**HEICODERS ACADEMY**

**DA100: DATA ANALYTICS WITH SQL AND TABLEAU**

**Capstone Project: Analytics Report**

**Student Name**:

**<Enter your full name here>**

**Before submission, rename your file to DA100 Capstone Project - <FirstName> <LastName>.docx**

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 I am looking to address is to increase the credit card transaction volumes for GoCard. This will involve gaining a deeper understanding of consumer spending patterns and identifying the effective marketing strategies to encourage more transactions.

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

**1. Product Team : -**

The product team is responsible for the development and improvement of GoCard as a product. They will be interested in understanding consumer behaviours and preferences so as to enhance the features and benefits of the credit card.

**2. Marketing Team : -**

The marketing team is responsible for promoting GoCard to potential customers and retaining existing ones. They will be interested in effective strategies to increase transactions and usage.

**3. Head of Product : -**

The Head of Product is the decision maker who oversees the product’s performance and lays down the strategic direction. They are interested in the actionable insights that can drive business growth.

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

1. **Discussion with Stakeholders : -**

Conduct one-on-one or group discussions with team members of Product and Marketing to gain insight on their pain points, goals and expectations regarding GoCard’s performance and what are some potential areas of improvement.

2.  **Survey and Questionnaires : -**

Conduct surveys or questionnaires to the Product and Marketing teams to compile quantitative data on their expectations, challenges faced and desired outcomes regarding GoCard. This will provide structured feedback and help to centre the focus areas for analysis and recommendations.

**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).

**1. Coordinates Table :-**

• This table contains information about the residential towns in Singapore.

It contains the following columns:

**• sn**: Serial number starting from 0 to 157.

**• name**: Name of residential towns in Singapore.

**• lat**: Latitude coordinates of the residential towns.

**• lng**: Longitude coordinates of the residential towns.

• There are a total of 157 rows in this table and the last row contains null values.

**2. Transactions Table :-**

• This table contains information about transactions made in different residential towns in Singapore.

• It has the following columns:

**• sn**: Serial number corresponding to the residential towns.

**• town**: Name of residential towns in Singapore.

• **date :** Date of the transaction in the format 'YYYY-MM-DD'.

**• card\_type**: Type of credit card used (Gold, Silver, Signature, Platinum).

**• exp\_type**: Type of expenses made during the transaction.

**• gender**: Gender of the cardholder.

**• amount**: Amount spent during the transaction.

• There are a total of 26,052 rows in this table and the dataset may cover a certain time period during which transactions were recorded.

**3. Constraints :-**

• The dataset does not contain explicit information about the time period of data collection. This might be a hindrance to ascertain the timeframe covered by the transactions to contextualise the analysis accurately.

• The "coordinates" table provides geographical information about residential towns, aiding in spatial analysis and visualisation.

• The "transactions" table captures various attributes of transactions such as card type, expenses type, gender, and amount, enabling analysis of spending patterns and demographic trends across different residential towns in Singapore.

• 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.

There are four visualisation elements in the dashboard. The first one is a regional map depicting the total value of transactions and total number of transactions per town in Singapore. The regional transactional map can be toggled by the audience to filter by all towns, multiple towns or individual towns for ease of analysis. Above the regional map, there are three calculated fields of the dataset, namely the total number of transactions, the average transaction amount, and the total value of transactions. This can give the audience a more visual and overall summary of the transactions directly. Above the calculated fields, there is a slider filter based on the date range of the dataset, which filter applies to all of the visualisation elements except the animated bar chart. This filtering slider enables the audience to seamlessly select the time period they would like to view the regional, transaction and product analysis in. On the bottom left, a bar chart depicting the distribution of transaction amount across different card types, in which each card type is discerned based on color. This visualisation allows the audience to gain an overall idea on which product is performing better or worse based on the expense type and transaction amounts. On the middle right, a product analysis data chart is depicted for the audience to further breakdown how every card type is fairing in terms of number of transactions, type of expenses and total amount of transactions. This is for the audience who prefer to look at figures for a more detailed analysis. The bottom right shows an animated transactional analysis of the card types over the years (2018-2020), with a toggle on the left to select the year and play/pause the animation.

**Based on the regional map, Bukit Gombak, a west-central town, has the most card transactions over the years while towns that have the least card transactions, varies according to time period. This data trend indicates several things to the audience.**

1. Population density and Economic Activity

• Bukit Gombak has a higher population density and more economic activity compared to the rest of the towns. Areas with higher population density and commercial establishments tend to have more card transactions.

2. Socioeconomic Factors

• Bukit Gombak as a town might have a higher socioeconomic status, with residents having higher disposable income levels and purchasing power. As a result, they are more likely to use credit cards for transactions, contributing to higher transaction volumes.

3. Infrastructure and Technology Adoption:

• Bukit Gombak may have better infrastructure and technology adoption, including contactless payment systems and digital wallets, which encourage cashless transactions. Conversely,other lower transactional towns may have limited access to such technologies, resulting in lower card usage.

**The trend observed in the distribution of transaction amounts across different expenses for each card type from 2018 to 2020 reveals valuable insights into consumer spending behaviors and preferences:**

1. Transaction Amount Distribution by Card Type:

• The bar chart indicates that transactions with the Platinum card type consistently have the highest transaction amounts, while transactions with the Signature card type consistently have the lowest transaction amounts.

• This disparity in transaction amounts suggests that Platinum cardholders tend to make larger purchases or engage in higher-value transactions compared to Signature cardholders.

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2. Expense Types with Highest Utilisation:

• Across all card types (Platinum, Gold, Silver, and Signature), the analysis reveals common expense categories where cards are frequently used.

• The most utilised expense categories, in descending order, are food, entertainment, travel, grocery, fuel, and bills.

• This trend indicates that consumers prioritise spending on essential needs such as food and groceries, as well as discretionary expenses like entertainment and travel.

3. Implications for Consumer Behavior:

• The preference for using credit cards, especially Platinum cards, for larger transactions suggests that cardholders may prioritise convenience, rewards, and benefits associated with higher-tier cards for significant purchases or luxury expenditures.

• The consistent utilisation of credit cards across various expense categories highlights the versatility and convenience of cashless payment methods in daily life, covering a wide range of expenditures from essentials to discretionary spending.

**The data chart, which presents card analysis per expense type, corroborates the trends observed in the bar chart, albeit in numerical figures.**

1. Consistent Card Type Patterns:

• The card analysis per expense type reaffirms the pattern observed in the bar chart, where Platinum cards consistently exhibit higher transaction amounts compared to other card types, while Signature cards consistently show the lowest transaction amounts across different expense categories.

• This consistency in card type patterns underscores the stability of consumer spending behaviors and preferences over the three-year period.

2. Expense Categories with Highest Utilisation:

• Across the years 2018 to 2020, the analysis highlights the common expense categories where credit cards are predominantly used, such as food, entertainment, travel, grocery, fuel, and bills.

• This trend underscores the enduring importance of these expense categories in consumer spending habits and reflects the diversified usage of credit cards for various everyday expenditures.

3. Implications for Cardholder Behaviour and Preferences:

• The consistent utilisation of credit cards across different expense categories suggests that cardholders prioritize the convenience, security, and benefits associated with cashless transactions, regardless of the specific card type.

• The preference for using higher-tier cards, such as Platinum cards, for larger transactions implies that cardholders may seek to maximise rewards, cashback, or other incentives offered by premium card programs for significant purchases.

**The animated bar chart presenting the transactional analysis of card types, showcasing the average amount across 2018-2020, provides valuable insights into card usage trends over the three-year period.**

1. Dominance of Platinum Cards:

• The animated bar chart illustrates that Platinum cards consistently emerge as the most used card type across the years 2018 to 2020, based on the average transaction amounts.

• This dominance of Platinum cards suggests that cardholders with higher-tier cards tend to engage in transactions with larger average amounts compared to other card types.

2. Following Sequence of Card Usage:

• The analysis reveals a sequential order of card usage, with Gold cards typically following Platinum cards in terms of average transaction amounts.

• Silver cards generally occupy the third position in the hierarchy of card usage, indicating moderate transaction amounts compared to Platinum and Gold cards.

• Signature cards consistently appear as the least used card type, with comparatively lower average transaction amounts across the analysed period.

3. Implications for Cardholder Behavior:

• The trend of Platinum cards being the most used suggests that cardholders may prefer higher-tier cards for transactions involving substantial amounts, potentially to maximise benefits, rewards, or credit limits associated with premium card programs.

• Gold and Silver cards follow suit, reflecting varying levels of transaction activity among cardholders with different card types based on their financial preferences and spending habits.

• The lower usage of Signature cards implies that cardholders may opt for this card type for transactions involving smaller average amounts or for specific purposes where premium benefits are not as critical.

**3. Summary of Takeaways (4 marks)**

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

**Based on the findings derived from the analysis of consumer spending patterns and card usage trends, the following recommended actions can be proposed to your audience, which includes the Product and Marketing teams behind GoCard:**

1. Enhance Platinum Card Benefits and Rewards:

• Given the dominance of Platinum cards in terms of transaction volumes and average amounts, consider enhancing the benefits and rewards associated with Platinum card membership.

• Introduce exclusive perks, premium rewards, and personalised offers tailored to Platinum cardholders to incentivise continued usage and foster loyalty.

2. Targetted Marketing Strategies:

• Develop targeted marketing campaigns and promotional initiatives tailored to different cardholder segments based on card type preferences and spending behaviors.

• Tailor offers that resonate with the unique needs and preferences of Platinum, Gold, Silver, and Signature cardholders to drive engagement and card usage.

3. Optimize Card Portfolio Management:

• Evaluate the existing card portfolio to ensure alignment with cardholder preferences and market demands.

• Consider introducing new card products or revamping existing offerings to address evolving consumer needs, enhance competitiveness, and capture emerging market opportunities.

4. Continuous Monitoring and Optimisation:

• Establish mechanisms in place for ongoing monitoring, measurement, and optimisation of card usage trends, consumer behaviours, and market dynamics.

• Utilise analytics tools and performance metrics to track the effectiveness of marketing initiatives, assess customer satisfaction levels, and identify areas for improvement.

5. Innovative Product Development:

• Foster a culture of innovation and collaboration to drive product development initiatives aimed at addressing emerging consumer needs, technological advancements, and market trends.

• Explore opportunities for partnerships, alliances, and integrations to enhance the value proposition of GoCard products and services.

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

**To delve deeper into the analysis of consumer spending patterns and card usage trends, the audience can consider exploring the following areas of research and additional data sources.**

1. Segmented Cardholder Analysis:

• Conduct a more detailed segmentation analysis of cardholders based on demographic factors (age, income, occupation) and spending behaviours.

• Gather data on cardholder demographics, lifestyle preferences, purchasing habits, and transaction histories to identify distinct customer segments and tailor marketing strategies accordingly.

2. Competitive Benchmarking and Market Intelligence:

• Conduct competitive benchmarking and market research to gain insights into the strategies, offerings, and performance of competing credit card issuers and financial institutions.

• Obtain data on market share, cardholder acquisition trends, product features, rewards programs, and promotional activities to benchmark GoCard's performance and identify areas for differentiation.

3. Customer Satisfaction and Loyalty Analysis:

• Measure customer satisfaction levels, loyalty metrics through surveys, feedback mechanisms, and sentiment analysis tools.

• Collect data on customer feedback, complaints, and service interactions to understand pain points, identify opportunities for service improvement, and enhance overall customer experience.

4. Cross-Selling and Upselling Opportunities:

• Explore cross-selling and upselling opportunities by analysing customer purchase patterns, product affinity, and propensity to adopt additional financial products and services.

• Integrate data on banking accounts, loans, investments, and insurance products to identify synergies and promote bundled offerings to customers.

5. Predictive Analytics and Machine Learning Models:

• Implement predictive analytics and machine learning models to forecast future card usage trends, predict customer churn, and identify potential high-value customers.

• Utilise historical transaction data, customer interactions, and external factors such as economic indicators, market trends to develop predictive models and enhance decision-making capabilities.

6. Fraud Detection and Risk Management:

• Enhance fraud detection capabilities and risk management strategies through advanced analytics, anomaly detection algorithms, and behaviour-based profiling.

• Integrate data from transaction monitoring systems, fraud detection tools, and regulatory compliance databases to mitigate fraud risks and ensure regulatory compliance.

7. Mobile and Digital Banking Trends:

• Monitor trends in mobile banking adoption, digital payment methods, and fintech innovations to stay ahead of changing consumer preferences and technological advancements.

• Analyse mobile app usage data, digital engagement metrics, and customer feedback to enhance digital banking platforms and drive user adoption.

8. Regulatory Compliance and Data Privacy:

• Stay informed about regulatory changes, industry standards, and data privacy regulations affecting the credit card industry.

• Ensure compliance with regulatory requirements, data protection laws, and industry guidelines governing credit card operations, customer data handling, and privacy rights.