How can we increase revenue from Catch the Pink Flamingo?

RAMANA SONTI

Catch the Pink Flamingo from Eglence Inc. is a simulated video game with users from different devices can play at different levels on the network.

The game essentially involves users clicking on pink flamingos that pop up in a grid overlayed in a geographic area on the map.

Each level of the game is associated with a different degree of difficulty to keep the users interested.

While playing the game, the users have the opportunity to make in-app purchases to boost/aid their ability to play the game.

In addition, the users can choose to click on the ads that get displayed from time to time.

The users also interact with other users via chat sessions.

The goal of this project is to analyze the data collecetd during the game and create insights into new revenue opportunities.

Problem Statement

How can we use the following data sets to understand options for increasing revenue from game players?

buy-clicks.csv - a line is added to this data set when a player makes an in-app purchase

ad-clicks.csv - a line is added when a player clicks on an ad

user-session.csv - start and stop times for user session are recorded in this file. The session ends for all users in the team when the team goes to the next level

game-clicks.csv - a line is added to this file each time a user performs a click in the game

users.csv - a line for each user playing the game

team.csv - line for each team terminated in the game

team-assignments.csv - a line is added to this data set each time a user joins a team

Eglence currently has two sources of revenue. One is from the users making in-app purghases and the other is from the ad sponsors.

The revenue from the users who did the in-app purchases is recorded for each user session in buy-clicks.csv data set.
With start and stop times available for each user session (user-session.csv), it would be possible to figure out how long each user played the game and how well each user (from isHit from game-clicks) played. Does the user's ability to play better has any effect on the buying or ad viewing habits?

The answers to questions like what type of users buy more (or less)i can be obtained if we could analyze the data using the techinues taught in data science.

Data Exploration Overview

During data exploration it is possible to quickly find some relations and patterns in the data by doing some aggregations, filtering, and some plots.

Some of the most important things that were discovered during this phase are:

. All top spenders are iphone users

. Top three players are iphone users

. Most of the revenue was from item 5 which was most expensive

Aggregation:
1. Total amount spent buying items is 21407.0
2. Number of unique items available to be purchased is 6
3. Most of the money was made by item 5 ($12200) which is also the most expensive of all.
4. Item 2 was the top seller in terms of quantity followed by item 5.
5. Item 0 was least expensive.
6. Item 1 made the least amount of money and sold the least in terms of quantity

Filtering:
1. All top spenders use iphone as a platform
2. Top three spenders spent over $200 each
3. The best hit ratio from any player (happens to be the one with userId 471) is 14.5%

The following table shows the user id, platform, and hit-ratio percentage for the top three buying users:

Rank	User Id	Platform	Hit-Ratio (%)
1	471	iphone	14.50
2	12	iphone	13.07
3	2229	iphone	11.60

What have we learned from classification?

. As shown in Appendix (page 12), the overall accuracy of the model is 88.496%

. Out of 565 entries in the test set, the model predicted 500 of them correctly and 65 them in correctly.

. 308 - Number of users correctly predicted by the model as PennyPinchers

. 192 - Number of users corrctly predicted by the model as HighRollers

. 38 - Number of HighRollers incorrectly predicted by the model as PennyPinchers (False Positives)

. 27 - Number of PennyPinchers incorrectly predicted by the model as HighRollers (False Negatives)

As shown in the decision tree in Appendix (page 13), the model predicts that 83% of the users that play from platformType iphone are HighRollers and they are 39.7% of the total test dataset. The rest of the users that use other platformTypes are mostly PennyPinchers.

Recommendations from Classification
1. Target iphone users more with the ad campaigns as they tend to spend more.
2. Introduce more in-app purchases.

What have we learned from clustering?

Training Dataset:

. single column vector of three elements money_spent, total_adclicks, and gameclicks_per_hour.

Cluster Count:

.tested the training dataset from 2 to 20 clusters and plotted the cluster_count against WSSSE as shown by the elbow curve below (page 17).

.selected 6 as the value for number of clusters because the decrease in WSSSE is much more gradual with increasing number of clusters beyond 6.

There are two prominent clusters with about 1/3 of the user population in each group. The game clicks and ad clicks for the first group is relatively fewer compared to other groups. Eglence should consider providing incentives to click on ads.
The second group clicked on more number of ads per person. Eglence should consider charging more from the ad sponsors.

From our chat graph analysis, what further exploration should we undertake?

We have analyzed the chat data to find the most chattiest users and teams and the most active users based on clustering coefficients.
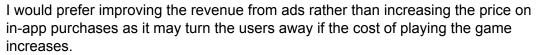
It would be interesting to investigate the clicking behavior (ads/in-app/game) of the most (or the least) active users from chat groups.

The way we could identify the longest conversation chain, cliques, and clusters using graph analytics is remarkable as it would be much easier and cheaper to target/inject into only a couple of nodes in these groups as the information gets propagated to pretty much everyone in the group.

Recommendation

Eglence should focus more on encouraging the users to click on ads to generate more revenue from ad sponsors. To that end, it could consider

. incentivising ad-clicking

. changing ad strategy to attract more users

. charging ad sponsors more

I would prefer improving the revenue from ads rather than increasing the price on in-app purchases as it may turn the users away if the cost of playing the game increases.
At the same time, Eglence should consider increasing the ad prices and come up novel ideas to attact more users to click on ads.

The following are the recommendations made throughout the analysis:
1. Target iphone users more with the ad campaigns as they tend to spend more.
2. Introduce more in-app purchases.
3. Consider charging more from the ad sponsors
4. Provide incentives to users to encourage them to click on more ads