Cyclistic Membership Upgrade Analysis

Data Analytics Portfolio Project

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Project Overview & Business Task

Understanding User Behavior to Drive Growth

-Increase long-term profitability by converting cause riders into annual members.
-Identify how annual members and casual riders use Cyclistic bikes differently to inform a targeted marketing strategy.

Key Stakeholder: Lily Moreno, Director of Marketing.

Data Preparation

Data Source & Integrity

-Primary source: Internal historical trip data provided by Motivate International Inc.
-Data Scope: Divvy 2019 Q1 and Divvy 2020 Q1 datasets.
-Key data points: The dataset includes essential fields for behavioral analysis:
-Ride ID, Bike Type, Start/End Time, Start/End Station, and User Type (Member/Casual).
-Data is provided under the Divvy Data License Agreement.
-The data is considered High Quality for this case study- it is Reliable, Original, Comprehensive, and Cited. The data range is a noted limitation, but is appropriate for the defined scope.

Data Cleaning & Manipulation (1/2)

Tools & Workflow:

-The data processing was performed using R in Posit Cloud.
   -Key Packages utilized:
      -Tidyverse (specifically dplyr and lubridate) for data
      manipulation and data functions.
      -janitor for efficient data cleaning.

-The 2019 Q1 and 2020 Q1 CSV files were imported and
combined into a single data frame for an unified analysis.

-The str(), summary(), and head() functions were used to
understand the data structure and identify initial issues like
missing values or incorrect data types.

Data Cleaning & Manipulation (2/2)

Data cleaning & transformation:

-Added Calculated Columns:

    -ride_length: calculated in minutes using difftime() form started_at to ended_at.

    -day_of_week: Extracted from started_at to analyse weekly patterns.

    -month: Extracted from started_at for seasonal analysis.

-Handled Invalid data: Rows removed to ensure analysis accuracy:

    -Negative or zero ride_length (likely system errors or false starts).

    -Missing values (NA) in critical columns like start_station_name, end_station_name, or ride_length.

-Verified Member Type: Confirmed only two user types exist in member_casual column: "member" and "casual".

Outcome:

-The resulting dataset is a clean, valid, consolidated data frame ready for exploratory data analysis and visualization.

Analysis Summary

Methodology:

-Casual riders take trips 7x longer than members (96.2 min vs. 12.7 min)

-The cleaned dataset was analyzed using R to calculate descriptive statistics and aggregate metrics, grouped by user type (member vs casual).

-Key calculations include:

    -Mean ride length, total number of rides, and day-of-week distribution.

Weekend Plot Summary

Casual Riders Peak on Weekends
Ride volume by day of week
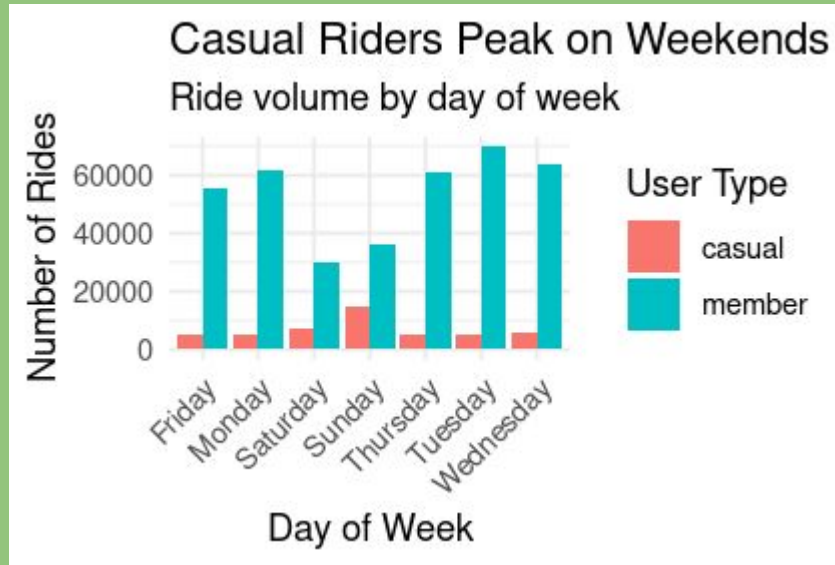
Ride Volume and Usage Patterns:

-Members account for a higher total number of rides overall.
-Casual rides' usage peaks strongly on weekends, while members' usage is more evenly distributed throughout the week.

Average Ride Length Summary

Casual Riders Take Longer Trips
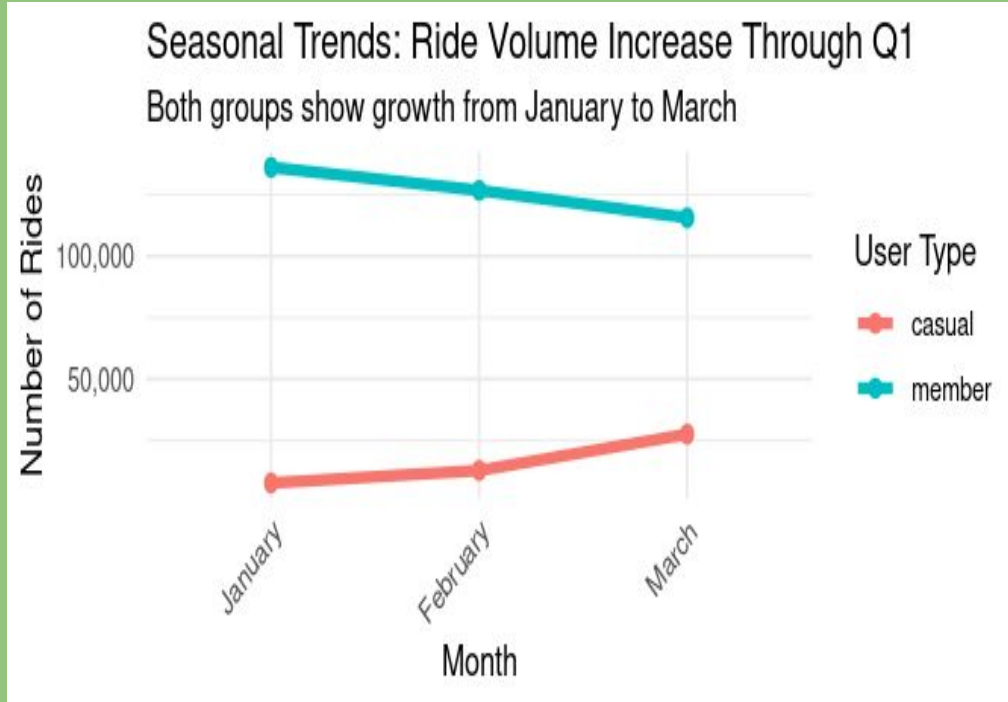Average ride length by user type

Ride duration:
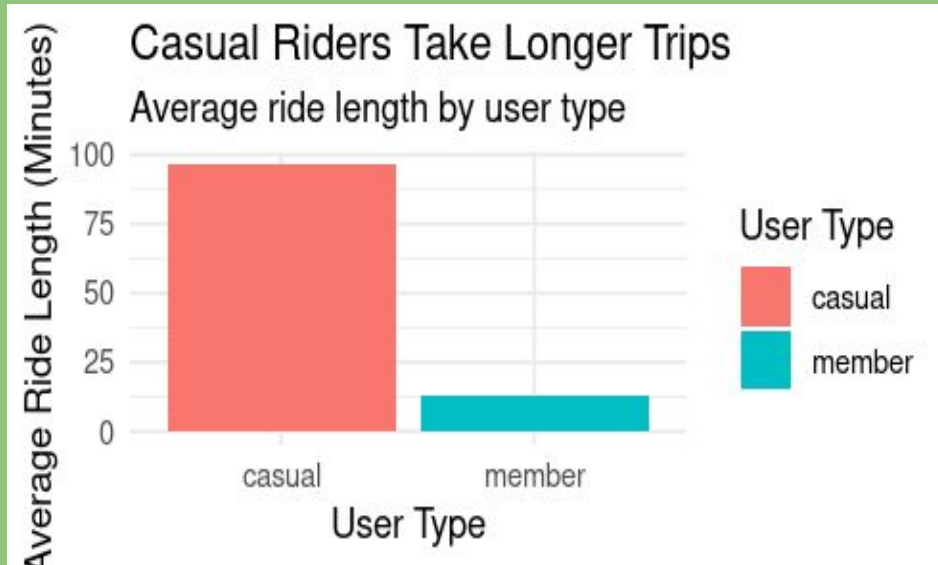
-Casual riders take significantly longer average rides.
-Members have a shorter, more consistent average ride length, suggesting use for regular, commuting.

Seasonal Trend Summary

Seasonal Trends: Ride Volume Increase Through Q1

Both groups show growth from January to March

Seasonality and Bike type preference:

-Analysis based on Q1 (January-March) data reveals foundational patterns. While this provides clear seasonal trends within the quarter, a full-year analysis would capture broader seasonal behaviors.

-Casual riders show a higher relative preference for electric bikes compared to members.

Recommendations

Top Three Recommendations:

1. **Launch a "Weekend Explorer" Membership Campaign:**
   - Target casual riders with digital ads, on Fridays and Saturdays, emphasizing unlimited, long, leisure rides for a flat annual fee. This directly appeals to their proven usage pattern.
2. **Promote electric bikes as a Premium benefit:**
   -Feature electric bikes, using messaging like "Go further with less effort on your weekend adventures."
3. **Create a Seasonal "Summer Pass" Conversion Funnel:**
   -Offer a discounted three-month "Summer Pass" to casual riders, to hook them on convenience of a subscription during their peak riding season, and make them more likely to convert to a full annual membership when the pass expires.