Case Study: How Does a Bike-Share Navigate Speedy Success?

Data Analysis Report

Prepared by

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About the company

In 2016, Cyclistic launched a successful bike-share offering. Since then, the program has grown to a fleet of 5,824 bicycles that are geotracked and locked into a network of 692 stations across Chicago. The bikes can be unlocked from one station and returned to any other station in the system anytime

Cyclistic's bike sharing program has three pricing plans: single-ride passes, full-day passes, and annual membership. The flexibility of these pricing plans has boosted the brand awareness and attracted more customers since its introduction.

Financial analysts concluded annual members are much more profitable than casual riders and conversion of casual rider to annual riders is the key to future growth. In order to do, the marketing analyst team needs to understand how annual members and casual riders differ.

Scenario

You are a junior data analyst working in the marketing analyst team at Cyclistic, a bike-share company in Chicago. The director of marketing believes the company's future success depends on maximizing the number of annual memberships. Therefore, your team wants to understand how casual riders and annual members use Cyclistic bikes differently. From these insights, your team will design a new marketing strategy to convert casual riders into annual members. But first, Cyclistic executives must approve your recommendations, so they must be backed up with compelling data insights and professional data visualizations.

Moreno has assigned you the first question to answer: How do annual members and casual riders use Cyclistic bikes differently?

Business Task

Analysis of casuals riders and annual member's bike shares usage patterns to inform of marketing strategies for the membership conversion program.

Tools: R for data cleaning, Microsoft Power Bi for data visualization.

Dataset: Cyclistic's historical trip data from April 2020 to April 2021

Results

Here is what I found from the data:

1. Total trip duration and number of trips were highest at the weekends and peaked in July.

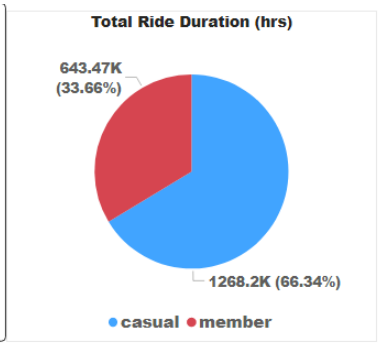
2. Total trip duration for casual riders is 1.97 times higher than the total trip duration of members.

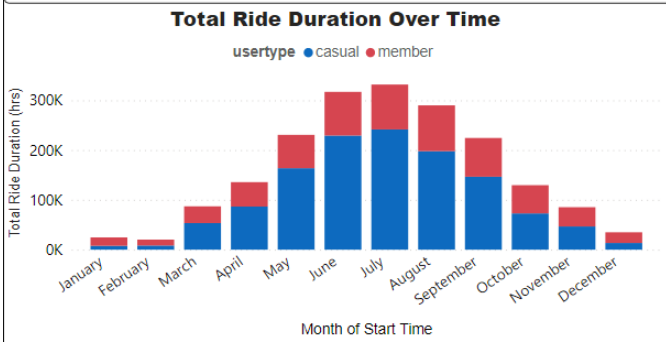
3. Casual riders have a higher average trip duration (31.2 mins) compared to members (14.4 mins).

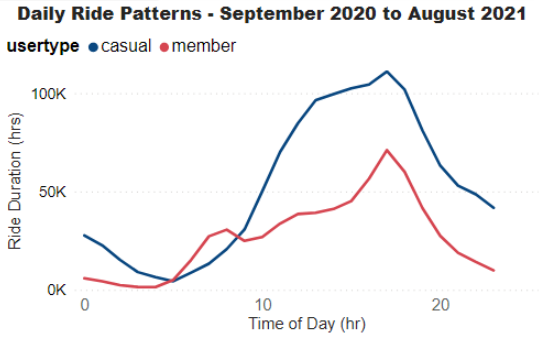
4. Total trip duration increased significantly in the afternoon and evening.

Total Trip Duration Summary (hrs)

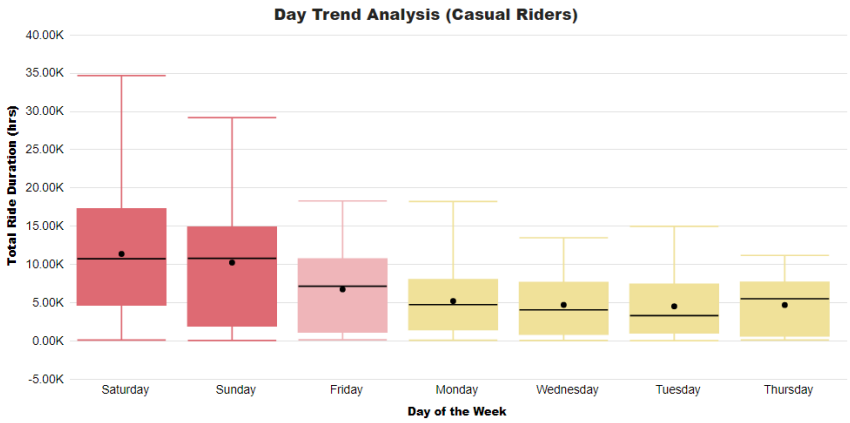
usertype	Friday	Monday	Saturday	Sunday	Thursday	Tuesday	Wednesday	Total
member	93,608.42	84,090.25	103,584.58	92,073.20	87,632.78	90,236.78	92,240.25	643,466.27
classic_bike	45,768.43	45,035.92	54,435.17	49,744.48	43,862.15	47,260.60	46,051.72	332,158.47
docked_bike	19,487.60	15,269.32	19,889.10	17,534.38	17,628.55	17,062.90	19,569.15	126,441.00
electric_bike	28,352.38	23,785.02	29,260.32	24,794.33	26,142.08	25,913.28	26,619.38	184,866.80
casual	175,552.07	141,067.75	307,245.35	276,785.38	122,357.38	122,391.43	122,797.07	1,268,196.43
classic_bike	60,190.28	50,313.12	114,754.50	103,058.47	43,589.37	44,076.53	41,256.55	457,238.82
docked_bike	76,221.37	58,876.62	136,745.82	124,186.32	48,228.17	47,300.38	51,739.70	543,298.37
electric_bike	39,140.42	31,878.02	55,745.03	49,540.60	30,539.85	31,014.52	29,800.82	267,659.25
Total	269,160.48	225,158.00	410,829.93	368,858.58	209,990.17	212,628.22	215,037.32	1,911,662.70

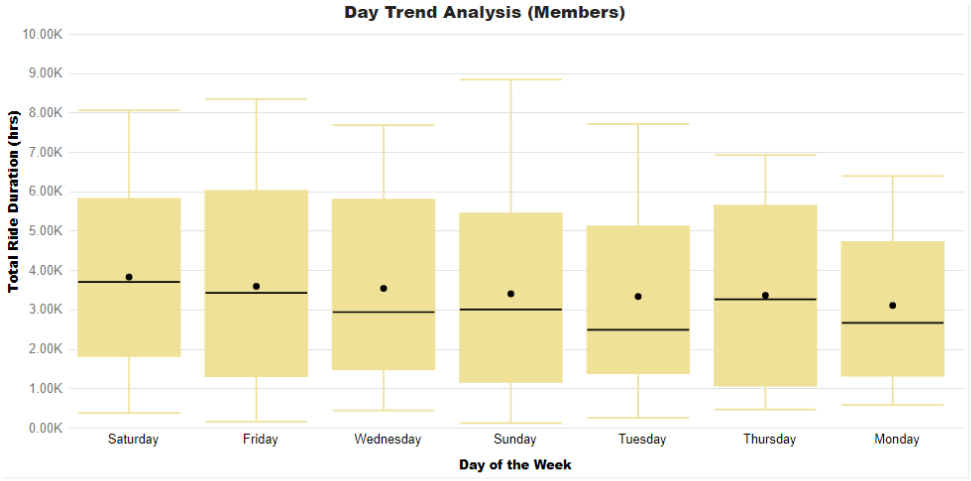




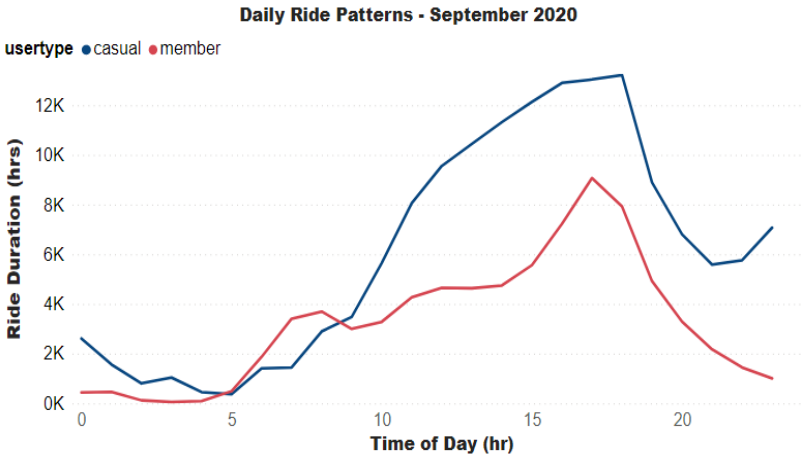


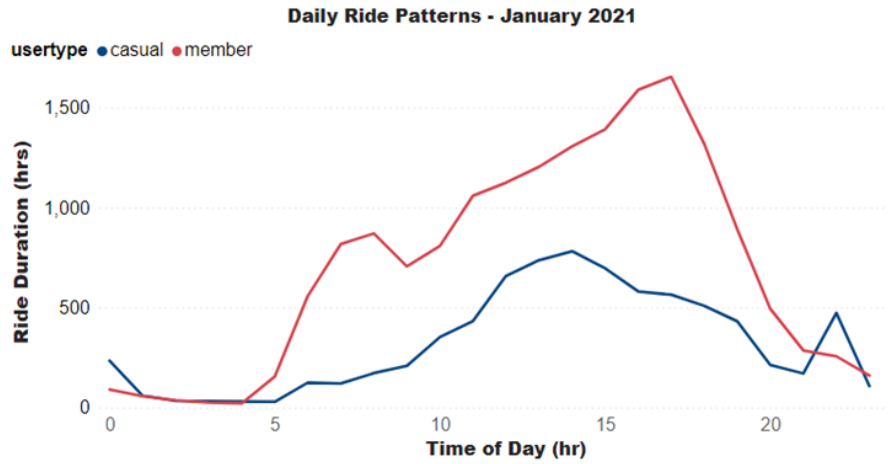
We can see from the bar chart above the majority of bike trips occurred in the summer and they decreased significantly during the winter period.

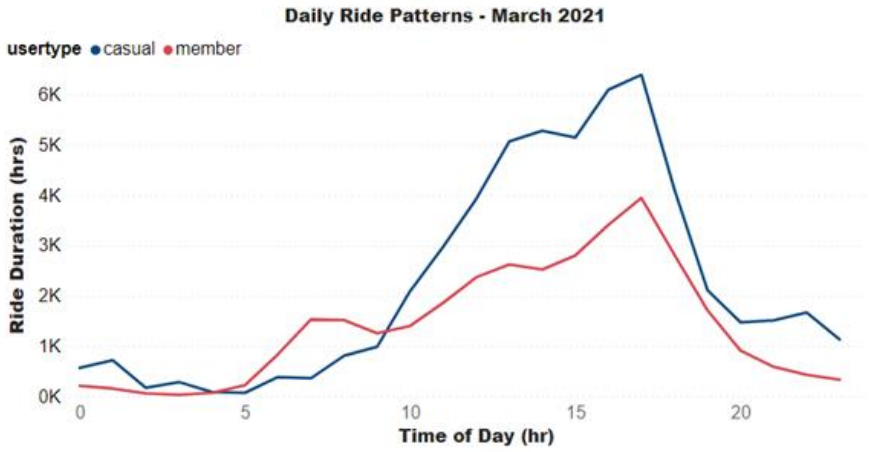


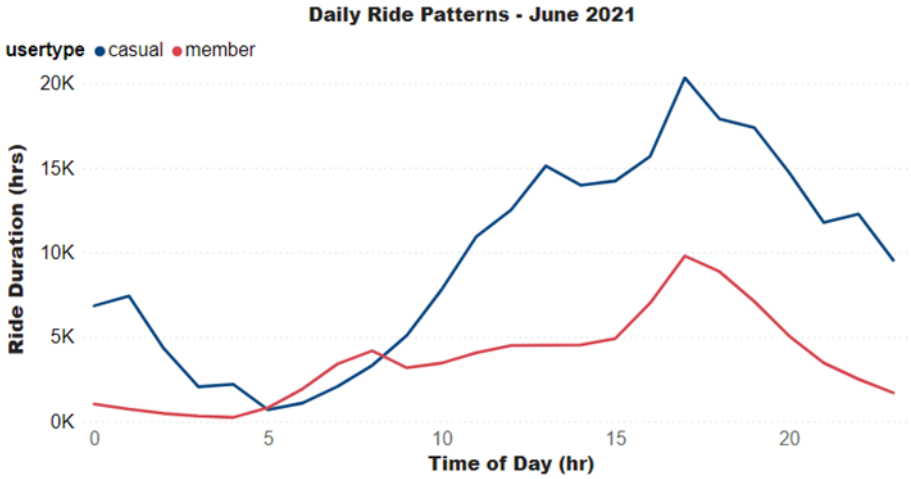


We can see from the box plots, the total trip duration of casual users is significantly higher on the weekends, whilst the total trip duration of members is constant throughout the week.



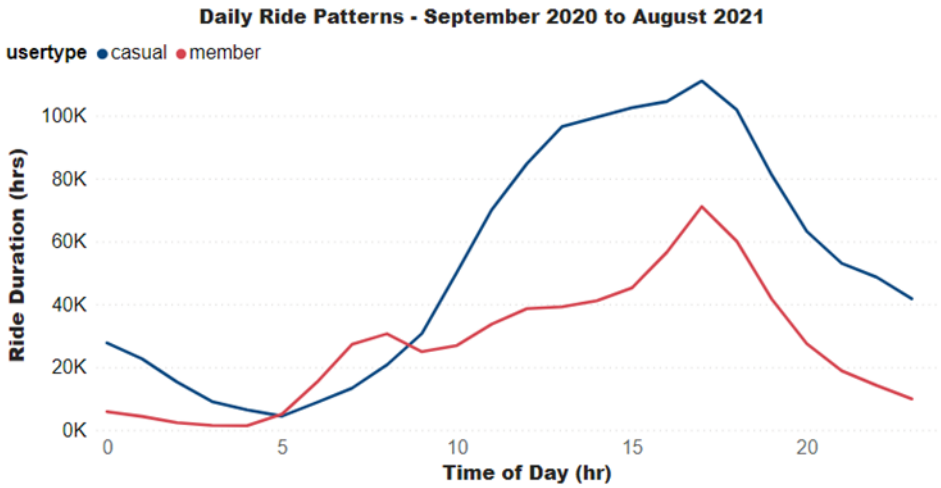






Summary

In summary, the total trip duration for casual users and members are affected by season. During the winter season, the temperature is low and people are less likely to go outside. Those that require to commute to work most likely will use other forms of public transport. Consequently, the total trip duration is the lowest during the winter season.



Throughout the year, we see a sharp increase in the total trip duration in the afternoon and evenings at around 5 p.m. Many schools finish in the afternoon and many workers finished around 5 p.m, thus this could explain the increase in trip duration around this time. This is further substantiated by the two peaks observed for annual members which is at 7 a.m and 5 p.m, this mostly likely indicates many annual members are office workers.

Top 20 stations visited by Casual Rider

start_station_name	ride_duration_hrs
Streeter Dr & Grand Ave	43,967.03
Millennium Park	33,541.27
Lake Shore Dr & Monroe St	22,437.12
Michigan Ave & Oak St	21,059.42
Shedd Aquarium	14,203.08
Theater on the Lake	13,699.67
Dusable Harbor	13,454.90
Indiana Ave & Roosevelt Rd	13,022.18
Buckingham Fountain	12,909.27
Michigan Ave & Lake St	12,816.03
Wabash Ave & Grand Ave	12,670.85
Lake Shore Dr & North Blvd	12,210.38
Michigan Ave & Washington St	11,922.48
Michigan Ave & 8th St	11,117.33
Fairbanks Ct & Grand Ave	9,406.75
Wabash Ave & Wacker Pl	9,037.85
Columbus Dr & Randolph St	8,946.80
Lake Shore Dr & Ohio St	8,445.40
Montrose Harbor	8,109.98
St. Clair St & Erie St	7,832.00

Top 20 stations visited by Members

start_station_name	ride_duration_hrs
Theater on the Lake	5,953.70
Streeter Dr & Grand Ave	5,545.88
Clark St & Elm St	5,276.43
Michigan Ave & Oak St	4,795.25
St. Clair St & Erie St	4,683.12
Wells St & Concord Ln	4,593.20
Lake Shore Dr & North Blvd	4,192.20
Broadway & Barry Ave	4,176.97
Lakefront Trail & Bryn Mawr Ave	4,128.23
Dearborn St & Erie St	4,073.37
Burnham Harbor	3,961.62
Clark St & Armitage Ave	3,824.90
Wabash Ave & Grand Ave	3,794.78
Wells St & Elm St	3,715.80
Kingsbury St & Kinzie St	3,699.40
Clark St & Lincoln Ave	3,626.83
Indiana Ave & Roosevelt Rd	3,570.82
Lake Shore Dr & Monroe St	3,348.97
Montrose Harbor	3,291.62
McClurg Ct & Erie St	3,267.37

The top 20 stations visited by casual bikes users are popular tourist locations in Chicago, thus casual users are mostly likely are tourists, family, couples and students. Whereas, annual members visit various stations around the city evenly.

Based on the data analysis, my suggestion would be to launch the new marketing campaign during the summer season and consider introducing seasonal passes to increase the conversions.