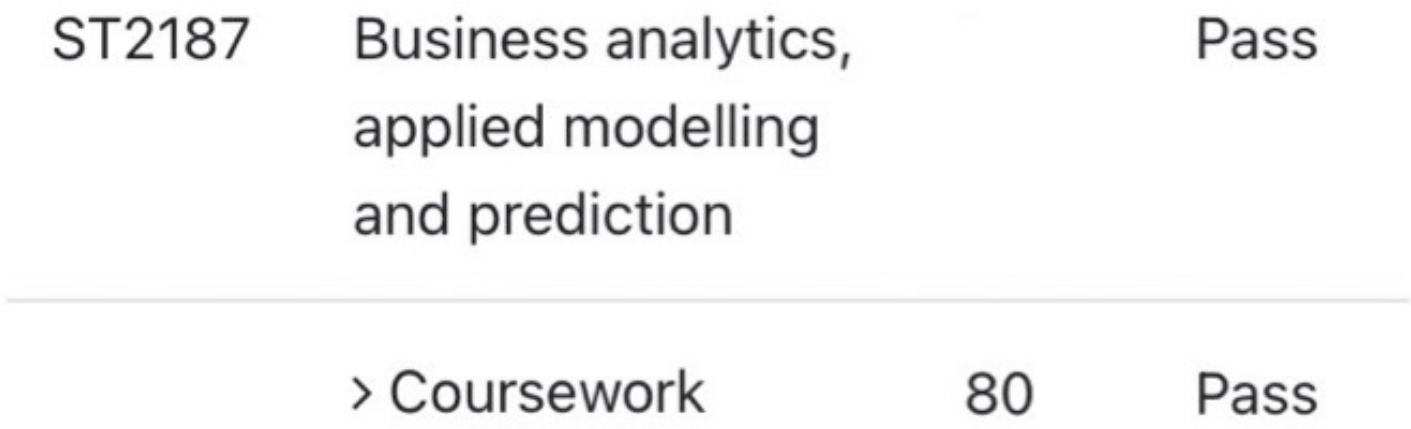
ST2187

Business Analytics, Applied modelling & Prediction

Hi ☺️

Please take note that the following report is only for your reference. It can be used as a guideline on how your report should look. Please DO NOT copy word for word as you will be caught for plagiarism as you are required to send your coursework through a plagiarism checker when submitting to UOL.

This report was submitted on 1 March 2021 which scored an 80.



5.6 ST2187 Business analytics, applied modelling and prediction

Due date: 1 March

This course has a 30 per cent-weighted coursework component which will require you to use Tableau to create a story (a collection of dashboards) to discover commercial insights from a provided dataset. The purpose of the project is for you to demonstrate your ability to create effective data visualisations using Tableau to communicate key insights to senior management. This individual project work is treated as an open-book examination.

The dataset will be provided on the VLE, and it will contain multiple variables – some will be categorical (or 'dimensions' in Tableau) with others being measurable ('measures' in Tableau). You will be permitted to create new variables from existing ones, provided it makes sense to do so.

Screencasts of how to build visualisations in worksheets, and subsequently the creation of dashboards and the story will accompany the release of the dataset.

Your task will be to explore the dataset using Tableau's data visualisation tools in an effort to extract commercially-important insights in preparation for a presentation of your findings to senior management of the company.

The deliverable content will be in two parts:

- a story (a collection of **five** dashboards) created in Tableau
- an accompanying 1,500-word report, which describes the key insights from the story, including recommendations to senior management as a result of your discoveries.

Which visualisations and which variables you wish to explore will be depend on your judgement. The task is designed to simulate real-life situations when business analysts are faced with raw data and need to spend time exploring, or mining, the dataset hoping to discover interesting trends, patterns and relationships.

Marks will be awarded on the basis of the following:

- How clear your dashboards are, i.e. how effective your chosen visualisations are at showing the insights.
- Creativity and imagination in your choice of visualisations.
- The quality and professionalism of the story.
- How well the accompanying report relates to the Tableau story, i.e. the reader of the report and story should be clear on the findings in the same way as if the reader had attended a verbal presentation of the story. (You will **not** actually be delivering a presentation to an audience.)
- The relevance of the recommendations to senior management contained within the report.
- The quality and professionalism of the story and report.

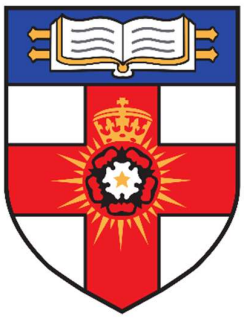
The length of the report should not exceed 1,500 words. You should also include an executive summary at the beginning of no more than one side of A4. Please also include a table of contents. The executive summary and table of contents are **not** included in the 1,500-word limit.

Please note there is no allowance in the word limit. If you exceed the stated word limit you will be penalised. Please also state the word count.

If you wish, you may also include a Technical Appendix at the end of the document (excluded from the word count) but the Examiners will **not** consider anything included here for marking.

The text should be spaced using the 1.5 lines setting and you should use the 'Calibri' font, sized 11. The word limit does not apply to text not in the main body such as footnotes and labels.

All submissions will be checked using the anti-plagiarism software TurnItIn. Any duplicated text which is not adequately cited will be deemed to constitute plagiarism and proportional penalties will be applied during marking.



UNIVERSITY

OF LONDON

BUSINESS ANALYSIS REPORT

Tableau Visualisations

Prepared for
University of London
Senior Management

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(SIM)

In partial fulfilment of the requirements for the module,

Business Analytics, Applied modelling & Prediction [ST2187]

Submission Date: 1 March 2021

Word Count*: 1499/1500

*(excluding Table of Contents & Executive Summary)

Table of Contents

Table of Figures

Executive Summary

With the dataset provided, we will be using the Tableau's data visualisation tools to analyse commercially important insights to discover trends, patterns and relationships that hopefully can help increase our sales.

The following lists the visualisation tools that we have used in Tableau to support our analysis:

1. Area Graph
2. Bar Chart
3. Maps
4. Packed Bubbles
5. Pie Chart
6. Scatter Plot
7. Treemap

For the story, we have created interactive dashboards to highlight the relationships by moving your cursor and hover at the section you want to view; Tableau will instinctively highlight the related sections.

1 Introduction

1.1 Background

As business analysts, we have been provided with four years' worth of dataset on our consumers' details from 1 January 2011 to 31 December 2014[1] with 51,290 rows of value.

1.2 Changes & Assumptions

To prevent any confusion, we have assumed and renamed "Sales" to "Revenue" and "Profits" to "Gross Profits". Hence, with this assumption we can calculate the Gross Profits Margin.

1.3 Scope

The following business analysis report discusses the visualisation tools used to identify the key insights and our recommendations to senior management.

2 Methodology

2.1 Purpose of Report

We hope that this report will effectively show our business progress in these four years and encourage the senior management to make informed decisions based on the factual evidence of the trends and relationships analysed in this report.

2.2 Approach

We will use the various Tableau visualisation tools to analyse any significant trends or relationships across the quantitative and qualitative data.

[1] Time-window based on the Provided Order Dates

3 Dashboard Observations

3.1 Dashboard 2: Total Revenue Overview

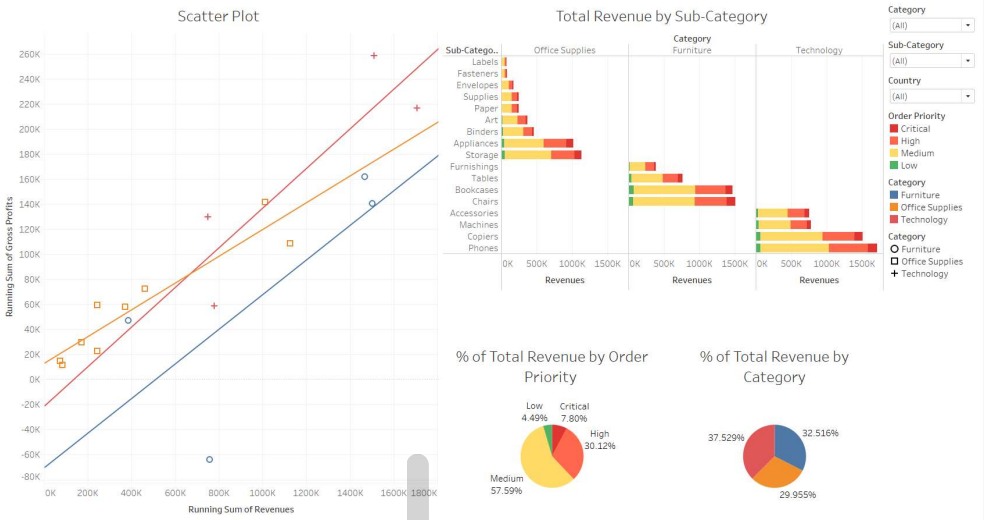

Figure 1: Dashboard 2 (Total Revenue Overview)

Observations:

1. Scatter Plot – technology has the steepest slope out of the three Trend Lines meaning it has both the highest Sum of Gross Profits and Revenues. This goes to show that we can sell our products under the Technology Category relatively well.
2. Bar Chart – We can see the Total Revenue for all 4 Sub-Categories under Technology is the highest as the sum of the bar lengths that shows each Sub-Categories Revenue is the longest. Matching the observation, we have concurred in the scatter plot. By including the Order Priority colour details, we can conclude that the Medium priority has the highest Total Revenue due to the sum of the yellow shaded areas whereas the Low priority has the lowest Total Revenue as the green shaded area are so minute.
3. Pie Chart by Order Priority – We can see that Medium priority has the highest % of Total Revenue is the highest, 57.59% while Low Priority with 4.49% yielding the least Total Revenue. Matching the observation, we concluded above under the bar chart.
4. Pie Chart by Category – Technology being the largest area in the pie chart with 37.529% meaning it yields the most Revenue matching what we identified through the trend line in the scatter plot.

3.2 Dashboard 3: Total Revenue & Gross Profit Global Representation

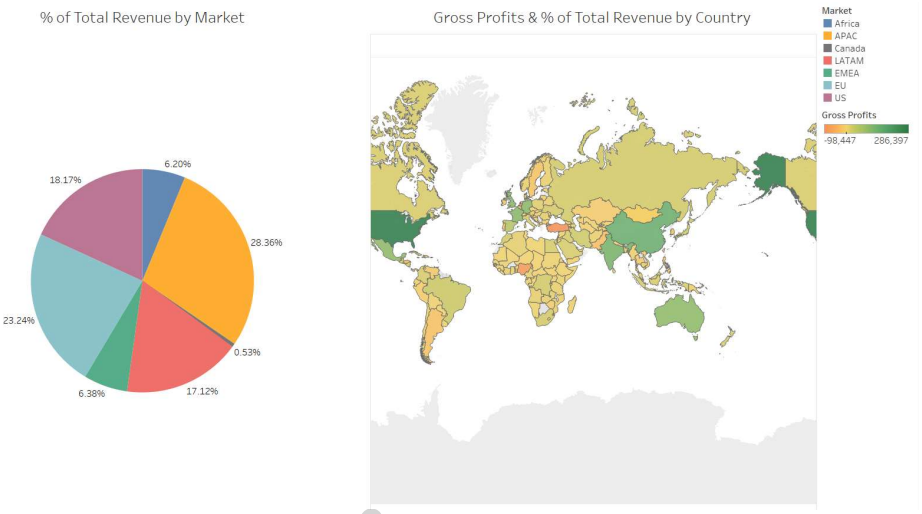

Figure 2: Dashboard 3 (Total Revenue & Gross Profit Global Representation)

Observations:

1. Pie chart – this shows the Total Revenue is the highest in the APAC Market which is 28.36% of the total. While Canada Market has the least Total Revenue being only 0.53% of the total.

2. Map – We can easily see US has the highest Gross Profits as most of the areas are shaded dark green. In Turkey and Nigeria, we can see the prominent red is darkest in these areas meaning we are not doing very well in these countries, as we are incurring losses.

3.3 Dashboard 4: Gross Profits Overview

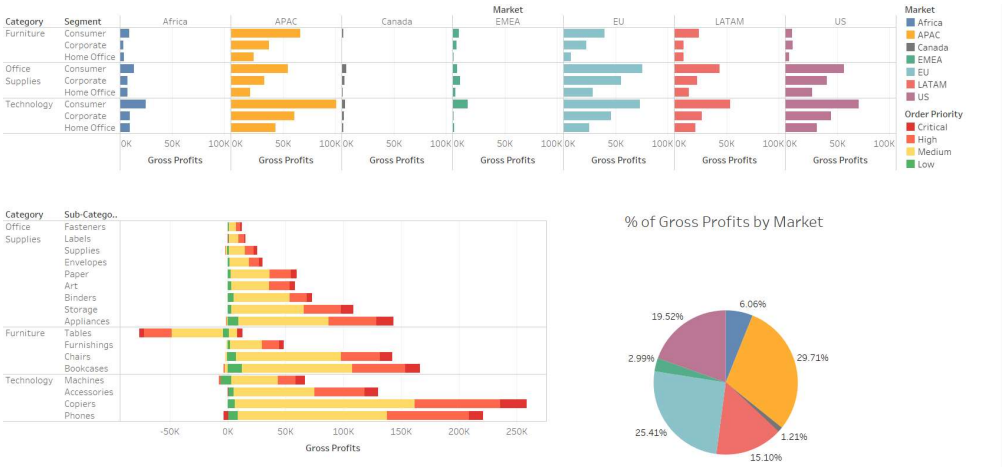

Figure 3: Dashboard 4 (Gross Profit Overview)

Observations:

1. By the Market's colour – Canada has the least total amount of shaded area in the whole chart it shows that our Total Gross Profit for Canada is very low. While APAC has the most total amount of shaded area in the whole chart showing our Total Gross Profits are the highest.

2. By the Segment, we can also see that Consumer has the most shaded area meaning most of our customers are buying under the Consumer Segment. The Furniture Category has the lowest Total Gross Profits while Technology is the highest.

3. By Order Priority's colour – it's very prominent that Tables is incurring a huge loss as the Total Gross Profits don't even begin to cover the losses. Whereas Copiers yields the most profits as the bar length is the longest. The yellow shaded area is the most showing that most of our profits are from the medium priority as stated above.

3.4 Dashboard 5: Geographical Overview

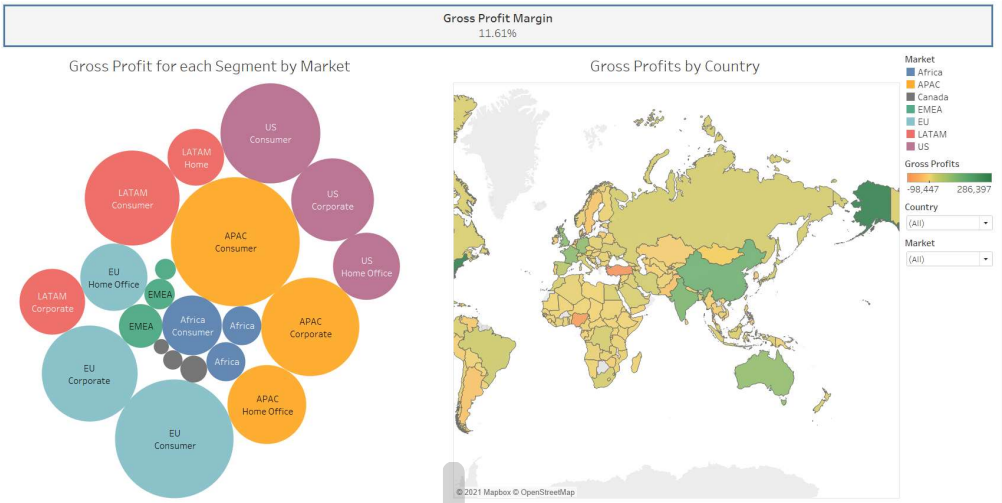

Figure 4: Dashboard 5 (Geographical Overview)

Observations:

1. Our Total Gross Profit Margin is 11.61% which is relatively low.
2. Size of the bubbles show the Gross Profits and most of the bigger circles are under the Consumer Segment showing Consumer Gross Profit is high.
3. Colours of the bubbles show the Market's profit.

4 Insights (Story)

4.1 Shipping Costs Overview

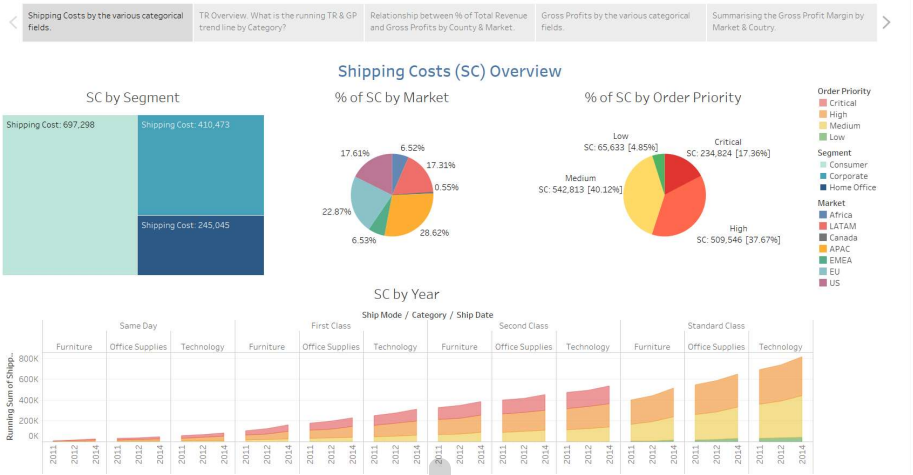

Figure 5: Dashboard 1 (Shipping Costs Overview)

We are starting the story with a summary on the Shipping Costs by the various categorical fields.

1. Treemap - Shipping Costs for each segment, size representing Total Shipping Costs and we can see the largest square being the consumer's segment meaning most of the Shipping Costs are derived from customers buying for consumer purposes.
2. Pie Chart (% of SC by Market) – shows the percentage of Shipping Costs spent for each Market. Highest expenditure on Shipping Costs from the APAC market (28.62%) while the Canada market with the least (0.55%).
3. Pie Chart (% of SC by Order Priority) – Shows the Shipping Costs by the Order Priority where the Medium is the highest[2] From the initial analysis, above under section 3.2 it matches the fact that Medium priority is sought-after by our customers. Whereas the low, Order Priority costs much lesser only occupying 4.85% of Shipping Costs. If we want to minimise the amount spent on Shipping Costs, we should consider requiring customers to bear more costs especially for Medium priority to discourage our customers to choose it to create more demand for the other level of priority.
4. Area Graph – Medium, Order Priority with the biggest area matching our inferences stated above. Shipping Costs spent on the "Same Day" Shipping Mode being lowest means our products are considered unessential by our customers as it does not create their urgency to receive it immediately.

[2] 40.12% of Shipping Cost spend on shipping by Medium Priority.

4.2 Total Revenue Overview

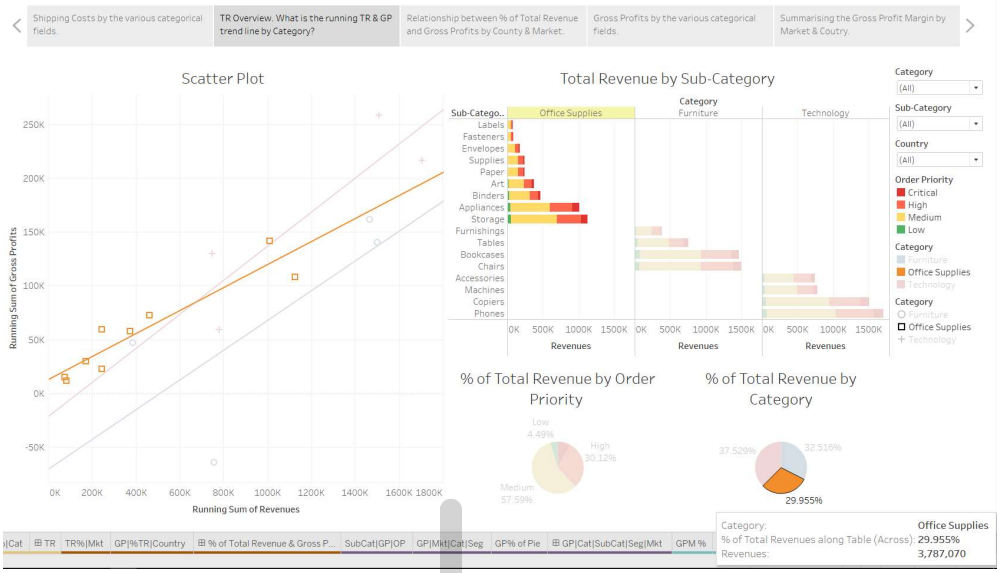

Figure 6: Total Revenue Overview

Here, we have created an interactive dashboard as shown in the above Figure 6 , as you hover along the section for Office Supplies[3]:

Firstly, by the tooltip it shows the % of Total Revenue from Office Supplies being 29.955% (yielding the least revenue by Category) and Total Revenue for the four years being 3,787,070.

Additionally, it will highlight the related Trend Line in the scatter plot by moving our cursor to the Trend Line it will show the equation Y^{4} = 0.106867 X^{5} + 12640, R^2 = 0.873969 (relatively large positive linear association) and P value of 0.0002178.

The bar chart is also highlighted by the Sub-Category items that are under the Office Supplies category, so we can easily see which items belonging to the Office Supplies' Sub-Category has the highest Revenues. In this case, we can see that "Storage" yields the highest Revenues. From the bar chart, we can see the area of yellow bars are the largest too which matches the analysis that Medium, Order Priority yields the most Revenues.

[3] This will work for the other 2 Categories as well; it will highlight the related areas on the trend line and the bar chart.

[4] Running Sum of Gross Profits (Y-axis also the dependent variable)

[5] Running Sum of Revenues (X-axis also the independent variable)

4.3 % of Total Revenue & Gross Profits Global Representation

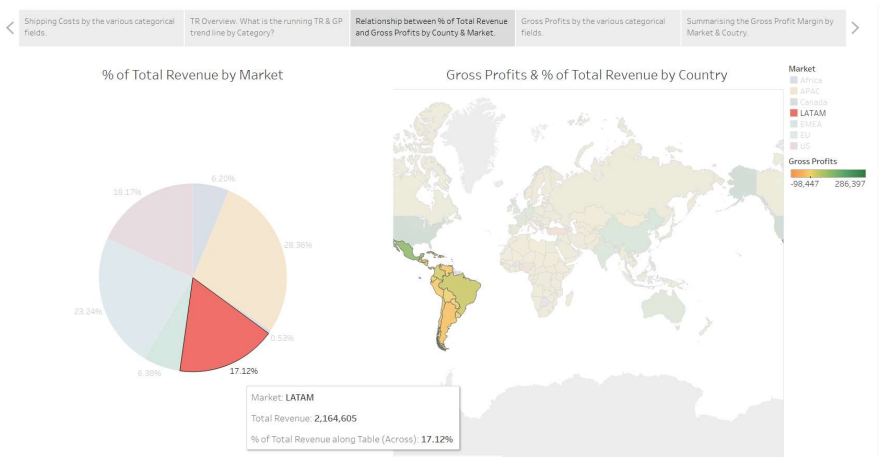

Figure 7: Relationship between Total Revenue and Gross Profit (Pie Chart as Source Sheet)

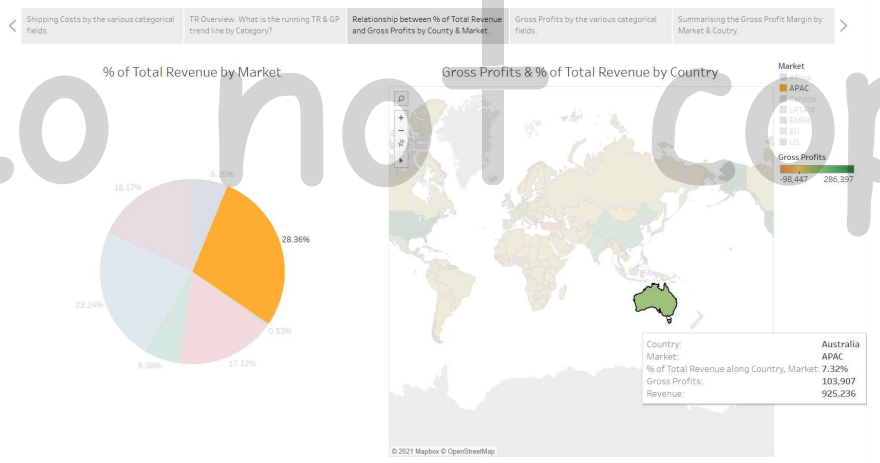

Figure 8: (Map as Source Sheet)

<u>Observations:</u>

Under the LATAM Market (shown in Figure 7), despite Total Revenue being relatively high some countries yield positive Gross Profits while others negative. Showing that high revenue doesn't necessarily mean we are earning profits.

As presented in Figure 8; in Australia, it yields 7.32% : 28.36% of the Total Revenue for APAC (in percentage). Knowing which Countries' Gross Profits are positive which also contributes most to the Total Revenue by Market, we can focus[6] on reaching out to potential customers in these countries to hopefully increase both Revenues and Gross Profits successfully. For example, in US, China, France and Germany just to name a few.

[6] We can research and explore what can be done to attract these customers by finding out any product, promotions or price preferences that can increase their consumptions.

4.4 Gross Profits Overview

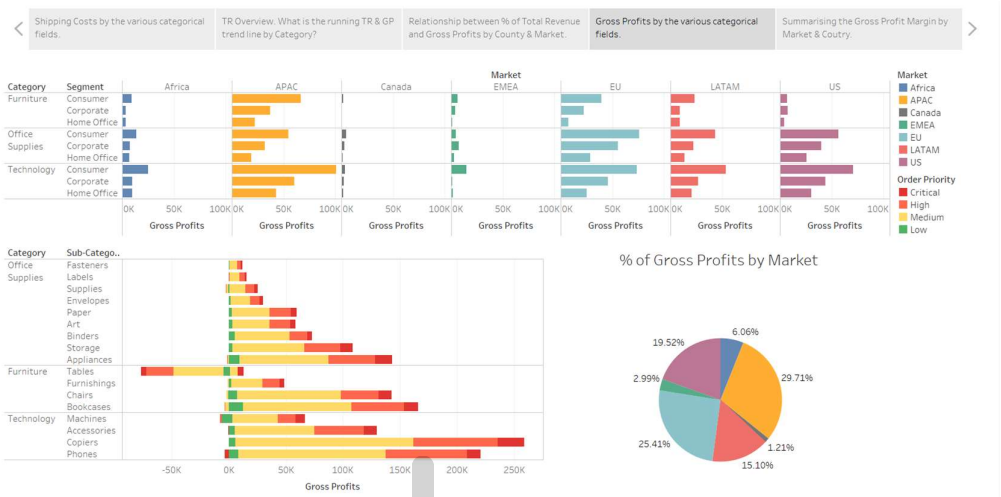

Figure 9: Gross Profits Overview

Here we are showing the summary of the Gross Profits by the various categorical groups.

4.5 Geographical Overview

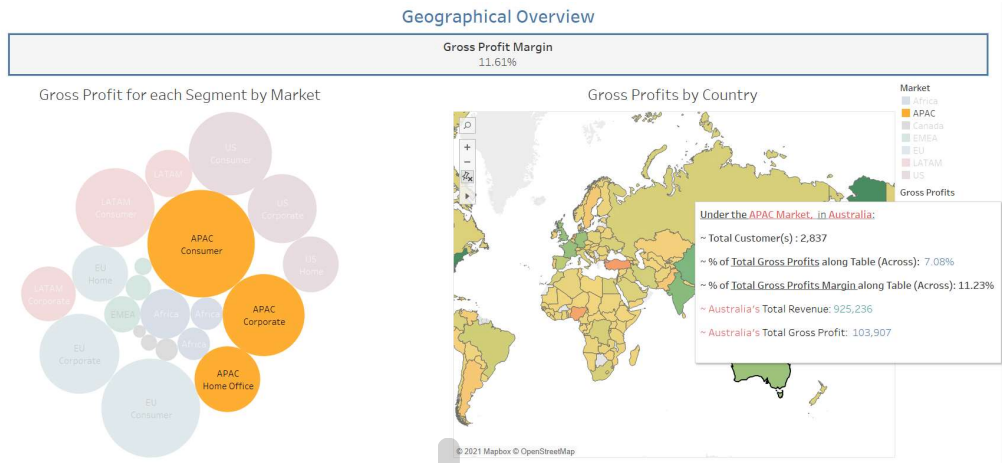

Figure 10: Geographical Overview (Map as Source Sheet)

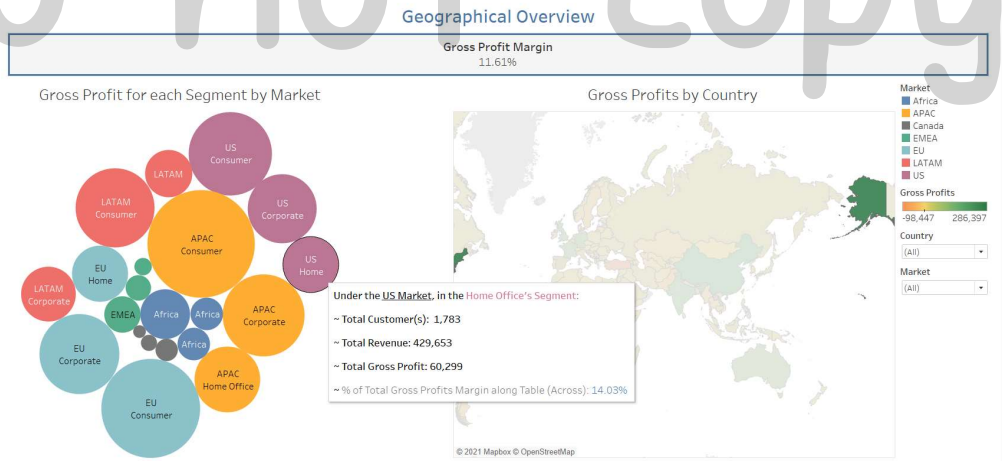

Figure 11: Geographical Overview (Bubbles as Source Sheet)

Ending off with an interactive dashboard that shows the total number of customers in each Country and its Total Revenue and Total Gross Profit. So that we can easily compare the relation for most more customers generally meant higher Revenues and Gross Profits. We can also hover on the Market bubbles to see the colour of Gross Profits by Country.

5 Further Recommendations

We recommend finding out:

1. Why Tables aren't selling well as our analysis have shown that it is incurring a huge loss of more than 50k. Is the problem due to our cost price or selling price or maybe due to other competitors?
2. Why are we doing so well in US and not in Canada?
3. Though Copiers do give us the highest total Gross Profits focusing on selling Phone, the next highest Gross Profits sum are much better as they are lighter meaning Shipping Costs would be cheaper. Also most people these days need phones more than they need Copiers meaning is a bigger market size to target.

6 References

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