DBA4811 ANALYTICAL TOOLS FOR CONSULTING
Executive Summary

DBA4811 GROUP 7

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1. Objective

Ziro is seeking advice from our team of analysts on whether they should enter the Chicago bike-sharing market. Should they enter the market, Ziro would like recommendations on go-to-market strategies based on the market analysis and demand forecasting of bike usage on a daily basis.

The first part of this report focuses on the high level overview of the Chicago bike-sharing market. This would provide more confidence for Ziro to conduct a pilot test at the top 20 stations before launching a full-scale operational effort in Chicago. Such strategy helps in minimizing the risk associated with high investment in capital. Our analysts would also recommend the best time period to conduct the pilot test to ensure its effectiveness and show Ziro a glimpse of the predicted total number of daily bike-users in Chicago.

The second part of this report aims to provide Ziro with a focused analysis on these top 20 stations that our team recommends, and helps Ziro to predict the expected demand at one of these 20 stations per day given the associated weather condition.

2. Data Preprocessing

Cleaning

To understand the bike-sharing market in Chicago, we leveraged on existing data from one of the existing players, Divvy (2019). Additionally, we had also scrapped the hourly weather data of Chicago (Wunderground) to add another dimension of factors that would affect demand for bike sharing. Missing values were filled with the use of extrapolation and repopulation of existing data. Logically flawed data are dropped to ensure legitimate analysis results.

Feature Engineering

Several new features related to time were created from the merged dataset to give a more comprehensive analysis. Such as the extraction of day of week, hour of the day, categorisation of weekdays and weekends, holidays, seasons, generation and age.

3. Exploratory Data Analysis

To develop a sound understanding of the riders' consumer behavior, we segmented our analysis into 2 parts. Firstly, we conducted an overall analysis on their usage patterns, demographics and the popular locations they frequented. Next, we drilled deeper by analyzing the user behavior among the top 20 stations. A similar exploratory analysis was conducted where their usage patterns and demographics are analyzed.

Some key findings reveal that the majority of riders who tend to use bike renting services are millennial working adults who tend to live within the vicinity of their destination (i.e. office) or using it as their last mile transportation method. Furthermore, low demand during the weekends signifies that riders might perhaps prefer renting bikes for commuting more than leisure. Marketing efforts should hence

be more concentrated over the weekdays, especially Wednesday evenings. Our analysis also revealed that the summer season is the most popular period for bike rentals where total trips peak from July to September. Lastly, we identified the top 20 stations where Ziro could launch their pilot test with peak periods and target demographics detailed.

4. Evaluation of Models

Our team attempted different models to study the Chicago Bike-Sharing market. There are two parts to the modelling segment, namely modelling for the entire Chicago Bike-Sharing market, and modelling to focus on the top 20 stations we wish to explore as potential entrants. We will mainly center our findings to data from the top 20 stations while keeping the overarching trends to fine tune our analysis. Using negative binomial regression, we are able to ascertain that indeed, entering the market during the 3rd quarter of the year is the best timing as it contributes a lot in terms of its significance to the demand. Additionally, we provide Ziro with a glimpse of average demand for the next 7 days using the Triple Exponential Holts-Winter Forecasting method with R^2 value of 55.0%. Using sklearn models such as Random Forest, Support Vector, to Ensemble Models, we conclude that Voting Regressor is our best prediction model with R^2 value of 73.7%.

5. Recommendations

We categorised our recommendations into 3 different objectives:

- To increase operations efficiency, pilot bike renting service should be launched during the summer and targeted at working adults on weekdays to ensure a higher rate of adoption during launch
- To capture market share within Chicago, Ziro can attract potential users with competitive pricing during the right timings and leveraging on predicted demand to conduct cost efficient marketing strategies.
- To capitalise on under-addressed market potential with the aim to attract females, students and the older generation through collaborations with the local authorities and campuses.

6. Conclusion

To conclude, with the goal of hitting break-even within the shortest timeframe and maximizing profits while achieving cost reduction, Ziro's strategies will be guided with the exploratory insights and predictive models to optimize key performances. From the understanding of current market situation, future demand prediction, optimal bike allocation to marketing efforts, Ziro will successfully establish itself in this new expansion.