REPORT ON CASE STUDY: CREDIT CARD ANALYSIS

REPORT ON CASE STUDY	
Title	Credit Card Customer Expenditure Analysis - Targeted Marketing
Industry Focus	Banking and Finance
Problem Statement	Utilizing data analytics to understand the behaviour of credit card users and identify potential customers that adds value to the business
Business Case Use	1. Predicting credit card users spending behaviour 2. Understanding demographics of credit card users 3. Identifying potential users that can boost revenue to business
Goals	To identify the user categories that spend the most and the key categories where they spend the most money
Deliverables	A presentation outlining key findings and recommendations from the collected user data
Availability of Datasets	Yes
Dataset List	Annual credit card Users, Credit card spend analysis
Source Website	1. www.kaggle.com 2. https://rbi.org.in/Scripts/Statistics.aspx

Report by:

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OUTLINE OF PROJECT FLOW

Steps Involved in the analysis:

1. Identifying key questions to answer and the type of data needed for the analysis project.

2. Collecting data from open-source data platforms (Kaggle, RBI) and assessing the reliability of the obtained data by validating consistency.

3. Cleaning and organizing data using SQL and Excel to ensure high accuracy of the analysis.

4. Performing data analysis using Tableau and R to identify trends and correlations.

5. Developing user-interactive dashboards and presentations to summarize insights for stakeholders.

STRUCTURE OF INPUT DATA

Source File	Credit Card Source Data
No. of Columns	21
No. of Rows	10267
Column Names	trans_id, trans_date_trans_time,cc_num,merchant,category, amt,first,last,gender,street,city,state,lat,long,city_pop,job, dob,merch_lat,merch_long,is_fraud,customer_id

DATA CLEANING REPORT

Source File: Credit card data.csv (Source file available in GitHub)

Steps for cleaning data:

→ Columns that were not necessary for the analysis was removed from the data sheet to ensure the data was relevant and focused only to answer the business problem discussed

→ Updated sheet with new column **Age** by finding age of user from DOB using DATEDIF function and column **full_name** from first and last name columns.

→ Removed duplicate rows of same data from the sheet using **remove duplicates** function in Ms Excel application

→ New column named **'Region'** was added to group the user transactions based on their **state of residence** in the given data using SQL codes and **missing data** was handled by manually grouping users into regions and state based on their residential address

→ The data source also contained details of **fraudulent transactions** made throughout the year and this was **removed** using SQL and Excel to ensure the data is trusted and reliable

→ **Cross-verified gender** of users with their names to ensure unbiased results and reduce factor of inaccuracy of the analysis

DATA STRUCTURE AFTER CLEANING

No. of Columns	9
No. of Rows	800
Column Names	trans_id,Category,Amount,Gender,State,Region,Full Name,Age,Range

ANALYSIS REPORT ON CREDIT CARD DATA

Source File: →CREDIT_FINAL.csv (Source file available in GitHub)

→RBI_CC.csv (Source file available in GitHub)

Analytical Process:

→ The **RBI_CC.csv** file was opened with Excel to analyse and plot a clustered column chart and Radar chart to easily depict the growth of credit card user base, revenue, and no. of transactions made by credit companies across various fiscal quarters from 2022-2024.

The plotted graphs are added below:

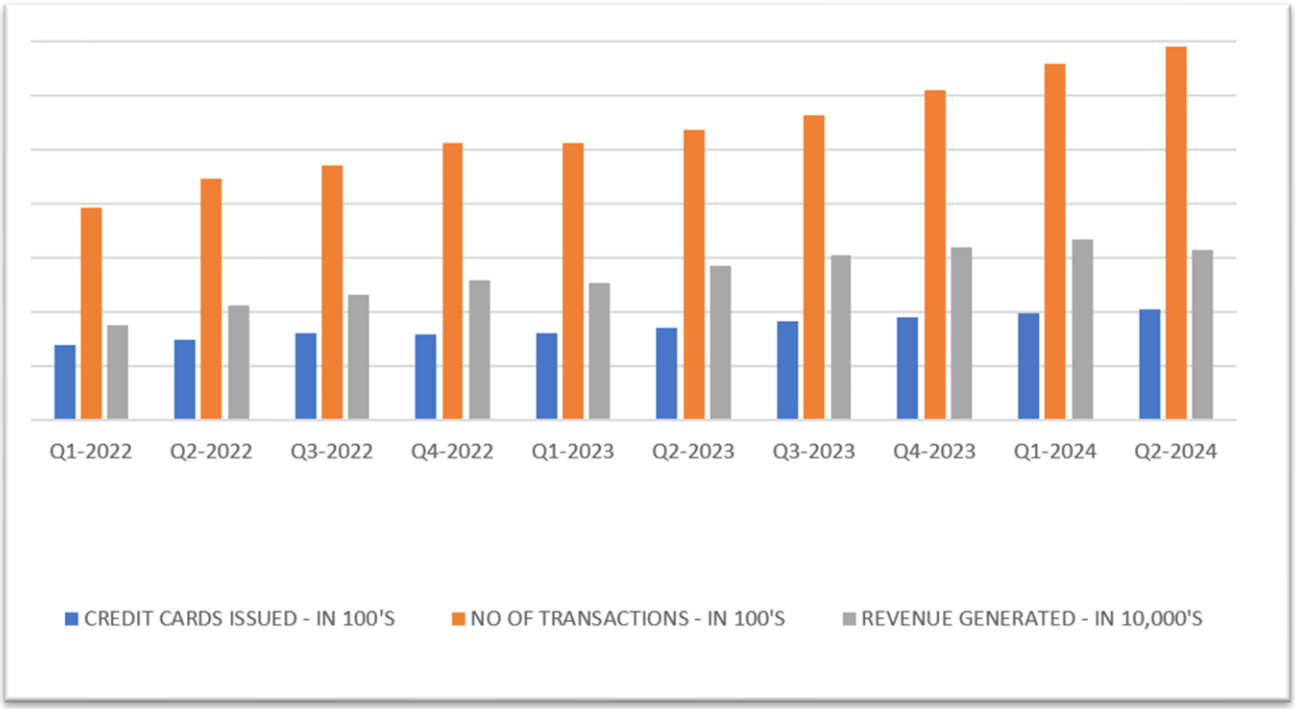

Fig.Column Chart

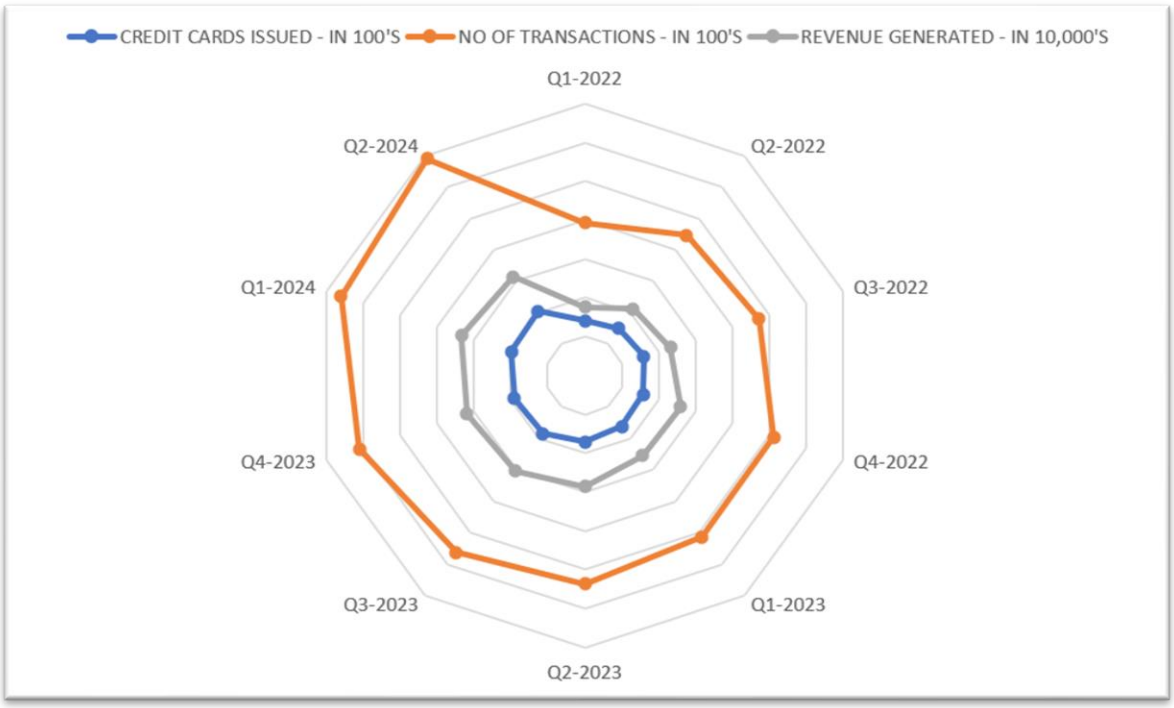

Fig.Radar Chart

Insights:

→ The visualizations highlighting quarter-over-quarter growth in the credit card market reveal its future potential and assist in forecasting revenue growth. These insights enable stakeholders to make informed strategic decisions and capitalize on emerging opportunities.

Analysis using Tableau:

→ Refer Report on Visualizations for creating Tableau dashboards and visualisations to perform analysis on the Credit card analysis data

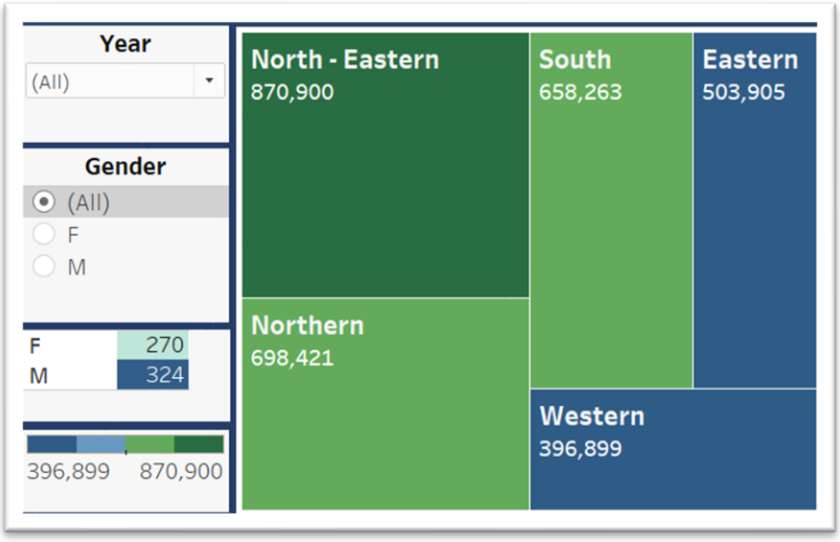

Fig.Heatmap-by region

Insights:

→ Customers from northeastern states spend the most using credit cards, followed by southern and northern states.

→ The western region shows more caution in credit card spending as they seem not to spend any higher amount using credit cards.

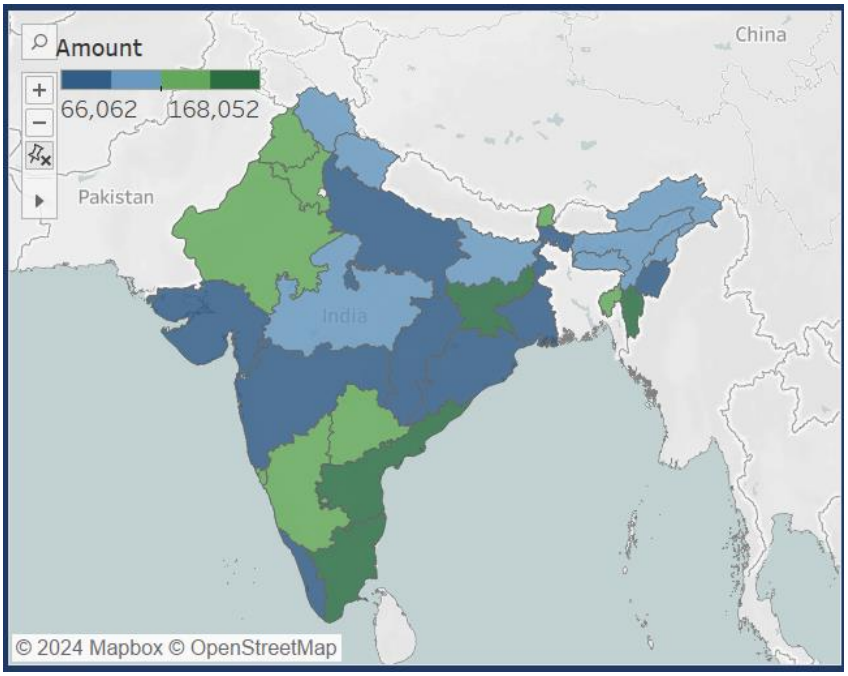

Fig.Symbol Maps – State wise

Insights:

→ Visualizations using symbol maps to depict the sum of amount spent by each state helps us to conclude:

- Southern states, **excluding Kerala**, spend large sums via credit cards.
- Only two northern states contribute significantly to the northeast's spending.
- The central region of India contributes less to total transactions and revenue

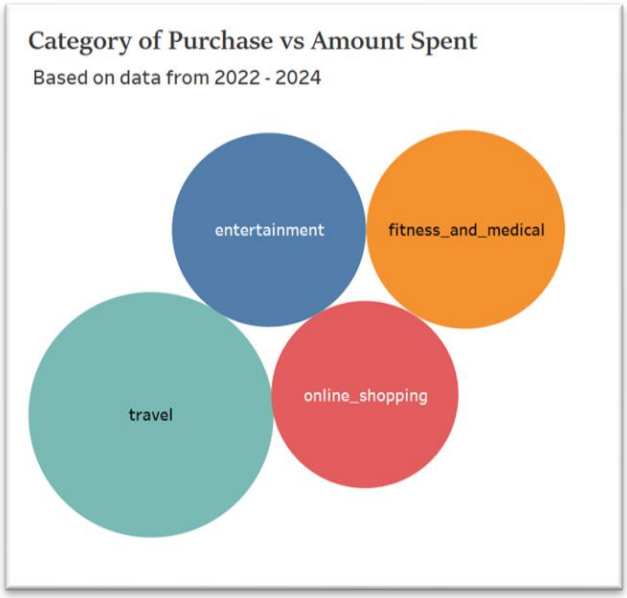

Fig.Bubble Chart-Female

Insights:

- Female users spend more on travel and fitness.
- Online shopping becomes the least priority for female users of age above 40 and younger users spend most on online_shopping and fitness_and_medical expenses
- Male users spend their credit cards mostly on fitness and travel,online shopping and entertainments are the third and fourth-most but very much closer to the all other categories
- Travel and entertainment are the most spent categories followed by online shopping and fitness_and_medical

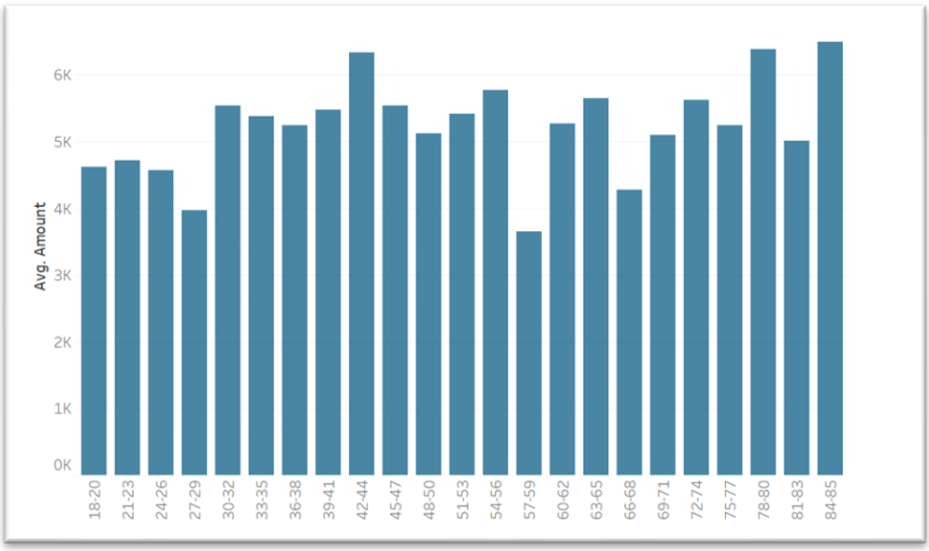

Fig. Column chart – Avg amount spend by Age range

Insights:

- Users aged 18-28 spend less compared to other age groups.
- Users in their late 50s and 60s spends very conservatively using credit cards
- Elderly people in their 70s and 80s are the most potential users who spend higher sum of money through credit card transactions

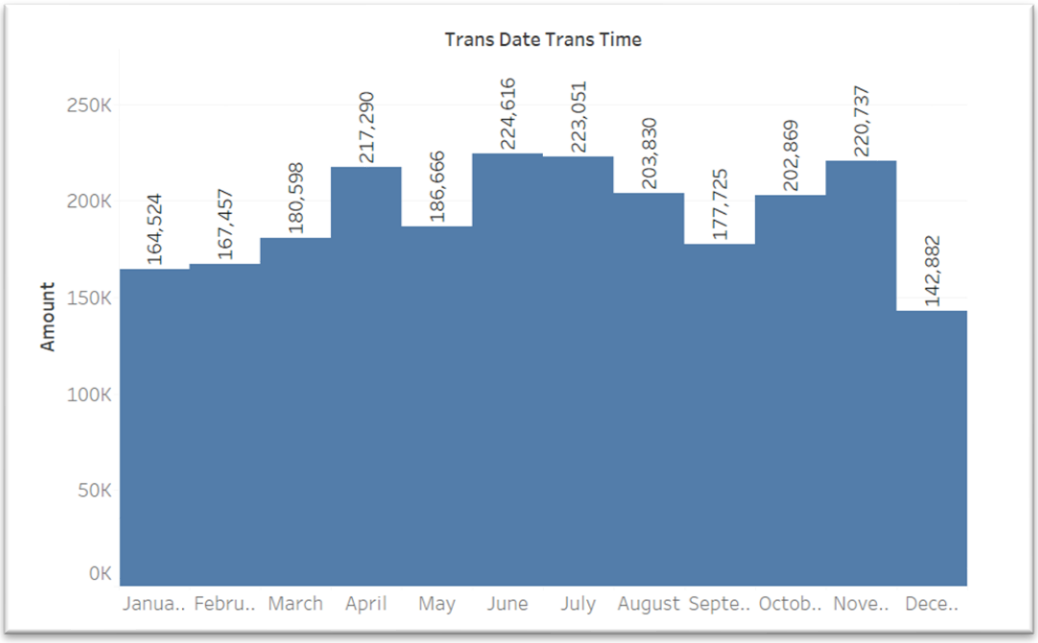

Fig. Column Chart – Monthly Spending Habits

Insights:

- June, July, and November have accounted for the major amount of revenue made throughout the year
- Users spend least amount of money using credit cards from December – March, these months have shown a continuous decline in user spendings

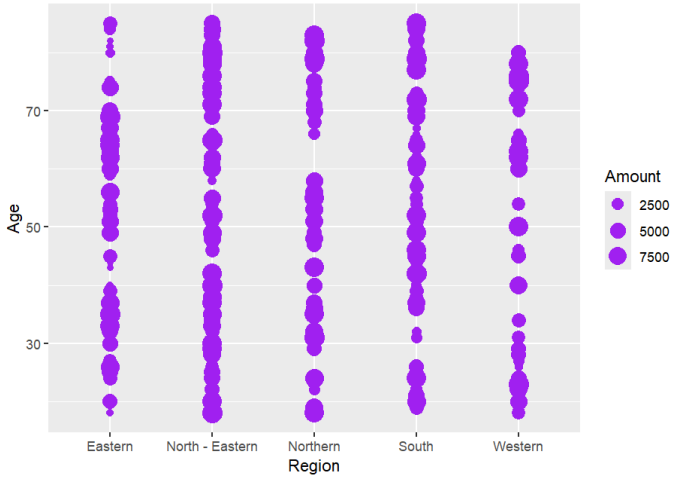

Fig. Male-Spending Analysis

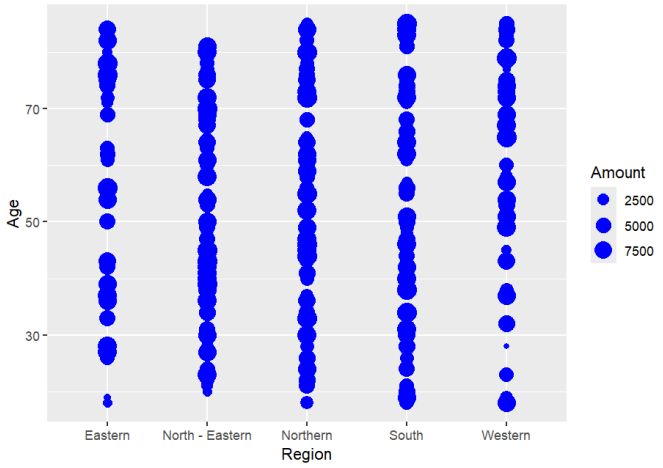

Fig. Female-Spending Analysis

Insights:

- Younger females in the western region spend less.
- Males aged 35-60 in the western region spend minimally.
- Both male and female users from North-eastern region spend the most amount through credit card transactions
- Northern female users spend more than the male users from their region
- Male users from the eastern states of India spend lesser than female users from the same region across all age range

VISUALIZATION REPORT ON CREDIT CARD ANALYSIS

Software Used: Tableau, Excel, and R (Programming Language)

Source File: →CREDIT_FINAL.csv (Source file available in GitHub)

→RBI_CC.csv (Source file available in GitHub)

→Credit card data.csv (Source file available in GitHub)

Designing Interactive dashboard:

→Importing data into Tableau software by connecting above mentioned files into Tableau's data sources tab and joining data from 'credit_final.csv' file with data from 'Credit card data.csv' file using left join

→Creating advanced charts and visualizations using sheet tab in Tableau. Convert **transaction_date** column into date format to create proper and advanced visualizations

→Use **dashboard tab** in Tableau to add the sheets in a single page using floating tiles option and add filters and title for the dashboard to prepare an interactive and responsive dashboard

Visualizations used:

→**Radar and Column charts** – Shows the gradual growth of credit card segment across each fiscal quarter from 2022-2024

→**Heatmap** – Compares the relative share of each region of country in total amount spent using credit cards

→**Column charts** – Depicts variation of spending ability across various age ranges and, to show the amount spent by credit cards users for every month

→**Symbol Maps** – To show the distribution of amount spend by customers across each state of the country

→**Bubble Charts** – To show the relative size of amount spent on each category of purchase by credit card users

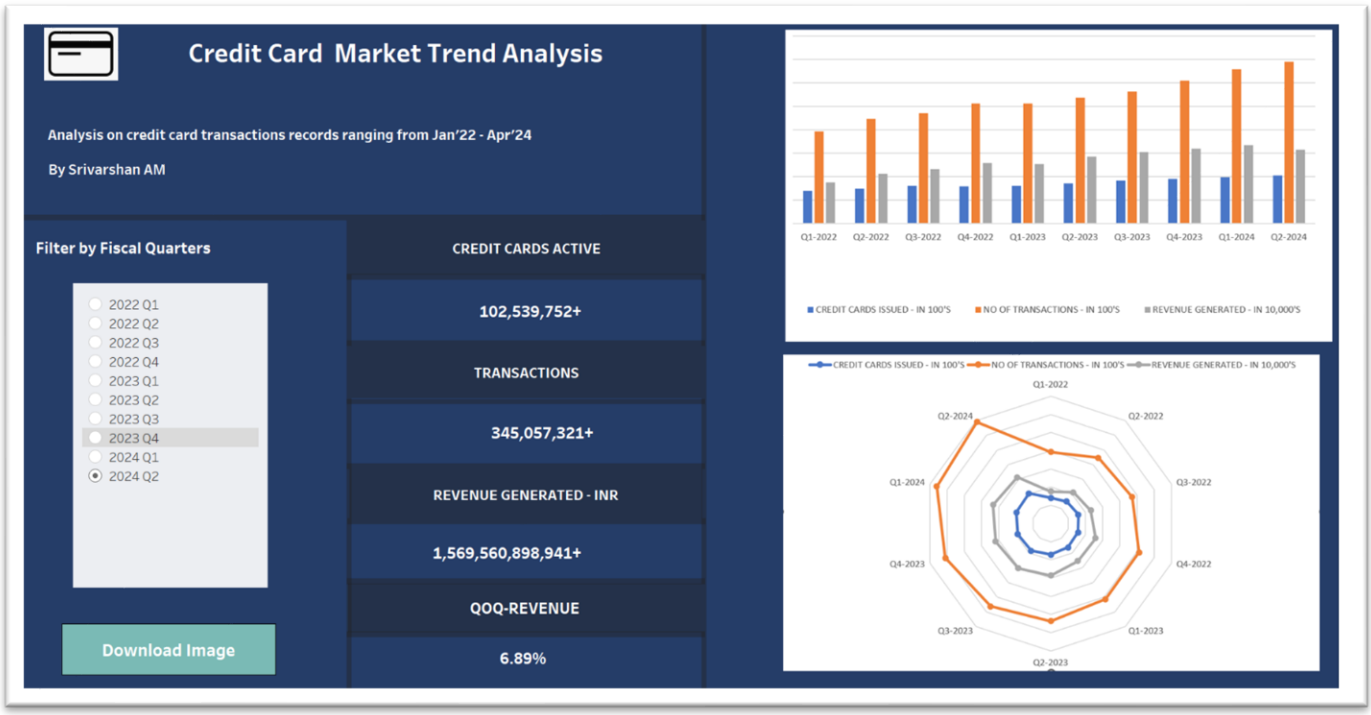

Fig. Dashboard-1

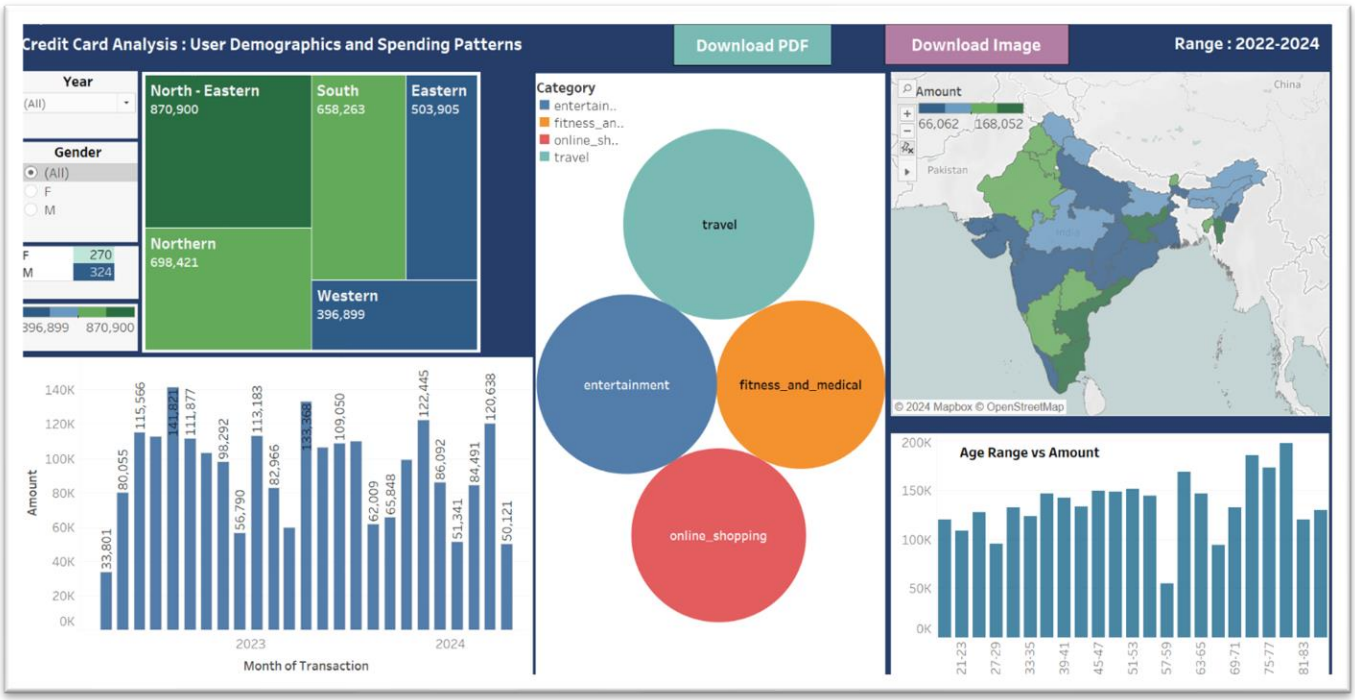

Fig.Dashboard-2

Note:→ Demonstration video of the dashboards' features and final presentation outlining insights of the analysis are uploaded in the [GitHub profile]