Case Study: How does a Bike-Share Navigate Speedy Success

Charlie Robson

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Introduction

My name is Charlie Robson. I have a degree in Industrial Engineering from Oklahoma State University, and I am trying to start a career in Data Analysis. This case study is to be my capstone project for the Google Data Analytics Professional Certificate. The scenario for the case study is described below, for now I will describe some of the skills I will use in this case study. I will clean and prepare data for analysis using R, create data visualizations using Tableau, and use the findings from this analysis to make business recommendations. This document, as well as the R code, will be available on my Github at the following URL: crobson29/bike-case-study (github.com). The data used will not be available on my page due to size limitations, but you can find the data used here, which was used under this license.

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.

Until now, Cyclistic's marketing strategy relied on building general awareness and appealing to broad consumer segments. One approach that helped make these things possible was the flexibility of its pricing plans: single-ride passes, full-day passes, and annual memberships. Customers who purchase single-ride or full-day passes are referred to as casual riders. Customers who purchase annual memberships are Cyclistic members.

Cyclistic's finance analysts have concluded that annual members are much more profitable than casual riders. Although the pricing flexibility helps Cyclistic attract more customers, Moreno believes that maximizing the number of annual members will be key to future growth. Rather than creating a marketing campaign that targets all-new customers, Moreno believes there is a very good chance to convert casual riders into members. She notes that casual riders are already aware of the Cyclistic program and have chosen Cyclistic for their mobility needs.

Moreno has set a clear goal: Design marketing strategies aimed at converting casual riders into annual members. In order to do that, however, the marketing analyst team needs to better understand how annual members and casual riders differ, why casual riders would buy a membership, and how digital media could affect their marketing tactics. Moreno and her team are interested in analyzing the Cyclistic historical bike trip data to identify trends.

The question that has been assigned is this: How do annual members and casual riders use Cyclistic bikes differently?

The Business Task

The problem here is relatively simple: not enough people are buying memberships. Popularity of the company is not in the scope of this project, but the popularity of the membership plan. I am hoping to address this problem by analyzing historical data on rider's usage to help marketing create programs to increase membership from casual riders.

About the Data

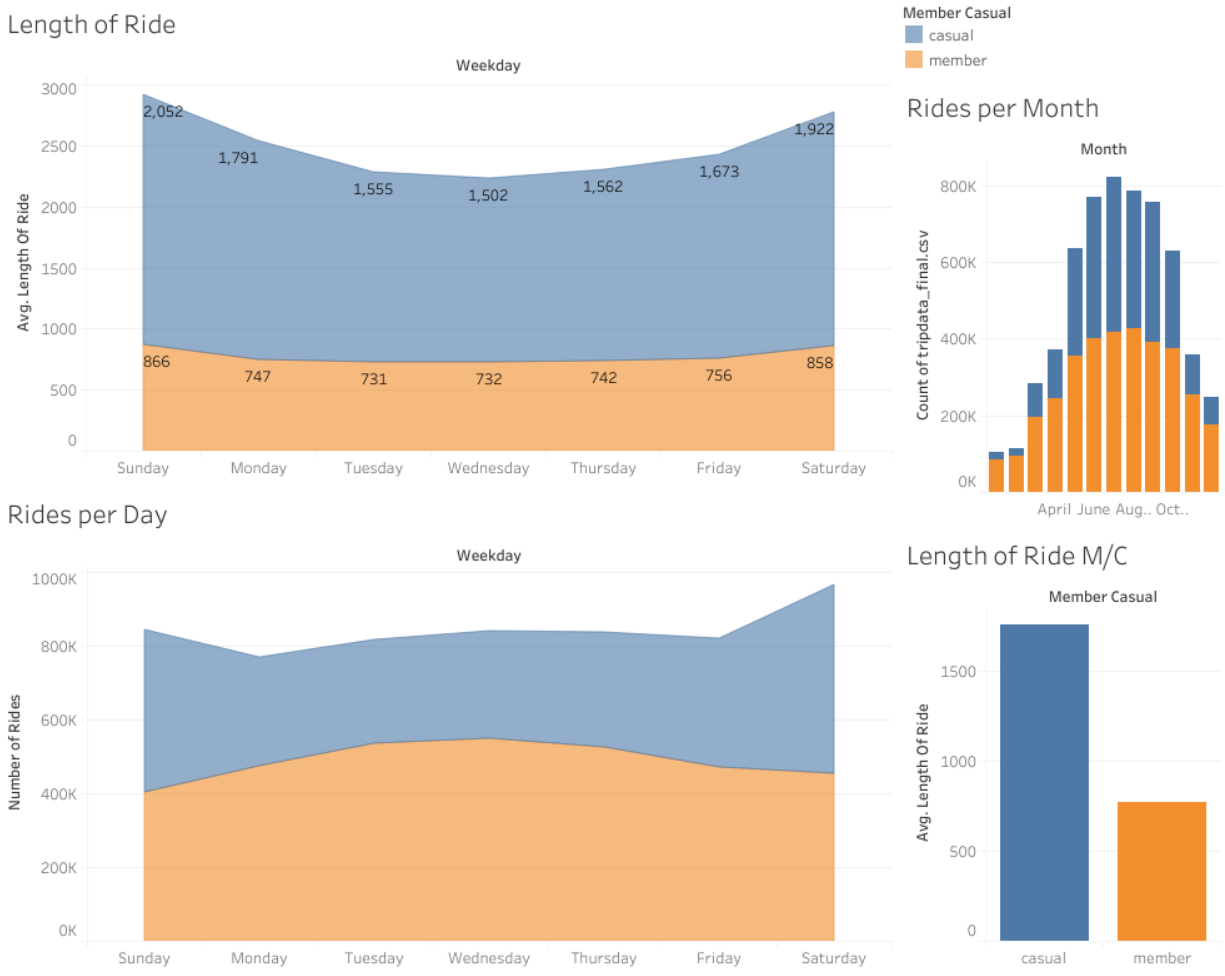
The data that is used in this project is sourced from Motivate International Inc. here under this license. While there is a lot of data in this repository going back several years, for the purposes of this project I will only be using the data from September 2021 to August 2022. The data includes information about the rides, such as the membership status, length of ride, start and stop location, and the type of bike, but

does not include any personal information on the riders. The data is currently organized into separate .csv files for each month, which is not ideal for analysis. The data needs to be cleaned and compiled in order to create the visualizations for the analysis. I will be utilizing R to clean and compile the data. There is a detailed explanation of the cleaning, as well as all the code used, in an R-markdown file called Data Cleaning in the GitHub repository that can be found here. The basic steps are:

- Import the data by month
- Confirm that the columns and datatypes of the data frames match
- Consolidate the monthly data frames into one
- Remove unnecessary columns
- Separate the day, month, year, and trip duration into separate columns
- Check the data for inconsistencies
- Remove inconsistencies
- Export to a .csv file to use Tableau for analysis.

Analysis

Visualizations



Interpretation

Based on the visualizations above, several things are clear to me. First, any marketing based on time of year is not likely to have an impact on converting causal riders to members. Using the bar chart in the middle of the right side of the dashboard, the colder months have significantly less utilization by both members and causal riders, but especially casual riders. There are not many casual riders to convert during these months, so the money and effort would not be very effective, even if it worked perfectly. The second thing that I noticed is that the members are more likely to use the service during the week, and the causal riders are more likely to use the service on the weekends. This leads me to believe that more of the members are using the service as their primary form of transportation. The casual riders that only use the service on the weekend are less likely to buy a membership as it is not cost effective. However, there are many casual riders that use the service during the week as well. The last thing that I immediately noticed was that members typically go for much shorter rides. This could be because the service areas they are in have much higher density, and therefore do not need to travel as long of distances, or it could mean that because they already have a membership, they are using the bikes in situations where they might usually walk.

Conclusions

I have two ideas for how to convert casual riders into members. First, if more people view Cyclistic as a viable for of primary transportation, it will be more cost effective for them to buy a membership. The marketing should be focused on causal riders that use the bikes regularly enough during the week, that they might buy a membership in order to use the bikes as their primary transportation.

Second would be to focus on getting people to use Cyclistic bikes instead of walking. If people start using the bikes as a way to get to a location more quickly than they could if they walked, they will be more likely to buy a membership since paying for the short rides would become expensive very quickly.