How can we increase revenue from
Catch the Pink Flamingo?

To Phung Huy

Problem Statement

How to use the following data sets to explore revenue increasing strategies?

Useful Datasets	Their roles
Buy-clicks.csv (1)	**Main dataset** - 1st level revenue info
Ad-clicks.csv (2)	Can be combined with (1) for insights on **conversions**
User-session.csv	Users' **in-game** behaviors
Game-clicks.csv	Users' **in-game** behaviors
Chat-data package	Contains inter-user interactions info. Important for **PR-related** analytics

The first two datasets (1) , (2) are important datasets to derive revenue related information. Dataset 2 can be combined with dataset 1 to derive various ad conversion rate.

To increase revenue one can either increase customers' total spendings or ad conversion rates. This is because, for in-app purchases ads: higher conversion rates equals higher profit, while for third party ads, higher conversion rates provide better leverage to charge the advertisers more

We can use the next two datasets to find relationships between a user's in-game behaviors and their spendings or conversion rate. Such strategy, of combining multiple datasets to draw insights, is at the heart of data science.

The insights obtained can allow us to increase revenue by tailoring different sales/marketing strategies to different groups of users based on in-game behaviors
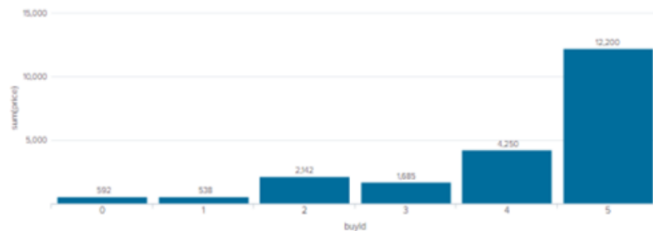
Last but not least, exploration of the chat data can allow us to design better PR or more effective marketing strategy. This can have an indirect effect on increasing revenue

Data Exploration Overview

Histogram showing buy count for each item
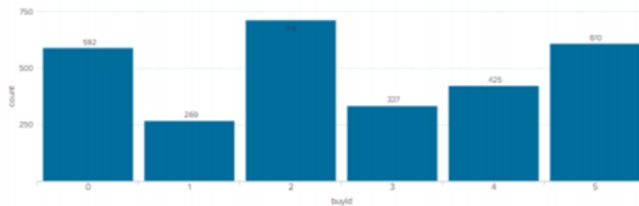
A histogram showing how much money was made from each item:

- Item 5 = **current** money spinner

- Item 4 = **potential** money spinner → focus

- Top payers all I-phone users?

Rank	User Id	Platform
1	2229	iPhone
2	12	iPhone
3	471	iPhone

Brief explorations of revenue data show us that Item 5 is our most effective money making machine.
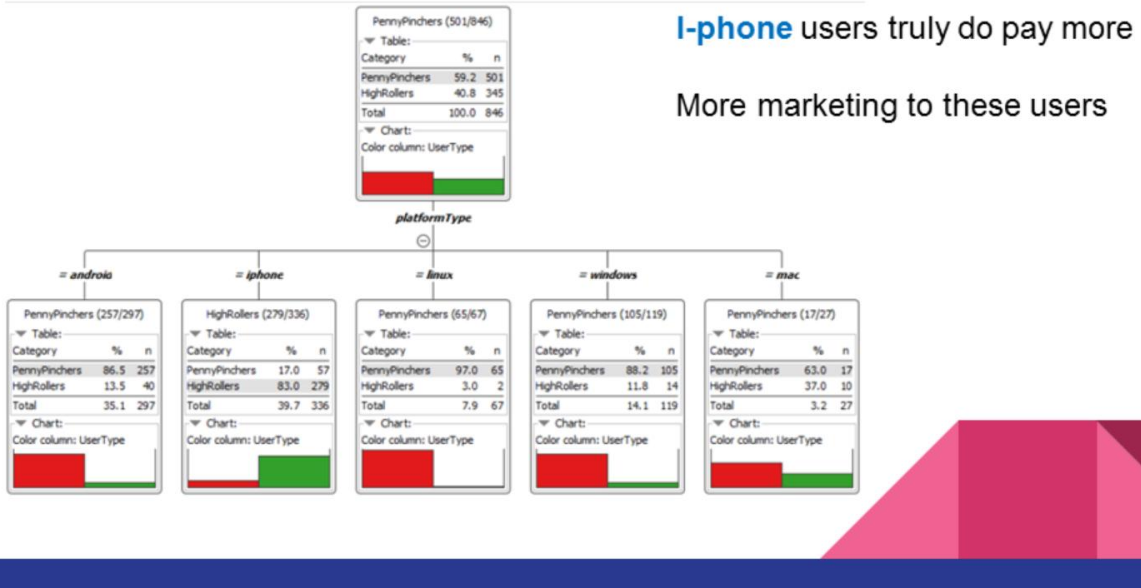If it is an in-game item, we should maintain current marketing strategy.
If it is an item from third party app, however, then it's time to charge higher advertising fee or raise the commission rates

Item 4 can also be another potential money spinner for us, provided that we implement some strategies NOW to boost sales of this item.

Details about top 3 spenders hints at I-phone users being more generous spenders. True or not? This needs more explanation

The classification result shows that I-phone users are High Rollers who spend on average more than 5 dollars per purchase

Other platforms' users are Penny Pinchers who spend on average 5 dollar of less per purchase

This prediction model predicts the correct spender class of user 88.5% of the time

To increase revenue, we should target third-party ads of more expensive items (to get higher commissions) or more epensive in-game items to I-phone users
We can also send them vouchers & tailored thank you emails to encourage them to maintain this behavior

On the other hand, we can introduce more promotions to other platforms' users

What have we learned from clustering?

Cluster #	Center (purchase_per_adclick, avg_session_length, hit_rate)
1	[-0.21903156, 0.43540912, -0.0538909]
2	[-0.32941065, -1.7305019 , -0.42341042]
3	[-0.46824539, -2.23297675, 4.92736511]
4	[2.3048937 , 0.09565116, 0.41877504]

We can segment our players into 4 groups

- C1 – **game lovers** – longest play time
- C2 – **least skillful** – worst hit rate
- C3 – **assassins** – extremely skillful, efficient & frugal
- C4 – **willing spenders** – our target demographic

To increase revenue we should tailor specific sales/marketing strategy to each group (cluster) of users

Game lovers spend the most time playing → they should be seeing more ads compared to others → target more ads to them

Least skillful heave the lowest hit rate among the group → We should target ads about hit-rate-promoting in-app items to them

Assassins spend the least & play the game using shortest session length → we should present only ads about promotional packages or combo purchases

Last group are willing spenders. These are our target milk cow group. We should target more ads of more expensive products to these users
If we target third party ads to these users, we should charge the advertisers more or take higher commissions

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

We have identified chattiest users & teams (only top 3 shown here)

Users	Number of Chats
394	115
2067	111
1087 ties with 209	109

Teams	Number of Chats
82	1324
185	1036
112	957

We have also identified most active user clusters

Further possible actions

- Determine sentiment with NLP
- Determine least/never purchased items & chattiest user

in each cluster

We have already identified chattiest users and teams (there are 10 each category but I only presented top 3 here)

We have also identified the top dense communities (group of users who frequently interact with one another) in the graph

We can perform further exploration such as

1) Using NLP analytics on the chat text to see what most chattiest people think about the game. Are they happy/frustrated? Are there aspects they want improvements in? These people are most likely to voice their opinions out to other people so it is important to track what they are saying. If we don't do this bad sentiment about the game can spread → users can leave → revenue drops

2) For each dense communities, we can perform more analytics of what items have never been/are rarely bought and either
- Find the chattiest user & market only to him/her and hope the marketing can spread by word of mouth to his/her friends in the cluster → save ad cost but still effective
- Market to users in same cluster with ads starting with "Your friends x, y also buy … ". The friends x,y come from same cluster

Recommendation

More than one recommendations for Egglence to increase revenue!

1. Focus on item id 4 – potential money spinner

2. Targeted luxury item marketing to I-phone users. Also charge 3rd party advertiser more to target this demographic

3. Specialized marketing strategies to different user groups arising from suggested 4-group clustering

4. PR-analytics of game sentiment via chats from chattiest users

5. Innovative marketing from knowledge of dense user communities

This slide will summarize all the recommendations I have so far on how the company can increase its revenue

There are 5 recommeded actions to increase revenue

Please refer to slide for all 5 recommendations