Cyclistic report

Dan

2024-06-02

Business Task

The primary business task is to determine how annual members and casual riders use the company's bikes differently.

Data Sources

The data consists of bike rental records for the year 2019.

Data Cleaning and Manipulation

Loading the Data First, we load the raw datasets for each quarter of 2019. This includes reading the CSV files into R and combining them into a single dataset for the entire year.

Cleaning the Data Next, we perform various cleaning operations on the combined dataset. This involves filtering out records with missing essential information, converting data types, and creating new variables that will be useful for the analysis.

Key steps in this cleaning process include:

Filtering Records: Removing entries with missing from_station_name or to_station_name to ensure each trip has a clear start and end point.

Datetime Conversion: Converting start_time and end_time to datetime objects using ymd_hms() for accurate time-based analysis.

Extracting Date Components: Creating new variables such as start_date, start_hour, start_minute, end_date, end_hour, and end_minute to facilitate detailed time-based analysis.

Calculating Ride Length: Computing the duration of each ride in minutes and rounding it to the nearest minute.

Handling Demographic Data: Converting birth year to a numeric format and calculating the age of each rider. Categorizing gender values into consistent labels (Male, Female, Other).

Handling Missing and Inconsistent Data Valid Ride Lengths: Only rides with a positive duration are included in the analysis.

Complete Demographic Information: Entries with missing user type, age, or gender are removed to maintain the integrity of demographic insights.

Final Dataset Preparation The cleaned dataset is now ready for analysis. The final dataset includes all necessary variables in the appropriate format, ensuring accurate and meaningful analysis results.

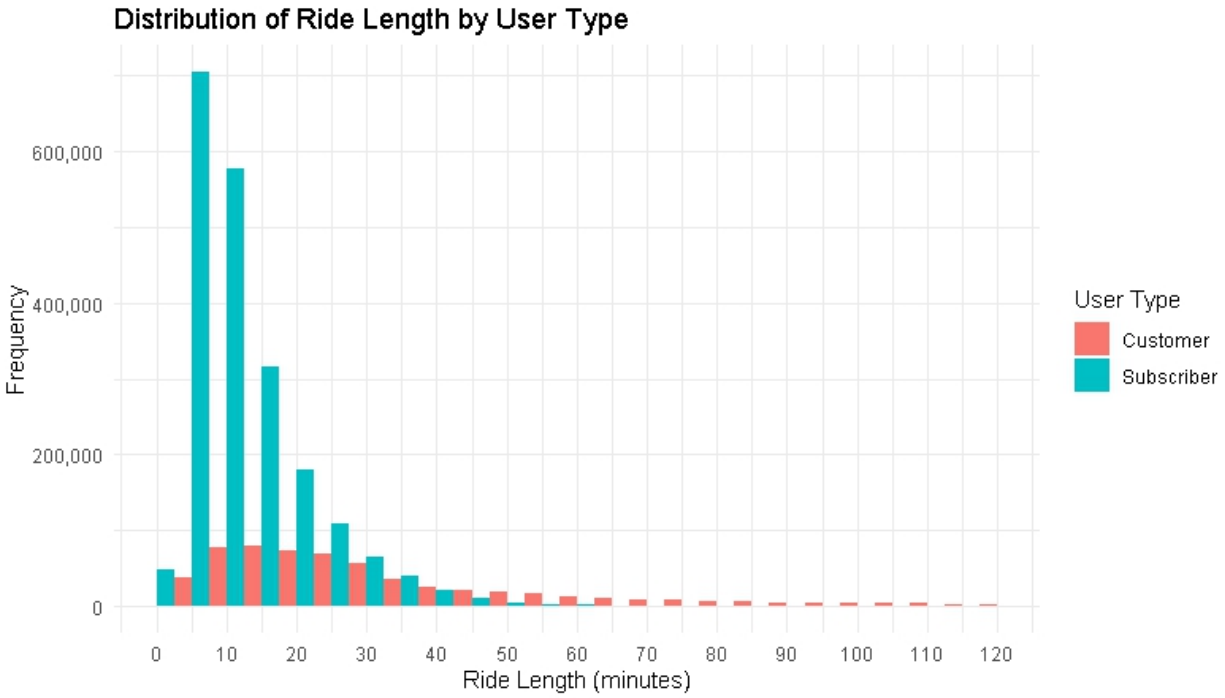
Summary of Analysis

The analysis focused on understanding how annual members and casual riders use the bike-sharing service differently. The key areas of analysis were ride length, usage patterns, and demographic insights.

Ride Length: To compare the duration of bike rides between annual members and casual riders.

Findings:

Distribution of Ride Lengths: The ride lengths for annual members and casual riders show distinct patterns. Annual Members: Tend to have shorter, more consistent ride lengths, often around the average commuting time. This suggests that annual members primarily use the service for regular, short-distance commuting. Casual Riders: Exhibit a wider range of ride lengths, with a higher proportion of longer rides. This indicates that casual riders may use the bikes for leisure activities or longer trips.



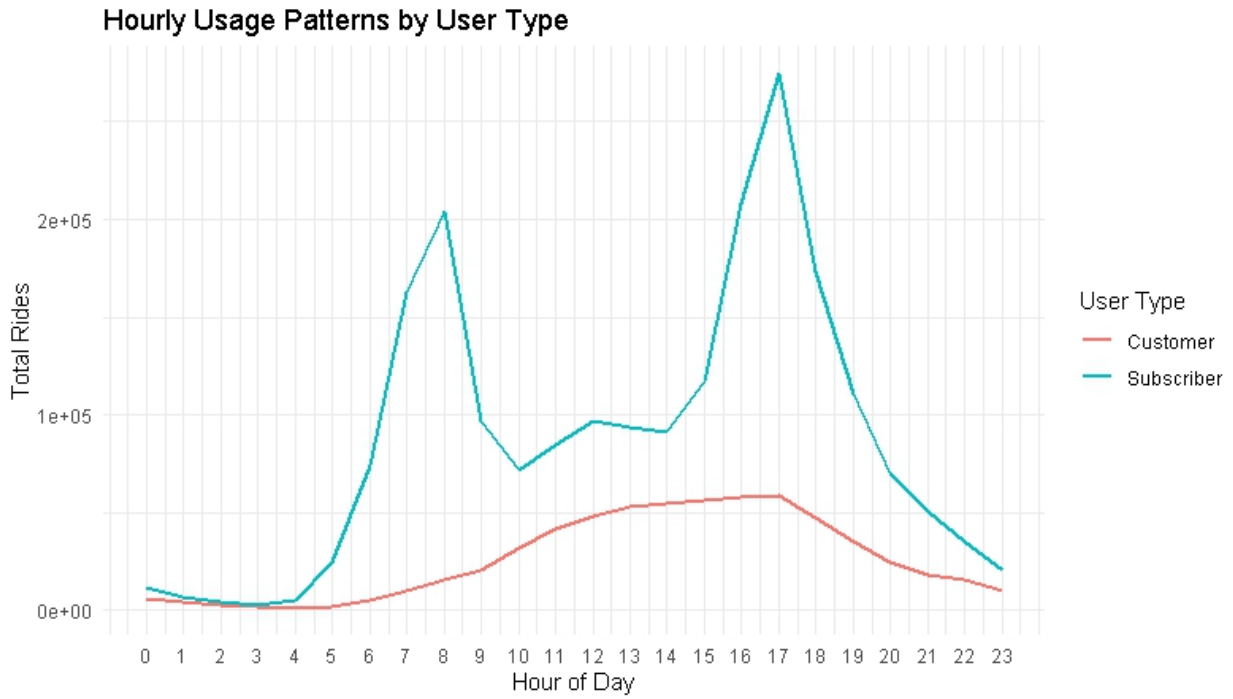
The service appears to be well-suited for the commuting needs of annual members, while it also caters to the more varied usage patterns of casual riders.

Usage Patterns Objective: To understand the hourly and weekly usage patterns of annual members and casual riders.

Findings:

Hourly Usage: Annual Members: Show a peak in usage during typical commuting hours, around 8 AM to 9 AM and 5 PM to 6 PM. This pattern aligns with work commute times.

Casual Riders: Usage is spread more evenly throughout the day, with slight peaks in the late morning and afternoon, suggesting usage for errands, leisure, or sightseeing.



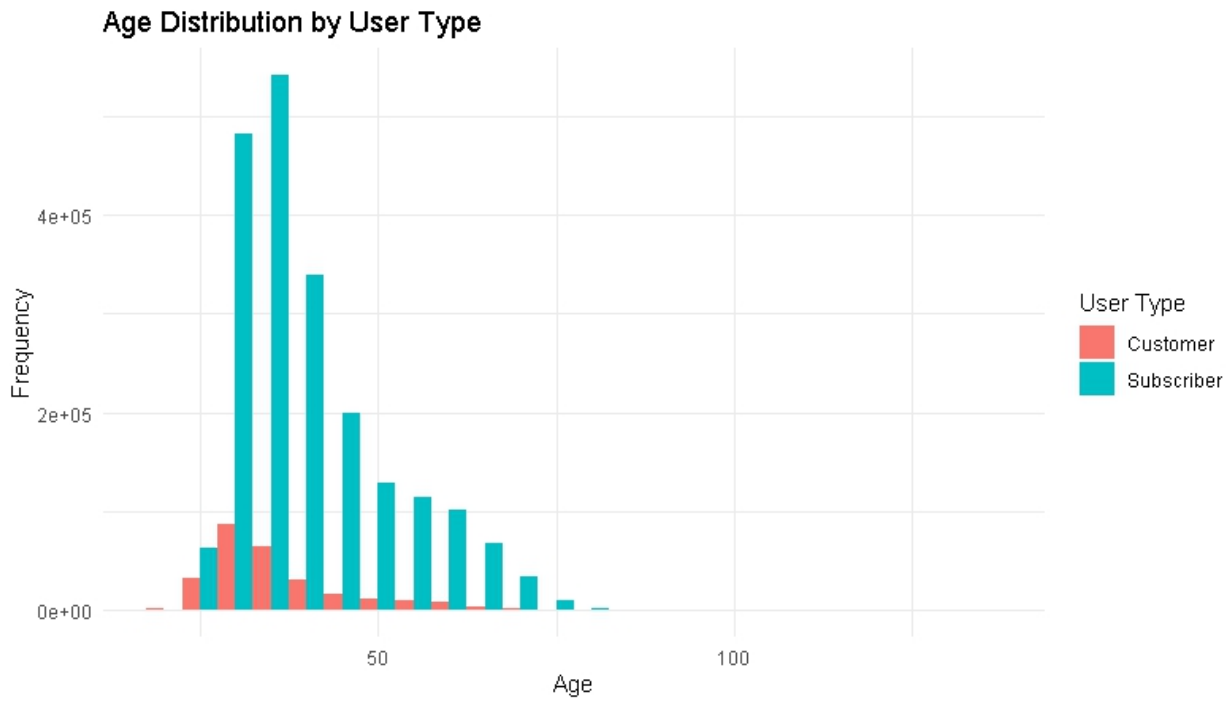
Annual members primarily use the service for commuting, while casual riders use it more flexibly throughout the day.

Weekly Usage: Annual Members: Higher usage on weekdays compared to weekends, indicating regular commuting patterns. Casual Riders: Increased usage during weekends, suggesting recreational use. Demographic Insights Objective: To analyze the age and gender distribution of riders and identify any notable differences between annual members and casual riders.

Demographic Insights Objective: To analyze the age and gender distribution of riders and identify any notable differences between annual members and casual riders.

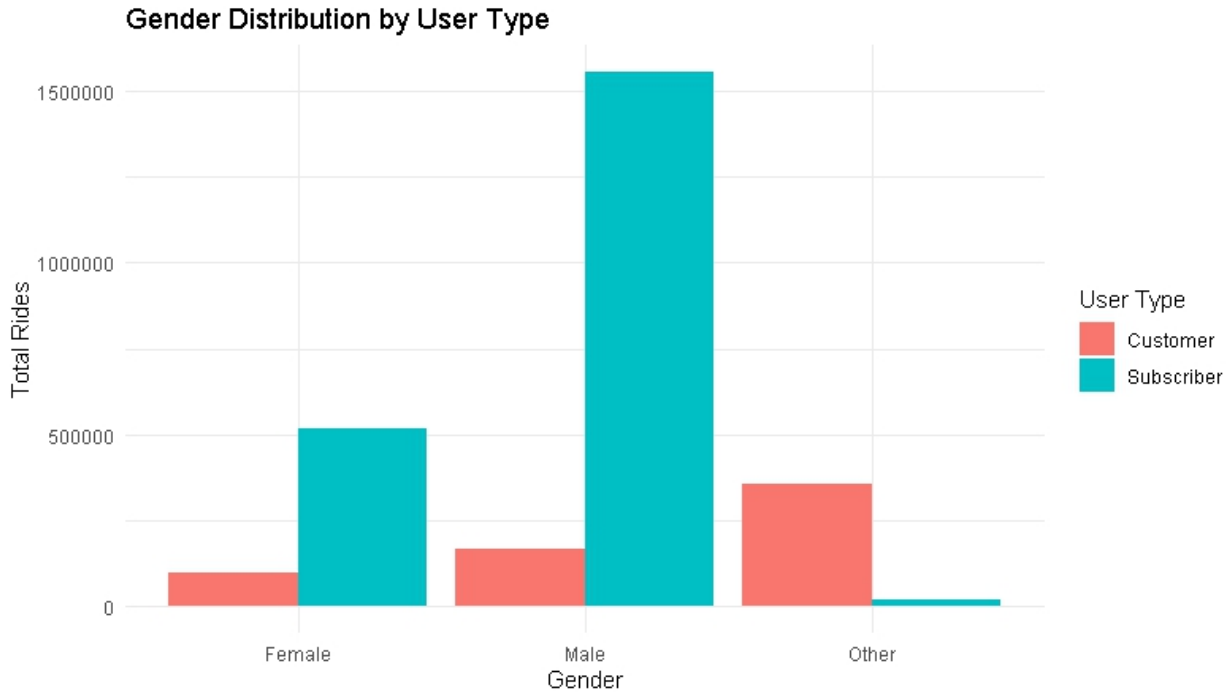
Findings:

Age Distribution: Annual Members: Tend to be slightly older, with a significant portion of users in the 25-45 age range, which aligns with working professionals. Casual Riders: Include a broader age range, with more young users (under 25) and older users (over 45).



The bike-sharing service appeals to a diverse age group, but the core user base for annual memberships is working-age adults.

Gender Distribution: Annual Members: A higher proportion of male users compared to female users. Casual Riders: Gender distribution is more balanced, with a nearly equal proportion of male and female users.



The service should consider targeted initiatives to balance gender participation among annual members.

This analysis highlights significant differences in how annual members and casual riders use the bike-sharing

service. By understanding these patterns, the company can tailor its services and marketing efforts to better meet the needs of both user groups.

Recommendations

Targeted Marketing for Casual Riders:

- **Leisure and Tourism Packages:** Develop special packages and promotions for casual riders who primarily use the service for leisure and sightseeing. These packages could include multi-day passes or discounts on extended rides.
- **Event Partnerships:** Partner with local events, festivals, and tourist attractions to offer bike-sharing as a convenient and cost-effective transportation option. This can attract more casual riders during specific events or seasons.
- **Seasonal Campaigns:** Launch seasonal marketing campaigns aimed at tourists and occasional users, highlighting the scenic routes and recreational areas accessible by bike.

Service Optimization During Peak Hours:

- **Increase Bike Availability:** Ensure a higher number of bikes are available at key stations during peak commuting hours (e.g., 8-9 AM and 5-6 PM) to meet the demand from annual members who primarily use the service for commuting.
- **Redistribution Strategies:** Implement dynamic bike redistribution strategies to balance the supply and demand across different stations. Use real-time data to move bikes from low-demand to high-demand areas efficiently.
- **Improve Docking Stations:** Enhance the capacity of docking stations at popular locations to accommodate the increased usage during peak hours. This can prevent overcrowding and ensure bikes are always available for users.

Expand Membership Benefits:

- **Loyalty Programs:** Introduce loyalty programs for annual members that reward frequent usage with benefits such as discounted renewal rates, free ride credits, or exclusive access to new features.
- **Corporate Membership Plans:** Offer corporate membership plans that allow companies to provide bike-sharing subscriptions to their employees as a perk. This can encourage more people to choose biking for their daily commute.
- **Enhanced App Features:** Develop app features that cater specifically to the needs of annual members, such as personalized ride recommendations, advanced trip planning tools, and integration with public transit schedules.

Data-Driven Decision Making:

- **Continuous Monitoring:** Continuously monitor usage patterns and customer feedback to identify trends and areas for improvement. Use data analytics to make informed decisions about service adjustments and expansions.
- **User Surveys:** Conduct regular surveys to gather insights from both annual members and casual riders about their preferences, pain points, and suggestions for improvement. Use this feedback to refine services and enhance user experience.

- **Predictive Analytics:** Utilize predictive analytics to forecast demand and optimize resource allocation. Predictive models can help anticipate peak usage times, potential maintenance needs, and other operational factors.

In conclusion, by implementing these recommendations, the bike-sharing service can better cater to the distinct needs of both annual members and casual riders. Tailored marketing efforts, improved service during peak hours, expanded membership benefits, and ongoing infrastructure enhancements will not only increase user satisfaction but also drive growth and sustainability for the bike-sharing program. Leveraging data-driven insights will ensure the service continues to evolve in response to user demands and market trends.