

Analyzing Data to Improve User Retention & Growth

<https://github.com/bhagirathbhard/BA888-TeamJockMKT>

The logo for Questrom School of Business, featuring the text "QUESTROM SCHOOL OF BUSINESS" in white, stacked vertically within a red square.

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BU MSBA Capstone Project: Jock MKT
Midterm Summary Status Report: July 2023
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Abstract

This project focuses on enhancing user engagement and improving retention rates on the Jock MKT sports trading platform. Leveraging data analysis, statistical modeling, and proposing targeted bonus tests, our study aims to identify effective strategies to optimize the user experience and drive long-term growth for JockMKT. Through a comprehensive analysis of user behavior, drop-off patterns, and past bonus offer tests, we propose a cash-back incentive test to re-engage paid inactive users. Additionally, we explore the potential development of a predictive model to forecast user drop-off probability. The findings and recommendations presented in this paper provide valuable insights for Jock MKT to enhance user retention, improve post-bonus lifetime value (LTV), and secure its position as a leading platform in the sports trading industry.

Problem Statement

Jock MKT seeks to enhance user engagement and retention, combating a decline in paid active users during key sports seasons. The challenge is to identify effective strategies, leveraging data analysis and predictive modeling, to optimize user experience and drive long-term growth. Addressing this problem requires an in-depth analysis of user behavior, drop-off patterns, and targeted measures to improve post-bonus LTV, user engagement, and retention. A successful resolution will secure Jock MKT's position as a leading sports trading platform, catering to user needs and ensuring sustained success.

Project Expected Timeline

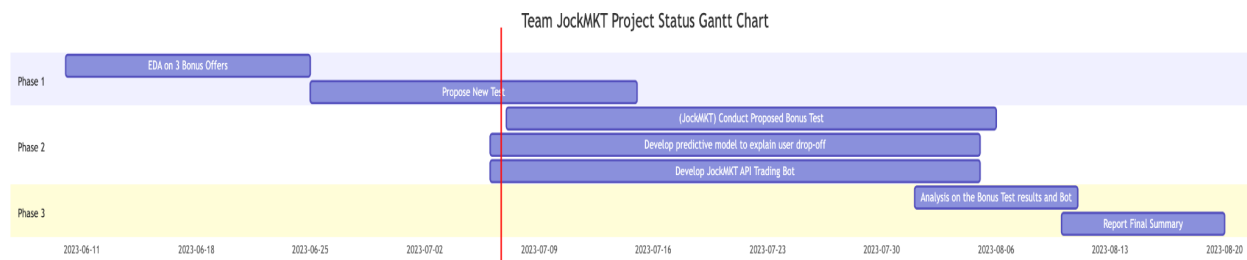


Figure 1: Team JockMKT Project Status Gantt Chart

Background Research

Our research involved a thorough exploration of various betting apps and scholarly papers to understand sports betting better. Here are the key findings:

1. DFS vs. FS Players: Daily Fantasy Sports (DFS) players are more likely to engage in other forms of gambling, such as poker, lottery, scratch-offs, and casinos, compared to Regular Fantasy Sports (FS) players. (Nower et al., 2018)
2. Entry Fee Comparison: FS players often participate in fee-free games, while DFS players face higher entry fees due to the availability of daily sports betting companies. (Lopez et al., 2017)

3. Profitability of Player Groups: Players categorized as "Big Fish," despite experiencing significant losses, generate substantial revenue for fantasy sports companies. (Miller et al., 2018)
4. Marketing Strategies of Fantasy Sports Companies: Companies strategically time their ad campaigns and promotions, especially before major sporting events, to increase user engagement and participation. (Lopez et al., 2017)

These findings provided valuable insights into user behavior, profitability of player segments, and effective marketing approaches in fantasy sports. As such, our research aims to propose strategies that enhance user engagement and improve retention on Jock MKT's platform.

Scope

This research paper focuses on a specific scope within the context of Jock MKT. The scope encompasses the analysis of app usage information, correlation of drop-off periods with game seasons or peak events, development of a predictive model for user drop-off probability, proposal and analysis of a new test to incentivize re-engagement and increase retention for paid inactive users, and recommendations for optimizing key metrics such as post-bonus LTV, user engagement, and retention on the Jock MKT platform.

While the paper delves into previous bonus offer tests and statistical analysis, the primary focus is on providing insights and strategies to enhance the user experience and drive higher user retention rates. The scope is limited to the specific objectives and findings within the realm of Jock MKT and its user base.

Overview of the Approach Followed:

The research methodology was structured and comprehensive, encompassing the following key steps:

- **Data Collection:** A meticulous data collection process was employed, encompassing app usage information from Jock MKT's platform, historical data from past bonus offer tests, and relevant Amplitude datasets for user session tracking and analysis.
- **Analysis of Past Tests:** Rigorous statistical analysis techniques were applied to compare crucial metrics between control and test groups in previous bonus offer tests. This analysis focused on total deposit amounts and lifetime value (LTV) to evaluate the effectiveness of these tests in driving user retention.
- **Development of a New Test:** A novel test was devised to incentivize re-engagement and boost retention among paid inactive users. The test incorporated a carefully crafted cash-back offer, targeting specific user segments, and leveraging effective communication channels. The duration of the test was established to observe user behavior and measure the impact of the intervention.

- **Future Possibilities:**

- Predictive Model: Exploring the potential development of a sophisticated predictive model capable of forecasting user drop-off probability. This model could contribute to proactive retention strategies.

By adopting this robust approach, the research aims to deliver insightful findings and strategic recommendations that enhance user engagement, retention, and the overall user experience on the Jock MKT platform.

Initial Data Analysis

During the initial data analysis phase, we examined the datasets from three previous bonus offer tests conducted on the Jock MKT platform: the *Churn Risk Bonus Bet*, *Signup 7 Day Free Slip* (***See Figure 2 Below***), and *Re-deposit* (***See Figure 3 Below***) tests. These tests aimed to enhance user engagement and retention.

A notable finding emerged from our analysis: a distinct drop-off point in the number of paid active users following major events like the NBA Finals and playoffs. (***See Figure 4 Below***) This drop-off indicated the need to address the issue and develop strategies to prevent users from becoming paid inactive.

The *Churn Risk Bonus Bet* test targeted users who had been inactive for 14 days, offering a \$20 bonus risk-free bet via email and push notification. The *Signup 7-Day Free Slip* test provided non-paid users with a \$10 bonus slip on the 7th day after signing up. The *Re-deposit* paid 28-59 Test offered two deposit match options: a 100% match up to \$20 and a 50% match up to \$100.

Statistical analysis showed no significant differences in deposit amounts between the control and test groups in these tests. This implies that the current cohort separation did not have a substantial impact on the desired outcomes.

In addition to analyzing the datasets from past tests, we conducted a thorough analysis of the amplitude data provided by Jock MKT. Amplitude is a digital analytics platform that enables companies to track user journeys and behavior on their platforms. With access to this data, we gained valuable insights into the behavior of Jock MKT's users. **Our analysis focused on important metrics such as the average time spent on the app, the number of sessions users had on the platform, the peak day of user activity, and instances of user inactivity.** We also calculated the median time spent per day and the 7-day rolling average to gain a deeper understanding of user engagement patterns. This analysis has significantly contributed to our understanding of the user experience on Jock MKT and has provided us with valuable information to enhance user re-engagement and retention strategies. (***See figure 5 & 6 Below***) As we continue our research, we look forward to exploring additional amplitude data to further

refine our analysis and gain a comprehensive understanding of how to improve user re-engagement and retention rates. Furthermore, we plan to utilize this data to develop a predictive model that can accurately forecast a user's drop-off probability, enabling proactive retention strategies.

Proposed Test & Expected Findings

To address the drop-off of paid active users and enhance user retention on the Jock MKT platform, **we proposed a targeted bonus test aimed at re-engaging this specific paid inactive user segment.** The hypothesis behind this test is that by offering a cash-back incentive to paid inactive users, we can motivate them to re-engage with the platform and increase their likelihood of remaining active users.

The test will target approximately 800 paid inactive users who have not placed bets in the last 30 days. These users will be selected based on their previous activity and inactivity patterns. The offer will consist of a cash-back reward equivalent to 50% of the user's slip, with a maximum cap of \$10. This cash-back reward will be immediately credited to the user's account upon placing a bet.

To ensure maximum visibility and reach, the implementation of the test will involve multiple channels, including email notifications, mobile push notifications, and web platform banners. **(See Figure 7 Below)** These communication channels will effectively deliver the cash-back offer to the targeted users, enticing them to re-engage with Jock MKT.

The test will be conducted from early July to August 2023, running for 30 days. This time frame allows for sufficient observation of user behavior and enables us to assess the impact of the cash-back offer on re-engagement and user retention over a meaningful period.

During the test period, we will collect and analyze various data points to evaluate the effectiveness of the cash-back offer. Key metrics to be tracked include the user journey, slip value, cash-back redemption rate, retention rate, and Amplitude UI Metric Reporting. These metrics will provide valuable insights into user behavior and engagement levels, allowing us to assess the impact of the test on driving re-engagement and increasing user retention.

To validate the impact and statistical significance of the test, we will perform a thorough analysis, including t-tests on relevant metrics. This statistical analysis will provide robust evidence regarding the effectiveness of the cash-back offer in driving user re-engagement and improving overall user retention on the Jock MKT platform.

Based on our expectations, we anticipate that the cash-back offer will serve as a compelling incentive for paid inactive users to re-engage with the platform. By addressing their

disengagement and providing immediate rewards, we expect to observe a significant increase in user reactivation and retention rates. The data analysis will provide comprehensive insights into the success of the test, enabling us to determine the impact of the cash-back offer on user behavior and retention, ultimately informing future strategies to enhance user engagement and retention on Jock MKT.

Future Scope

Moving forward, this research opens up several potential avenues for further exploration and development. Firstly, as recommended by JockMKT to focus on, there is a scope for developing an API trading bot using the provided API keys from Jock MKT. This trading bot can leverage real-time data and market trends to optimize trading performance.

Secondly, there is further room for deeper analysis of Amplitude data, including exploring additional dimensions of user behavior and preferences to inform targeted strategies for user re-engagement and retention.

Third and finally, the test results of the proposed cash-back offer should be analyzed to evaluate its impact on user behavior and engagement. This analysis will provide valuable insights for future iterations and enhancements.

Potential Risks & Limitations

It is important to consider potential risks and limitations in this research. The proposed test outcomes may vary due to various user-influencing factors. The generalizability of the analysis of past tests may be limited. The Amplitude data analysis provides insights into available metrics. The predictive model relies on historical data and assumptions. External factors, like market changes, can impact user engagement. Future directions, such as developing an API trading bot, involve technical complexities and require ongoing monitoring. These risks and limitations will be managed throughout the research process.

Code Repository & Tools Used

The data for this research project was downloaded from the Redshift database and provided to us by the Jock MKT team. The analysis and modeling tasks were performed using Python in Google Colab, a cloud-based Jupyter Notebook environment. The code and project files were managed and version-controlled using a GitHub repository. This collaborative approach enabled effective data analysis and ensured seamless collaboration with the Jock MKT team throughout the research process. [GitHub Link](#). Please note the code and the .csv file are currently not uploaded on the public repository, pending approval from JockMKT to be able to share it on the public domain.

Appendix

Figures

Note: Axis and numbers may be redacted due to NDA restrictions.

Figure 2: Jock MKT's Sign-Up Test Implementation Banner

This figure displays the implementation banner used during the Sign Up Test on the Jock MKT platform. The banner aims to incentivize new users by offering a \$10 bonus slip on the 7th day after signing up. The strategic placement and design of the banner are key factors in driving user engagement and retention.



Figure 3: Jock MKT's Redeposit Up Test Implementation Banner

Jock MKT platform. The banner is designed to encourage users to make a redeposit by offering two deposit match options.



Figure 4: Total Time Spent on Platform - Analysis of Previous Test Data

This figure shows the total time spent on the Jock MKT platform, revealing a significant drop-off in engagement among paid active users after the NBA playoffs. Understanding these patterns helps identify opportunities to improve user retention and enhance the overall user experience.

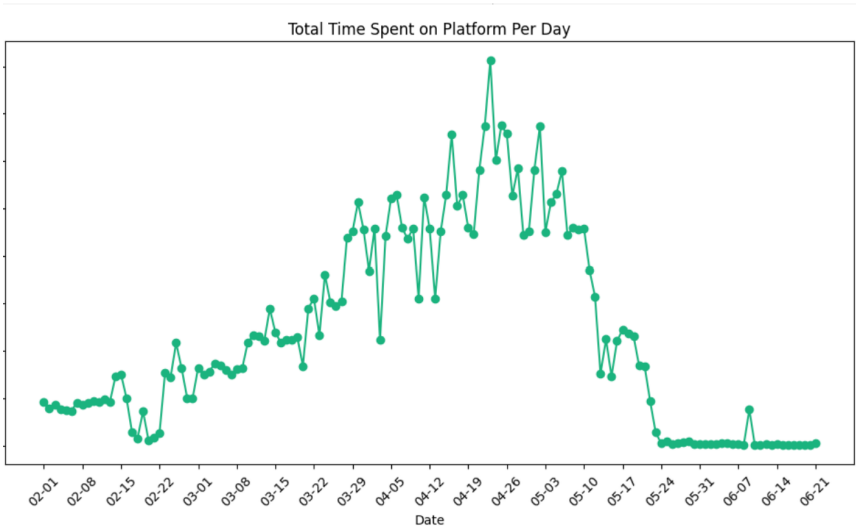


Figure 5: Median Time Spent per Day for Paid Inactive Users

This figure displays the median time spent per day by paid inactive users, as derived from the Amplitude data analysis. It provides insights into the average engagement level of this user segment. Understanding the median time spent per day can help identify opportunities to improve user re-engagement strategies and enhance the overall user experience on the Jock MKT platform.

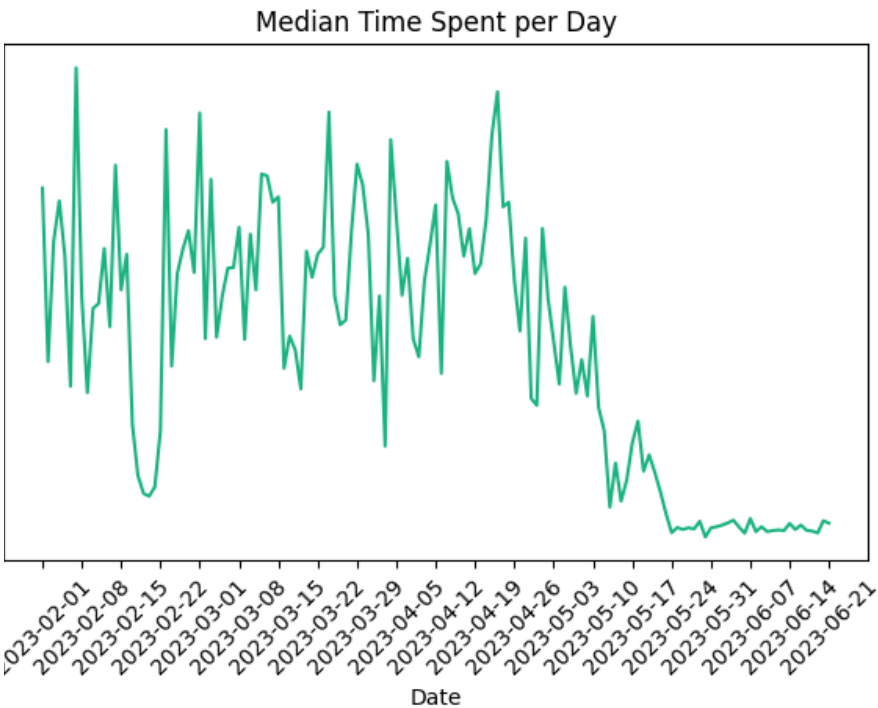


Figure 6: Average Time Spent per Day for Paid Inactive Users

This figure showcases the average time spent per day by paid inactive users, as obtained from the Amplitude data analysis. It provides valuable insights into the typical engagement patterns of this user segment. Understanding the average time spent per day can assist in identifying areas for enhancing user re-engagement strategies and improving the overall user experience on the Jock MKT platform.

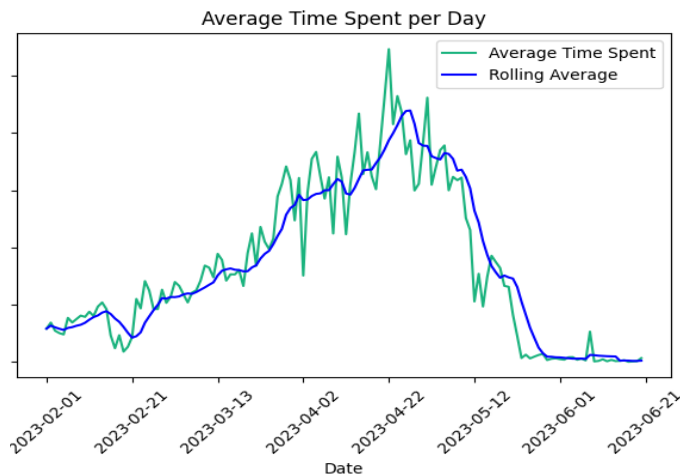


Figure 7: Suggested Banner for Proposed Test - 50% Cash-Back Offer

Note: This banner is a suggestion for the proposed test and is for illustrative purposes only.

This figure presents a suggested banner design for the proposed test, which offers a 50% cash-back incentive to paid inactive users. The banner aims to attract the attention of the target audience and communicate a compelling offer, encouraging users to re-engage with the Jock MKT platform. The visual design and messaging of the banner play a crucial role in effectively conveying the value proposition of the cash-back offer and driving user reactivation.



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