

Data Visualisation: Empowering Business

with Effective Insights

Internship Informations :

An online retail store has hired you as a consultant to review their data and provide insights that would be valuable to the CEO and CMO of the business. The business has been performing well and the management wants to analyse what the major contributing factors are to the revenue so they can strategically plan for next year.

The leadership is interested in viewing the metrics from both an operations and marketing perspective. Management also intends to expand the business and is interested in seeking guidance into areas that are performing well so they can keep a clear focus on what's working. They would also like to view different metrics based on the demographic information that is available in the data.

A meeting with the CEO and CMO has been scheduled for next month and you need to draft the relevant analytics and insights that would help evaluate the current business performance and suggest metrics that would enable them to make the decision on expansion.

Remember, thinking from the perspective of business leaders allows you to analyse the data more effectively and present better insights.

Access the links in the resources below to better understand how business leaders think and approach business performance.

Important links:

- <https://www.datapine.com/blog/ceo-dashboard-report-examples-and-templates/>
- <https://www.scoro.com/blog/12-business-metrics/>
- <https://asana.com/fr/resources/success-metrics-examples>

TASK 1:

Questions of interest to the CEO:

Which region is generating the highest revenue, and which region is generating the lowest?

This question is important to the CEO as it is based on the fundamental source of income for the business, i.e., revenue. Revenue analysis is important to the CEO as top-level executives are always focused on earnings and how to increase it. Here, the CEO is interested in the viewing revenue by the regions, to assess which regions are generating the highest revenue and which regions are generating lower revenue. Using the data and

analysis, the CEO will be able to decide on how to further generate revenue in the regions that are already generating the most revenue. For the regions that are not generating enough revenue, the CEO will then study the reasons why there is a lack of sales in those regions and try to improve the products and make them more suitable for those regions.

What is the monthly trend of revenue, which months have faced the biggest increase/decrease?

A monthly trend of revenue will provide the CEO with insights on how the revenue is fluctuating each month. This will enable the CEO to analyze how the internal changes inside the company have had impact on the sales. E.g., how a new product launch has led to an increase in revenue during the month or how the introduction of a new region has led to an increase in revenue for the online store. The CEO can also analyze if there have been any delays internally that would have caused a potential decrease. Such analysis is vital for the senior management as it would enable them to plan ahead and try to make the customer experience as smooth as possible.

Which months generated the most revenue? Is there a seasonality in sales?

In retail businesses, there are always months that will have a greater demand due to seasonality. There will be cases where the data will experience regular and predictable changes that recur every calendar year. Such seasonal months would be necessary to identify as the CEO would be interested in devising a strategy that would gain the maximum benefit from the months that have greater demands.

Who are the top customers and how much do they contribute to the total revenue? Is the business dependent on these customers or is the customer base diversified?

This analysis is highly important as it would enable the CEO to identify what the main drivers are behind the total revenue. Looking at the top customers of the retail store would provide an idea of which customers are contributing the most to the revenue. The store can then derive a strategy where the top customers can be targeted with more products that they can buy. This will ensure higher revenue for the store as these customers are the top buyers from the store. Although having fewer customers buying in high volumes can be beneficial for a business, there can also be a drawback. Retailers would have less bargaining power with these customers because they drive the majority of the revenue for the store and can negotiate lower prices. The CEO needs to be notified of the diversification of the customers so that he can plan ahead of time. In cases where the business is highly dependent on a few customers, the plan would be to increase the customer base and target more customers that would bring more revenue to the store.

Questions of interest to the CMO

What is the percentage of customers who are repeating their orders? Are they ordering the same products or different?

This question shows that the CMO is interested in viewing the trends in customer orders. He is interested to know how many customers out of the total are coming back to them and re-ordering. This analysis will help explain to the CMO what percentage of customers are buying from them more than once. Once this is identified, the CMO can come up with a strategy to target these customers with more offers and products that they would need. The analysis will also be done to see what they are

buying the second time, this will provide the CMO trends into what products and sub products are in demand and then a marketing strategy can be devised to target these customers with better options.

For the repeat customers, how long does it take for them to place the next order after being delivered the previous one?

This analysis will help the CMO identify the frequency of orders. This would mean determining how long the customers are taking to re-order from the store. The expectation is that those customers who have recently made a purchase would have the product on their mind and are expected to purchase or use the product again in the future. Once the information is gathered from the analysis, the CMO can create a strategy to get the recent customers to revisit the business and spend more. For the customers who have not made purchases again from the store, efforts can be made to remind them that it has been a while since they last purchased from the store. Incentivizing customers also comes into play in this scenario.

What revenue is being generated from the customers who have ordered more than once?

Revenue stems from how much the customer spends to purchase the products from the store. Therefore, the analysis needs to be done to determine how much revenue is being generated from the customers who are regular buyers from the store. The CMO can devise a strategy to encourage customers who spend more money on repeat purchases to continue to do so. It is also important to note that if a customer has made a big purchase the first time, they should be encouraged to come and shop from the store again. A marketing strategy will ensure that the high paying customers will continue to bring more revenue to the store going forward, as well.

Who are the customers that have repeated the most? How much are they contributing to revenue?

It is also important to assess which customers are repeating the most and how much are they contributing to the revenue. There would be customers who need the same products on a weekly or monthly basis, however, the products do not have a high monetary value. Therefore, the contribution to revenue for these customers will be low. On the other hand, there might be customers who are ordering twice a year and have very big orders in terms of revenue. These customers buy on certain months only, therefore, the management needs to ensure that enough supplies are available to accommodate their orders. The customers with high order volumes and low revenue would need to be offered more discounts so that they can buy in bulk and lead to more revenue.

TASK 2:

- A Comprehensive Guide to the Grammar of Graphics

<https://towardsdatascience.com/a-comprehensive-guide-to-the-grammar-of-graphics-for-effective-visualization-of-multi-dimensional-1f92b4ed4149>

- How to Choose the Right Chart for Data Visualisation

<https://www.analyticsvidhya.com/blog/2021/09/how-to-choose-the-right-chart-for-data-visualization/>

- How to Choose the Right Chart for Your Data

<https://infogram.com/page/choose-the-right-chart-data-visualization>

- Additional Resources:

- Ultimate Guide to Choosing the Right Visual

<https://towardsdatascience.com/ultimate-guide-to-choosing-the-right-visual-2a77aa8eec08>

- How to Choose the Right Data Visualisation

<https://chartio.com/learn/charts/how-to-choose-data-visualization/>

- Which Type of Chart or Graph is Right for You?

<https://www.tableau.com/learn/whitepapers/which-chart-or-graph-is-right-for-you>

Here is the background information on your task

You have been asked by the CEO and CMO to provide visuals on the metrics that they wish to analyse for the online retail store. You will gather the requirements and provide them with the type of visual that would be best suited to the scenario. The senior management wants to understand **how their business is performing and what areas are the key strengths of the company**. They are also focused on **identifying opportunities that would lead to growth and generate more revenue in the future**.

You will be provided multiple visualisation requests by the CEO and you would need to provide the visual which would explain the data and insights in the simplest possible manner. **The visual should adequately convey the information that you are trying to present**. This exercise is critical to the senior management as any incorrect representation can lead to a wrong message being conveyed, or a wrong decision taken by the management. Therefore, you would need to make sure that the correct visuals are used to represent each set of data.

Q1/5: The CEO of the retail store is interested to view the time series of the revenue data for the entire year. The CEO is interested in viewing the seasonal trends and wants to dig deeper into why these trends occur. This analysis will be helpful for the CEO to forecast for the next year.

Which visual would most likely help the CEO analyse the data?

Ans: Line Chart

A line chart is used to represent repeated measurements taken over regular time intervals. Time is always displayed on the horizontal axis and values on the vertical axis. The line chart would enable the CEO to see important changes in the data, like seasonality or cyclic behaviour, which will provide a better understanding of the revenue and help forecast better.

Q2/5: The CMO is interested in viewing the top 10 countries which are generating the highest revenue. Additionally, as a subcomponent, they would also like to see which products are contributing to the total revenue being generated by each country.

Which visual would enable the CMO to view the revenue for each country and the breakdown by products on a single chart?

Ans : Stacked Bar Chart

A stacked bar chart would be used here as the chart allows users to compare subcomponent pieces across different categories. The height or length of the bars will represent the total revenue generated by each country. Each bar will be divided into the products sold, where the major portion will be allocated to the products that are generating more revenue. This will allow the CMO to view the total revenue data as well as the revenue for each individual product.

Q3/5: The CEO of the online retail store wants to see how much average revenue is generated by each country. They are interested in viewing the following metrics on the visual:

Minimum value

First quartile value

Median value

Third quartile value

Maximum value

Which chart would you create to show the above metrics for the average revenue generated by each country?

Ans: Box Plot

The CEO's request would best be fulfilled using a box plot. The box plot would show the distribution of data based on a five number summary ("minimum", first quartile, median, third quartile, and "maximum"). Boxplots are used to graphically demonstrate the locality, spread and skewness groups of numerical data. Boxplots are used to graphically demonstrate the locality, spread and skewness groups of numerical data. By using the boxplot, we can easily spot outliers and the distribution of the plot.

Q4/5: The CMO of the online retail store wants to view the information on the top 10 customers by revenue. They are interested in a visual that shows the greatest revenue-generating customer at the start and gradually declines to the lower revenue-generating customers. The CMO wants to target the higher revenue-generating customers and ensure that they remain satisfied with their products.

Which visual would help the CMO understand the data on revenue generated by the top 10 customers?

Ans : Column Chart

The CMO's request would best be fulfilled by using a column chart. Column charts are used to display comparisons between different items. Alternatively, you can view a comparison of items over time. In this case, the column chart would display the top 10 customers who are contributing the most to revenue. The first bar on the left would be the longest one and would display information for the customer who bought the most goods from the online store. The revenue contributed by each customer would gradually decline as the bars move to the right.

Q5/5: The CEO is looking to gain insights on the demand for their products. They want to look at all countries and see which regions have the greatest demand for their products. Once the CEO gets an idea of the regions that have high demand, they will initiate an expansion strategy which will allow the company to target these areas and generate more business from these regions. He wants to view the entire data on a single view without the need to scroll or hover over the data points to identify the demand.

Which chart would be most useful to provide the CEO information on the demand in each region?

Ans: Map Chart

A map chart would be the best option for visuals here as it will allow the CEO to view the demand information on a single view. The map chart will have all the countries on a single map and the demand will be displayed by highlighting the area of each country. Dark highlights would mean that the countries have high demand for products whereas the countries that are highlighted light colour are the ones that have low demand. Geographical data is best visualised using map charts as they are very easy to view and the underlying values are also easy to analyse.

Question 1

The CEO of the retail store is interested to view the **time series of the revenue data for the year 2011 only**. He would like to view granular data **by looking into revenue for each month**. The CEO is interested in viewing **the seasonal trends** and wants to dig deeper into why these trends occur. This analysis will be helpful for the CEO to forecast for the next year.

Question 2

The CMO is interested in viewing the **top 10 countries** which are **generating the highest revenue**. Additionally, the CMO is also interested in **viewing the quantity sold along with the revenue generated**. **The CMO does not want to have the United Kingdom in this visual**.

Question 3

The CMO of the online retail store wants to view the information on the **top 10 customers by revenue**. He is interested in a visual that shows **the greatest revenue generating customer at the start and gradually declines to the lower revenue generating customers**. The CMO wants to target the higher revenue generating customers and ensure that they remain satisfied with their products.

Question 4

The CEO is looking to gain insights on the demand for their products. He wants to look **at all countries and see which regions have the greatest demand for their products**. Once the CEO gets an idea of the regions that have high demand, he will initiate an expansion strategy which will allow the company to target these areas and generate more business from these regions. He wants to view the entire data on a single view without the need to scroll or hover over the data points to identify the demand. **There is no need to show data for the United Kingdom** as the CEO is more interested in viewing the countries that have expansion opportunities.

Task 4 :

Good Afternoon,

I'm Khalil JOUINI, and I'm eager to share some information with you regarding your company. I appreciate you giving me the leading questions. Seeing the sorts of insights, you expect to derive from the data was useful. I really believe you will find the analysis convincing and useful as you decide how to proceed with your next business prospects.

I want to start by assuring you that I have given the most accurate and current analysis. I cleaned up any records with negative quantities and unit prices after loading the data into my software, since it was necessary to do so in order to give useful analysis.

1st

Regarding your first query, the CEO has asked for a revenue trend to determine whether retail sales are seasonal. According to the data, there are several months of the year that have significant development. According to the statistics, the first eight months of sales from January to August were very stable, with an average of \$685K (Six hundred eighty-five thousand US dollars) in revenue per month. The increase in revenue begins in September, when it grows by 40% over the previous month. This pattern persisted up until November, when it rose to 1.5 million US dollars, the largest amount of the whole year. Unfortunately, since the data for December is insufficient, no inferences can be made from it. This research demonstrates how seasonality—which generally happens in the last four months of the year—affects retail store sales.

2nd

The top 10 countries with the most potential for growth are represented in the second graph. Since the UK already has a large demand and I understand you are more interested in nations where demand may be boosted, the UK is not included in these statistics. According to the data, sales of units and income are quite high in nations like the Netherlands, Ireland, Germany, and France. To guarantee that steps are taken to further seize these markets, I would propose concentrating on these nations.

3rd

The top 10 consumers who have made the most purchases from the business have been the subject of the third study. According to the statistics, there are not many differences between the top 10 consumer purchases. The fact that the highest revenue-producing consumer only spent 17% more than the second highest demonstrates that the company does not rely solely on a small number of consumers to generate income. This demonstrates that consumers' ability to negotiate is limited and that the state of business is positive.

4th

The map chart concludes by comparing the places that have produced the greatest revenue to those that have not. Apart from the UK, it is clear that nations like the Netherlands, Ireland, Germany, France, and Australia generate large profits, and the company should invest more in these nations to boost product demand. The map also reveals that the majority of sales occur only in the European zone, with only a small number in the American region. Along with Russia, there is no market for the items in Africa or Asia. Sales revenues and profitability might increase with the implementation of a fresh strategy focused on these areas.

I much appreciate your time. After you've had a chance to process this material, if you have any questions about the analysis or would want to see anything additional, I would be glad to create it for you.

Thank You