Case Study Data Analysis

OPTIMIZING BIKE-SHARING STRATEGIC CAMPAIGNS

Maximizing Annual Membership Numbers

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Introduction

Cyclistic is a bike-sharing company in Chicago. Cyclistic has a bike share program that includes more than 5,800 bikes and 600 docking stations. The bikes can be unlocked from one station and returned to any other station in the system anytime

Problem Statement

Cyclistic's finance analysts have concluded that annual members are much more profitable than casual riders. For this reason, a strategic plan is needed to convert casual riders into annual members.

Business Task

analyze the usage patterns and differences between annual members and casual riders of Cyclistic bikes in order to develop insights that can drive strategic business decisions.

Tools:

DATA ANALYSIS PROCESS

01. **Ask:** Define the problem, ask effective questions and set goals

02. **Prepare:** Collect and store data for analysis

03. **Process:** Clean and transform data to ensure integrity

04. **Analyze:** Use data analysis tools to draw conclusions

05. **Share:** Interpret results to others to make data-driven decisions

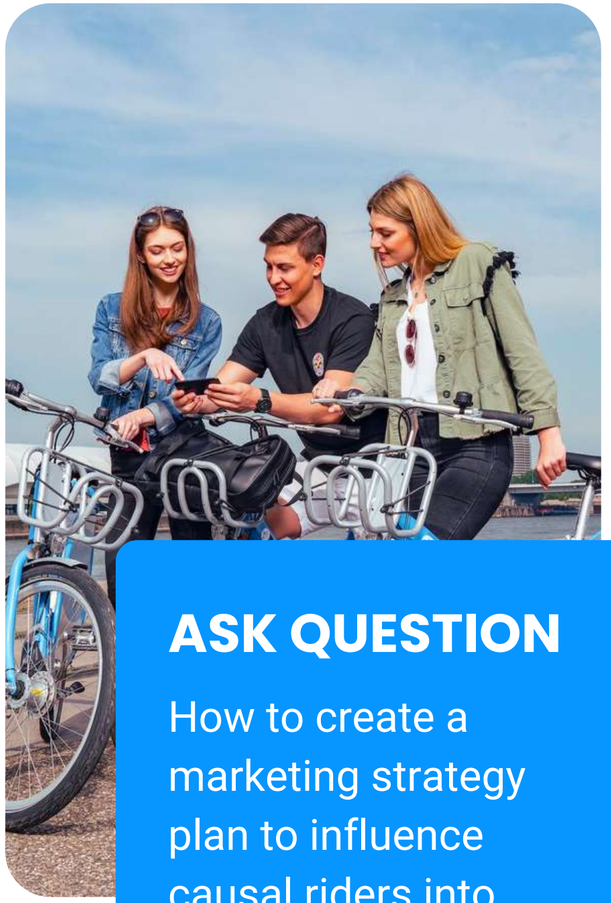
06. **Act:** Put insights to work in order to solve the original problem

Ask Phase

Define the problem, ask effective questions dan set goals.

DEFINE THE PROBLEM

Company wants more profit to expand the business, finance analysts have concluded that annual members are much more profitable than casual riders. maximizing the number of annual members will be key to future growth.



ASK QUESTION

How to create a marketing strategy plan to influence causal riders into annual members ?

SET GOALS

Identify opportunities for increasing annual membership and improving marketing strategies to drive growth and profitability.

Prepare Phase

Collect and store data for analysis

Data Overview

The data consists of 12 CSV files, which represent each month

The data consists of 5,674,399 rows and 13 columns

Data was recorded for a year, from October 2022 to September 2023

Data Source

This data was obtained on the Kaggle website, The data has been made available by **Motivate International Inc**. under this license.

Data Features

ID Feature

- ride_id
- start_station_id
- end_station_id
- start_station_name
- end_station_name

Categorical Feature

- rideable_type
- member_casual

Date Feature

- started_at
- ended_at

Spatial Feature

- start_lat
- start_lng
- end_lat
- end_lng

Process Phase

Clean and transform data to ensure integrity

Source Code

Drop Missing Value & Change Data Type

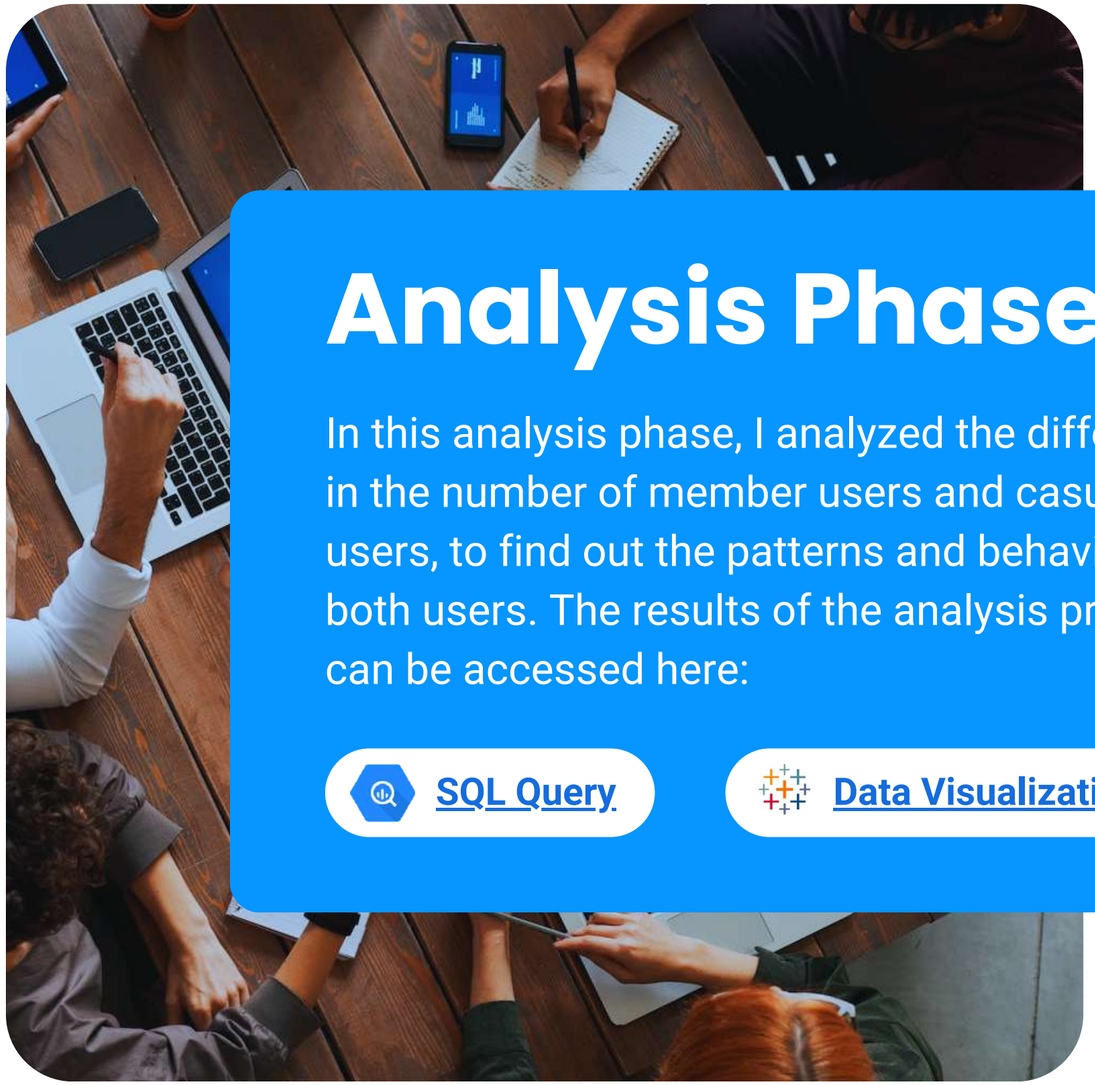
Missing values in data entries should be resolved by deleting them. Changing the data type of the date column to datetime will improve data cleanliness and quality.

Added New Columns to Get More Insights

Added day_name and minute_duration columns to provide richer and more relevant analysis dimensions to support better understanding of the data.

Removes Duration Anomaly Values

Deleting durations below 0 minutes and above 1440 minutes (1 hour), to maintain data accuracy, by ensuring that we focus on relevant and realistic time frames



Analysis Phase

In this analysis phase, I analyzed the difference in the number of member users and casual users, to find out the patterns and behavior of both users. The results of the analysis process can be accessed here:

SQL Query

Data Visualization

01 DIFFERENCE TOTAL USERS

Analyze the total difference between member and casual users, to understand the patterns and behavior of both users.

02 BASED ON SPECIFIC TIME

Analyze both users' bike usage, such as month, day of week, hour, and trip duration to understand trends based on time.

03 ANALYZE ROUTE

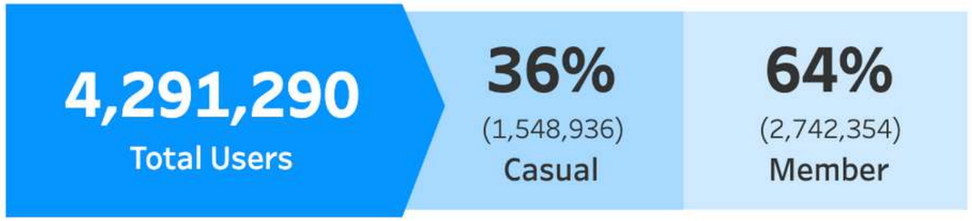
Analyze the routes frequently traveled by both users, to create strategic potential based on place.

Differences in Bike Users

Understand the comparison of the number of member users and casual users

Casual Member

Total Member Users & Casual Users



There is a majority of Bike-Sharing users who have joined as members, reaching 64%, while casual riders reach 36%. This phenomenon not only reflects consistent member growth but also shows that there is an opportunity to further expand the reach of services to casual users in order to increase their participation.

Total Users by Bike Type

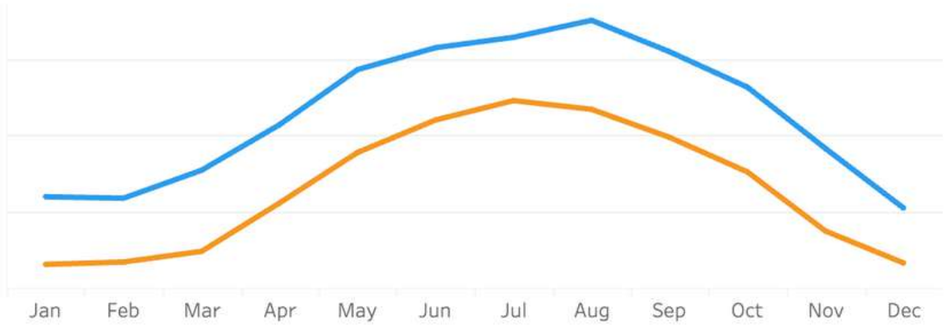
Member users and casual riders show similar preferences by preferring classic bikes, while docked bikes tend to be the exclusive choice for casual users. This dynamic not only reflects the popularity of classic bikes among both user groups, but also underscores differences in needs and preferences,

Analysis Based on a Certain Time

Understand the comparison of the number of member users and casual users

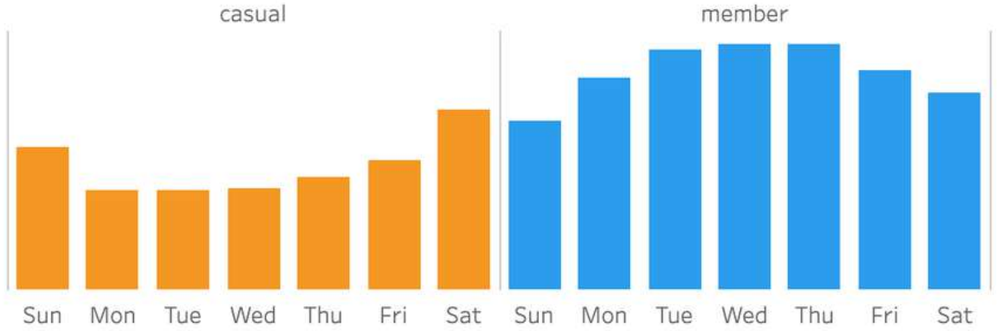
Casual Member

Total Users by Month



Bike-sharing use by annual members and casual riders peaks in June, July, and August, and declines in December, January, and February. This is related to the change of seasons, where in summer more people use the service than in winter.

Total Users by Day of Week



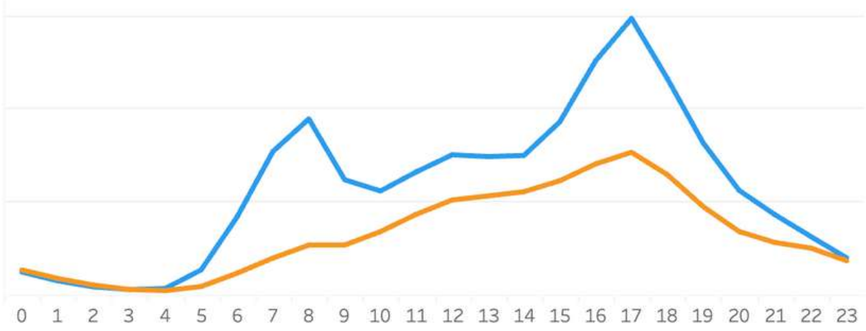
Casual riders tend to be more active on weekends, with peak usage on Saturdays and Sundays. Meanwhile, annual members use the service more often on weekdays, especially on Thursdays, Wednesdays, and Tuesdays.

Differences in Bike Users

Understand the comparison of the number of member users and casual users

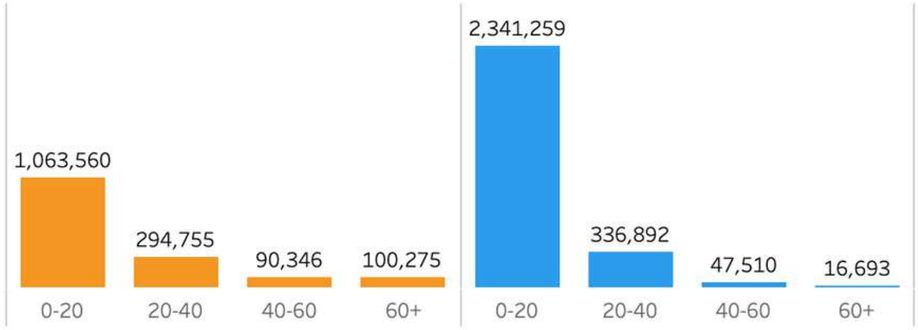
Casual Member

Total Users by Hour

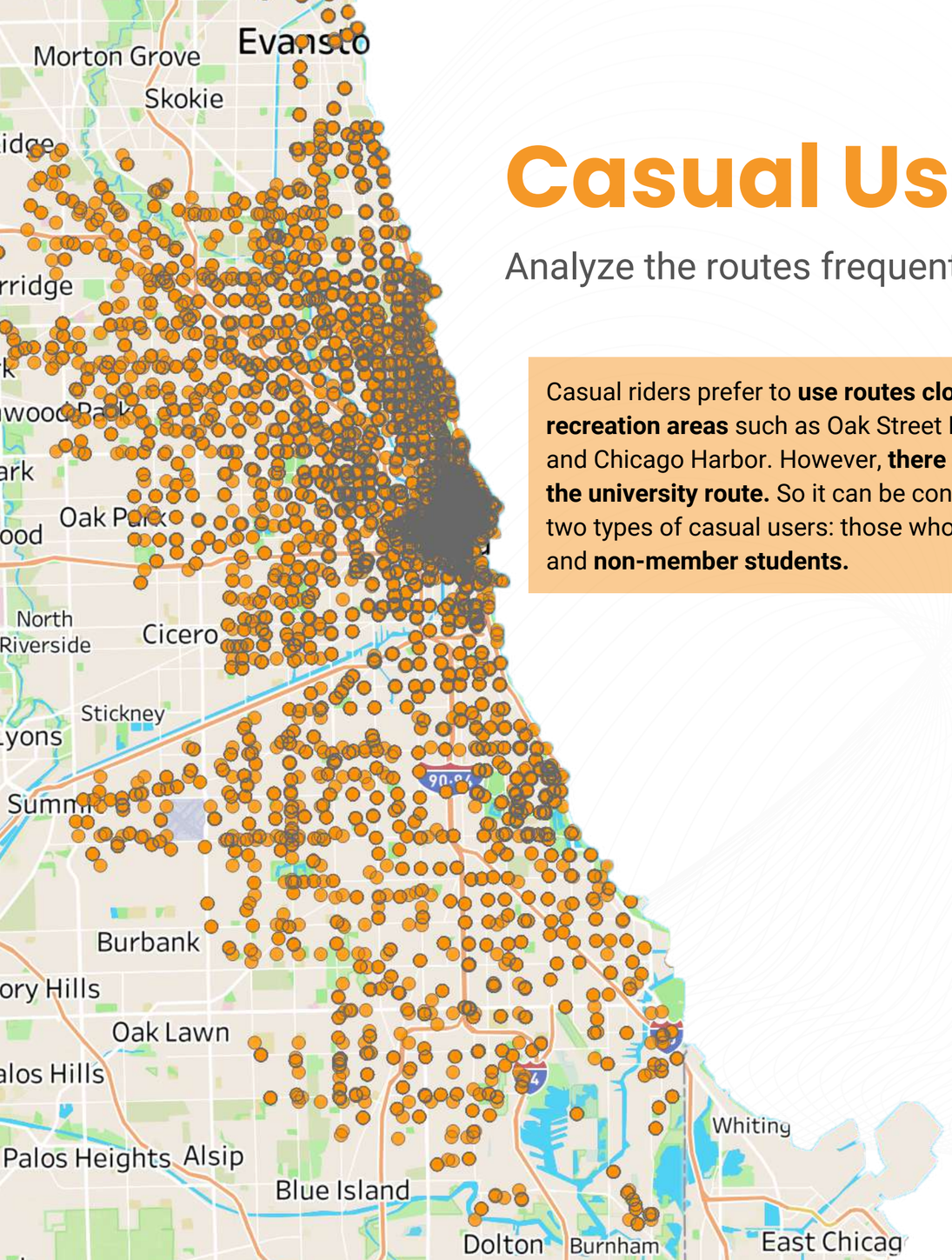


Member users tend to prefer the bikes in the afternoon, with a significant number also seen in the morning, while some also utilize them during the day. On the other hand, casual riders are more likely to take a bicycle, especially during the day and evening. This discovery creates a deeper understanding of users' time preferences.

Total Users by Duration in Minutues



In the period of 0-20 minutes, both groups, both members and casual riders, showed equally high peaks in service usage. However, when looking at longer durations of use, it appears that casual riders have a slightly greater tendency to use services for more than 60 minutes compared to the 40-60 minutes time range.



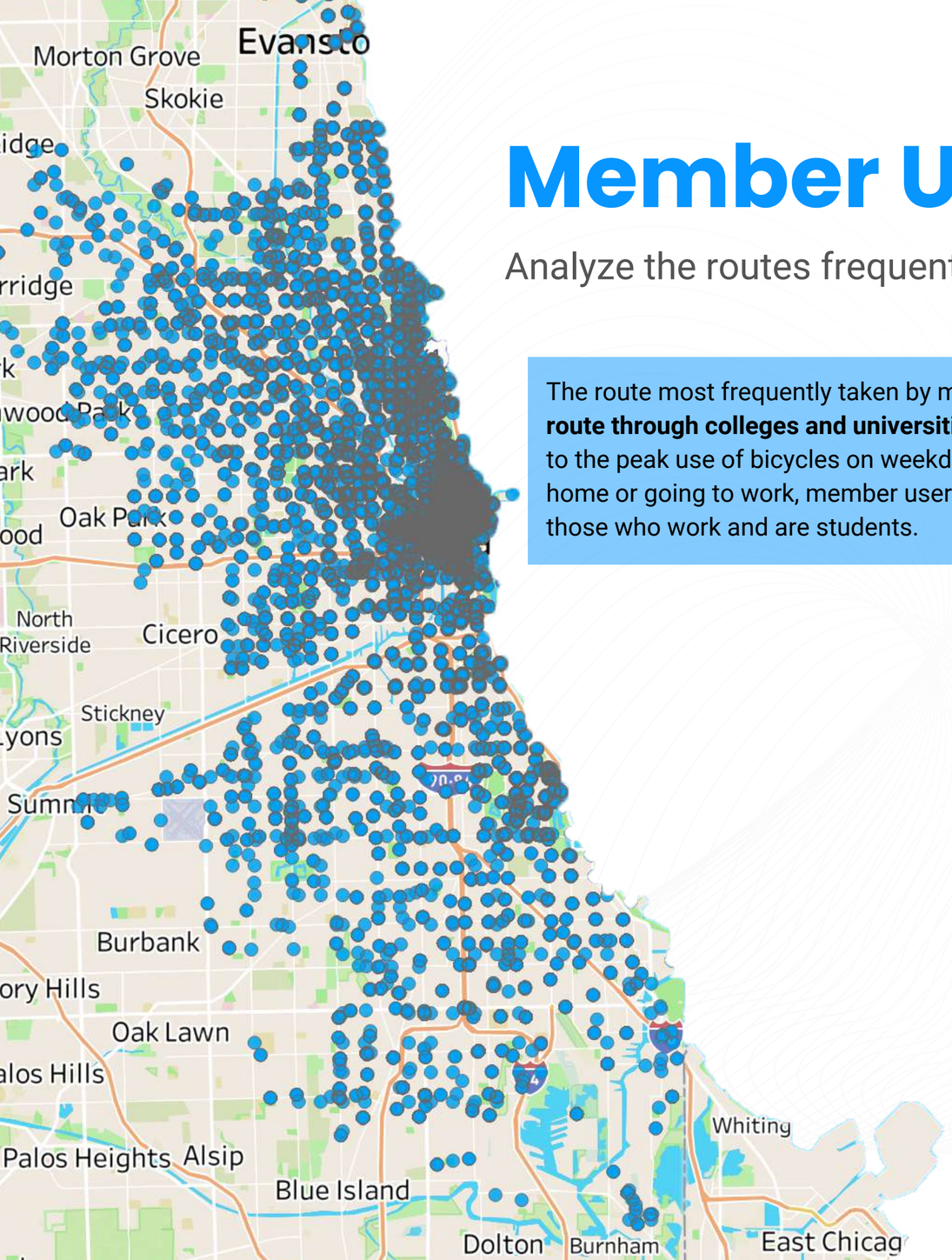
Casual User Routes

Analyze the routes frequently taken by casual users

Casual riders prefer to **use routes closer to water and recreation areas** such as Oak Street Beach, Millennium Park and Chicago Harbor. However, **there are also those who use the university route.** So it can be concluded that there are two types of casual users: those who cycle **for recreation** and **non-member students.**

TOP 20 CASUAL USER ROUTE

Route	
Streeter Dr & Grand Ave > Streeter Dr & Grand Ave	8,946
DuSable Lake Shore Dr & Monroe St > DuSable Lake Shore Dr & Monroe St	6,861
DuSable Lake Shore Dr & Monroe St > Streeter Dr & Grand Ave	4,777
Michigan Ave & Oak St > Michigan Ave & Oak St	4,311
Millennium Park > Millennium Park	3,540
Dusable Harbor > Dusable Harbor	2,704
Montrose Harbor > Montrose Harbor	2,496
Streeter Dr & Grand Ave > DuSable Lake Shore Dr & Monroe St	2,437
DuSable Lake Shore Dr & North Blvd > DuSable Lake Shore Dr & North Blvd	2,079
Ellis Ave & 60th St > Ellis Ave & 55th St	1,995
Theater on the Lake > Theater on the Lake	1,932
Ellis Ave & 55th St > Ellis Ave & 60th St	1,813
Ellis Ave & 60th St > University Ave & 57th St	1,460
University Ave & 57th St > Ellis Ave & 60th St	1,254
University Ave & 57th St > Kimbark Ave & 53rd St	893
Kimbark Ave & 53rd St > University Ave & 57th St	830
Loomis St & Lexington St > Morgan St & Polk St	295
Calumet Ave & 33rd St > State St & 33rd St	255
State St & 33rd St > Calumet Ave & 33rd St	250
Morgan St & Polk St > Loomis St & Lexington St	248



Member User Routes

Analyze the routes frequently taken by member users

The route most frequently taken by member users is the **route through colleges and universities.** In direct proportion to the peak use of bicycles on weekdays and when going home or going to work, member users are dominated by those who work and are students.

TOP 20 MEMBER USER ROUTE

Route	
Ellis Ave & 60th St > University Ave & 57th St	6,064
Ellis Ave & 60th St > Ellis Ave & 55th St	5,621
University Ave & 57th St > Ellis Ave & 60th St	5,579
Ellis Ave & 55th St > Ellis Ave & 60th St	5,390
State St & 33rd St > Calumet Ave & 33rd St	4,681
Calumet Ave & 33rd St > State St & 33rd St	4,637
Loomis St & Lexington St > Morgan St & Polk St	3,572
Morgan St & Polk St > Loomis St & Lexington St	3,261
University Ave & 57th St > Kimbark Ave & 53rd St	2,536
Kimbark Ave & 53rd St > University Ave & 57th St	2,260
Streeter Dr & Grand Ave > Streeter Dr & Grand Ave	1,410
Michigan Ave & Oak St > Michigan Ave & Oak St	995
DuSable Lake Shore Dr & Monroe St > DuSable Lake Shore Dr & Monroe St	837
DuSable Lake Shore Dr & North Blvd > DuSable Lake Shore Dr & North Blvd	781
Theater on the Lake > Theater on the Lake	746
Montrose Harbor > Montrose Harbor	736
DuSable Lake Shore Dr & Monroe St > Streeter Dr & Grand Ave	520
Dusable Harbor > Dusable Harbor	492
Millennium Park > Millennium Park	427
Streeter Dr & Grand Ave > DuSable Lake Shore Dr & Monroe St	421

Characteristics of Both User

Casual Users

- **Bicycle preferences:** Prefer classic bike, with some using docked bike.
- **Service usage activity:** Peak activity in the middle of the year, lower at the beginning and end of the year (may be influenced by season).
- **Daily activity:** More active on weekends, especially in the afternoon.
- **Frequently traveled routes:** Choose recreational routes such as parks and beaches.

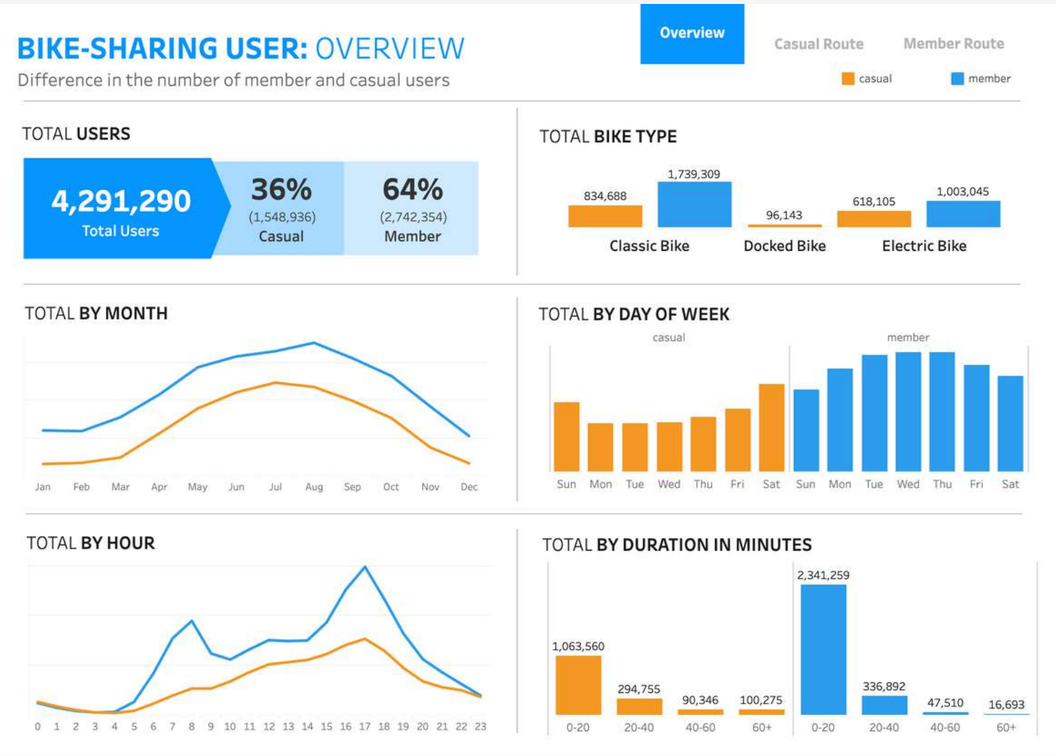
Member Users

- **Bicycle preferences:** Prefer classic bike, without using docked bike.
- **Service usage activity:** Peak activity in the middle of the year, lower at the beginning and end of the year (may be influenced by season).
- **Daily activity:** Be more active on weekdays, especially in the morning and evening.
- **Frequently taken path:** Choosing a path to college and university.

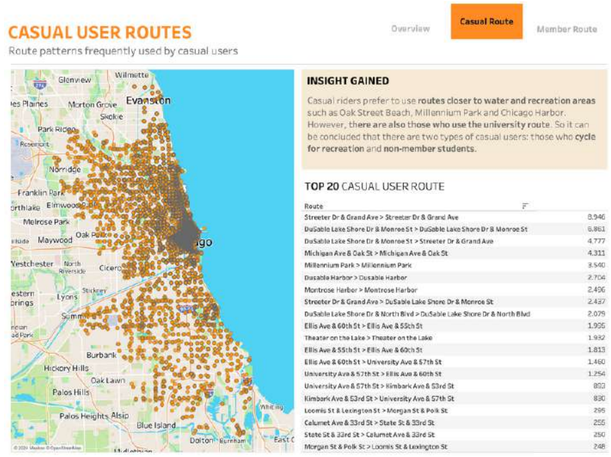
Share Phase

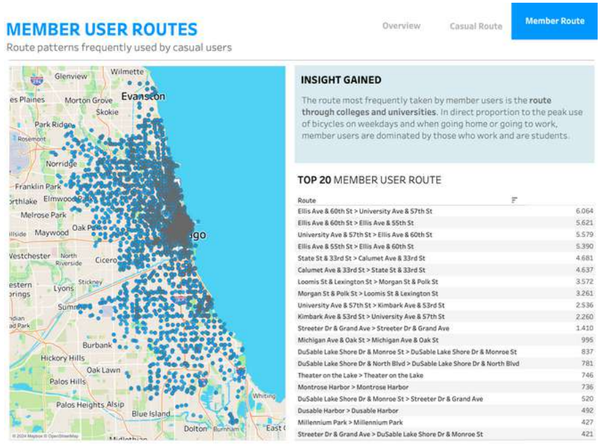
Interpret results to others to make data-driven decisions by creating dashboards using Tableau.

Bike-Sharing User: Overview



Frequently traveled routes





Act Phase: Marketing Strategy

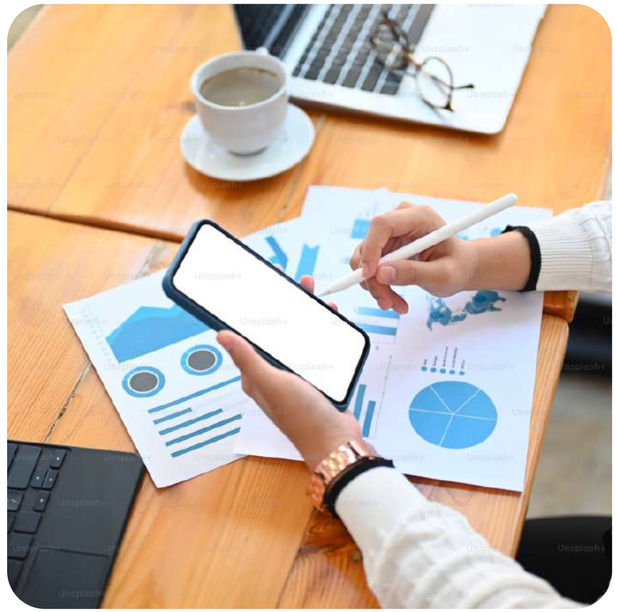
Increase the number of member users, by influencing casual users to become members

Special Discounts and Promotions

Offer discounts or special offers and create membership packages with additional benefits to increase appeal.

Campaign Benefit and Collaboration

Campaign membership benefits and collaborate with local businesses to provide additional incentives for member users.



Exclusive and Personalized Events

Hold exclusive events and tours for member users. Use user data to create personalized promotions and match the habits of regular users.

Hi, I am

Muhammad Fadli Syukur

Data Analyst

An informatics engineering graduate with a passion for data, currently working on a case study project to improve analytical skills and contribute to the data industry. Ready to apply my passion and skills in a professional environment.

My Portfolio

Visualization Gallery

Let's Connect

THANKS

References

- Cyclistic Customer Analysis - StefanusYudi
- Cyclistic Bike-Share - Viacheslav Kyrylenko
- Photo Assets from unsplash.com
- Icon Assets from freepik.com