HEICODERS ACADEMY
DA100: DATA ANALYTICS WITH SQL AND TABLEAU

Capstone Project: Analytics Report

Ensure your analytics report addresses all these aspects of your Capstone Project:

1. Identify Audience & Needs (3 marks)

- What is the business problem you are looking to solve?
- Who is your intended audience, and what role do they play in the organization?
- List 2 methods you would use to identify your audience's needs and expectations from your analysis.

2. Commentary on Tableau Dashboard (5 marks)

- Give a summary of your data source, what your dataset contains, and its constraints (e.g. time period of data collection).
- Describe all visual elements on your Tableau Dashboard
    - Summarize data trends and patterns, focusing on what's relevant to audience
    - Avoid the use of technical jargon that may be unfamiliar to your audience.

3. Summary of Takeaways (4 marks)

- Given your findings, what are the recommended actions your audience should take?
- Recommend further areas of research and any additional data you might require to delve deeper into your analysis.

Refer to grading rubric for details:
https://heicodersacademy.notion.site/DA100-Capstone-Project-3f46f2d81b794c78ad3dc8b4461fdb10

1. **Identify Audience & Needs (3 marks)**

- What is the business problem you are looking to solve?

  The business problem to be solved is how to increase credit card transaction volume in the following quarter by analysing underlying consumer spending patterns. For the purposes of the analysis, transaction volume is taken to be transactions in dollar amount.

- Who is your intended audience, and what role do they play in the organization?

  The intended audience are the product and marketing teams of GoCard. The product team is in charge of developing and improving features and usability of GoCard to meet the needs of existing and potential consumers. The marketing team is in charge of promoting and driving the usage of GoCard amongst existing customers as well as to capture new customers and grow GoCard's market share.

- List 2 methods you would use to identify your audience's needs and expectations from your analysis.

  One way could be to hold focus group discussions to better understand the needs and goals of the audience to better tailor the analysis. Another way will be to look through past reports and analysis to understand the metrics that interest the audience and follow up on further areas of research listed in previous analytics/reports.

2. Commentary on Tableau Dashboard (5 marks)

- Give a summary of your data source, what your dataset contains, and its constraints (e.g. time period of data collection).

  The data comes from 4 separate tables (gocard, malls, towns and transaction. The gocard and transactions table are probably internal data sets from Heicoders Bank and contain

  (a) a list of GoCard IDs and the corresponding Customer ID (i.e. the customer tagged to the GoCard) and
  (b) a list of Transaction IDs with the corresponding GoCard IDs and other information pertaining to the transaction (such as the time of transaction, the amount spent, category of items bought, payment method (online/physical/virtual) and the mall location at which the transaction was made

  respectively.

  The mall and towns table contain geospatial data, including the longitude and latitude of the malls and towns in Singapore, as well as the town in which the mall is in.

  There are constraints in the dataset provided. For example, the time period of the dataset is only from October 2018 to May 2020, and hence only about 7 quarters of data for analysis

(with the last quarter being incomplete as the last transaction record for the quarter was on 26 May 2020). The dataset only contains data on transactions that took place in malls, but not in places that are not malls nor transactions on online shopping platforms such as Shopee. Hence, it may not present a full picture of the transactions that have been made with GoCard.

- Describe all visual elements on your Tableau Dashboard
    - Summarize data trends and patterns, focusing on what's relevant to audience
    - Avoid the use of technical jargon that may be unfamiliar to your audience.

Based on the topline statistics, there was a total of about $7.2 million from 41,707 GoCard transactions from October 2018 to May 2020, which translated to an average of about $173 per transaction. The highest expense category was installments, which accounted for about two thirds of the transaction amount (~$4.9 million). In terms of location, Admiralty had the highest transaction amount (~$361,000 or about 5% of total transaction amount) during the period.

Looking at the treemap, which gives a quick visual breakdown of the topline transaction figures, food and travel were also significant expense categories besides installments, amounting to 13.1% and 8.4% of transactions respectively. With the exception of food, these categories also had a higher-than-average dollar amount per transaction (e.g. The average per transaction for installments amounts to $1,850, much higher than the $173 per transaction across all categories).

The stacked bar chart gives a sense of the change in quarterly transactions by the different expenses. With the exception of food, the higher expense categories (installments and travel) showed bigger fluctuations from quarter to quarter. This seems reasonable as installments and travel are typically discretionary spending on big-ticker items. Whilst not a big expense category in absolute terms, bills is also a relatively big-ticket item (average of $328 per transaction) contributing to the volatility. The changes from these expense categories resulted in the overall change in quarterly transactions also showing similar fluctuations, as seen in the bar chart. On the other hand, day-to-day expenses like food and grocery were relatively more stable from quarter to quarter.

The map shows the distribution of transactions by town, with the size of the circle corresponding to the dollar amount of transactions and the colour intensity corresponding to the number of malls in the town. The bigger circles tend to be for towns located in the northern or eastern part of Singapore. This is corroborated with the detailed data table found below the map, which sorts transactions in dollar amount by town in descending order. The top 3 towns with the highest transaction amount during the period are Admiralty (in the north), Tampines and Pasir Ris (both in the east). Meanwhile, the 3 towns with the lowest transactions based on the data table were Dhoby Ghaut, Clarke Quay and Promenade, which are located in the southern part of Singapore. Hence, there appears to be a somewhat asymmetrical distribution of transactions geographically.

While the disparity in transactions could be partially explained by the number of malls in each town, with the top 3 towns having 4 to 5 malls each, while the bottom 3 towns have

only 1 mall. However, it is also to be noted that some towns have transactions levels that do not seem as high relative to the concentration of malls. For example, Orchard, as indicated as the darkest circle on the map, has 11 malls. That is 6 more than Admiralty, but it still recorded a substantially lower transaction than the latter (~$214,000 vs ~$361,000). Another example is Somerset. (7 malls, ~$115,000)

Instead, there appears to be a better correlation between transaction amount and transaction volume. Looking at the data table, the transaction amount and transaction volume columns are colour-coded, with a darker colour indicating a higher level. As the distribution of colour intensity for the two columns appear to be similar, it suggests that for towns with a higher transaction dollar amount, they also tend to have malls with higher transaction volumes.

The donut chart gives a breakdown of transaction amount by payment method and based on data for the entire period, online transactions accounted for about 75% of total transactions. The average per online transaction ($967) is also much higher than the average for physical card ($51) and virtual wallet ($41).

Online transactions have a higher amount per transaction on average because expenses that have a higher average amount per transaction (e.g. installments, travel and bills) tend to be paid using the online method, as can be seen from the last data table on the bottom right of the dashboard.

For expense categories that have a lower average amount per transaction (such as food, grocery etc), there is a higher proportion of such transactions being paid by physical cards. Whilst online payment only forms a small percentage for these expense categories, it is interesting to note that the average amount per transaction using online payment for these expense categories tends to be higher than the average paid using physical cards.

3. Summary of Takeaways (4 marks)

- Given your findings, what are the recommended actions your audience should take?

  From the findings, we have identified installments and travel as higher expense categories that have a significant impact on the change in overall transaction dollar amount. Hence, priority should be given to drive transactions in these categories. Since these are discretionary, big-ticker items, we could work with retailers selling big-ticket items and travel agencies to organise promotions and fairs/events and offer special rewards/discounts for GoCard users to boost purchase of high expense items. In addition, by organising such fairs/events, it will bring more foot traffic to the malls and possibly increase transactions in other expense categories such as food.

  For expense categories that has spending that is less lumpy and more stable across time such as food and grocery, we should look into more longer-term promotions to encourage continued usage and steady growth across time, such as introducing or enhancing membership incentives/rewards, with bigger incentives/rewards given for higher accumulated purchase amounts for example.

In our analysis, we have also seen that there is a somewhat asymmetrical distribution of transactions geographically, with towns in the northern and eastern parts of Singapore recording higher transaction amounts as compared to towns in the western and southern parts of Singapore. For the towns that are not doing so well in terms of transactions, we can organise road shows/distribute flyers to promote awareness of GoCard to nearby residents or visitors to the area and boost GoCard sign ups and usage. Working with the individual malls and introducing mall-specific GoCard promotions may also be a possible idea to pursue.

Last but not least, our findings also showed that big-ticket items such as installments and travel are mainly paid using the online method. For other categories such as food and grocery, the average per transaction is also generally higher for online payment as compared to other methods. Hence, we should also focus on increasing the usage of online payment method, and maybe work with payment platforms to deliver a better user experience and drive usage accordingly.

- Recommend further areas of research and any additional data you might require to delve deeper into your analysis.

  The dataset provided did not have much information on the customer except for Customer ID. It would be good if we could match the dataset with information on the customer profile such as age, gender etc to better understand the spending patterns of different consumer groups so that marketing efforts can be more targeted.

  Another possible area of research is to understand the spending pattern for online shopping. The dataset given only contains transactions for offline shopping malls. It would be good to complement the existing analysis with online shopping data to understand how spending patterns differ between offline and online shopping.

  It would be also good to understand whether any change in transaction amount could be linked back to previous marketing campaigns/promotions or the introduction of new features so as to better ascertain the impact on transaction amount. Hence, data on the timelines and details of the implementation of such campaigns/new features would be useful to layer upon the existing data.

  Last but not least, it would also be good to obtain demographics data from government data sources (for example, the number of residents in each town, number of residents living within 400 metres radius of the shopping malls, household profile of residents etc) in order to better understand the catchment areas around shopping malls and to assess how much more potential there is to tap in the catchment areas to boost GoCard transactions.