project outcomes.

In IES, I have learnt plenty about how the business world operates. I learned more about the different business terms and how to make use of popular enterprise softwares such as SAP and SAC. I also learnt what the different roles do like CEO, accounting team and inventory team do. It is very useful as they are tools that we would have to eventually make use of if we enter the business industry which is rather likely with business analyst being one of our job prospects. SAP and SAC are also widely used in the industry too hence it would eventually be beneficial to me by learning how to use them. In IES in general, I have learnt plenty about the different business workflows and how the different stakeholders link to one another. For example, how the purchasing department needs to create a purchase order and get quotations. It is more than just purchasing and receiving a product/service, it requires different stakeholders that have different roles to play just to accomplish such a deceptively 'simple' task.

During the module, what surprised me was how interlinked data and business was. Without data, the business is likely to fail as they are not able to analyse more about where they are performing well and badly, unable to know how to improve or further expand. It also really surprised me how each step of purchasing an item can be so complicated and interlinked. I used to think it was just buying one item and sending out goods followed by a receipt.

If I could redo the practicals, I would have tried harder to link what I was doing to the theory I have learnt in class. It would have helped me deeply understand what I was doing and whose role I was playing. I would honestly have tried to also pay more attention during the e-learning part of learning SAC. If I did, I would not have ran into so many issues like not knowing how to use certain functions which eventually led me to researching on youtube/online for tutorials. I would also try to use more calculated measures and dimensions to uncover deeper insights for SAC since I was not very familiar with the tool.

A step-by-step walkthrough video or tutorial for the updated SAC interface and navigation would have helped improve my learning process. As mentioned, SAC and SAP has a very steep learning curve. Despite given linkedin videos to teach us how to make use of the platforms, I feel that with a more indepth video, and using the updated platform would have made this assignment smoother and more efficient to complete. A cheat sheet of the different types of charts and their differences like pros and cons would also have been very useful. When creating charts, I had to think about what to put and visualize them. Like when I want to compare quantity and sales, I can not just put it in a bar chart since they are both measures, hence I had to reconsider and put them in a scatter plot. It also made me consider the difference between line charts and bar charts, and weigh the pros and cons of each. Hence having a cheat sheet would have been really effective and helpful when making the different charts.

The smart discovery feature linked closely to deep learning and machine learning as it makes use of large language models to predict and analyse the charts. We learn how to make these models in machine and deep learning. It also relates to data wrangling as data wrangling is crucial when trying to make visualisations and analysis. Without it, it would have been hard to work with the data set.

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