

GAME INSIGHTS PROJECT

1) Introduction

Case Study: An analysis on the gameplay data of a prototype by XXXX.

The purpose of this study is to gain insights into the prototype in use between 3 November 2017 and 20 March 2018, and give business suggestions based on these results.

Available data sets:

- Install
- Login
- Tutorial Funnel
- Endgame
- Ad Request
- IAP Revenue
- Cost
- Ad Revenue

Metrics Calculated:

- Daily Active Users
- Installs (Organic vs Paid)
- Retention
- CPI & eCPI
- Average Game Duration
- Average Session Duration
- Games per Session
- Tutorial Funnel
- Total Revenue
- Return on Investment
- Average Daily Revenue
- Average Revenue per Paying User
- Average Revenue per Daily Active Users
- Average User Life Time
- Life Time Value
- Average Transaction Value
- Time to Purchase
- Cost and Revenue Distribution

This report will only reflect the results of these calculations. Calculation outputs are provided as an attachment (Attachment 1 – Outputs) to this file.

Platforms used: PostgreSQL, RStudio, MS Excel

SQL queries are provided in the .sql file attached:

“Attachment 2 – OnurKorkmaz.sql”

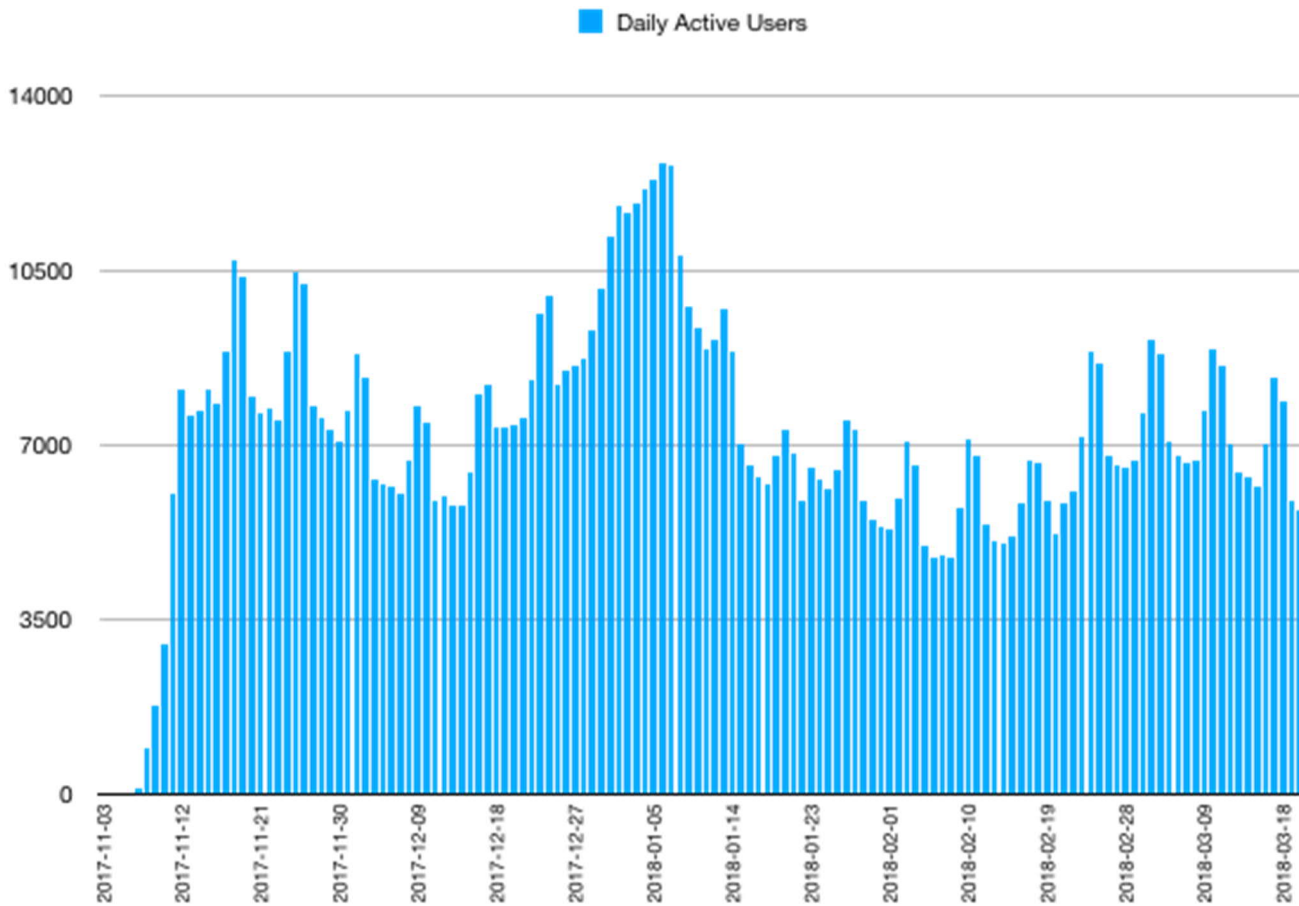
R script is provided in the .R file attached:

“Attachment 3 – OnurKorkmaz.R”

2) Metrics

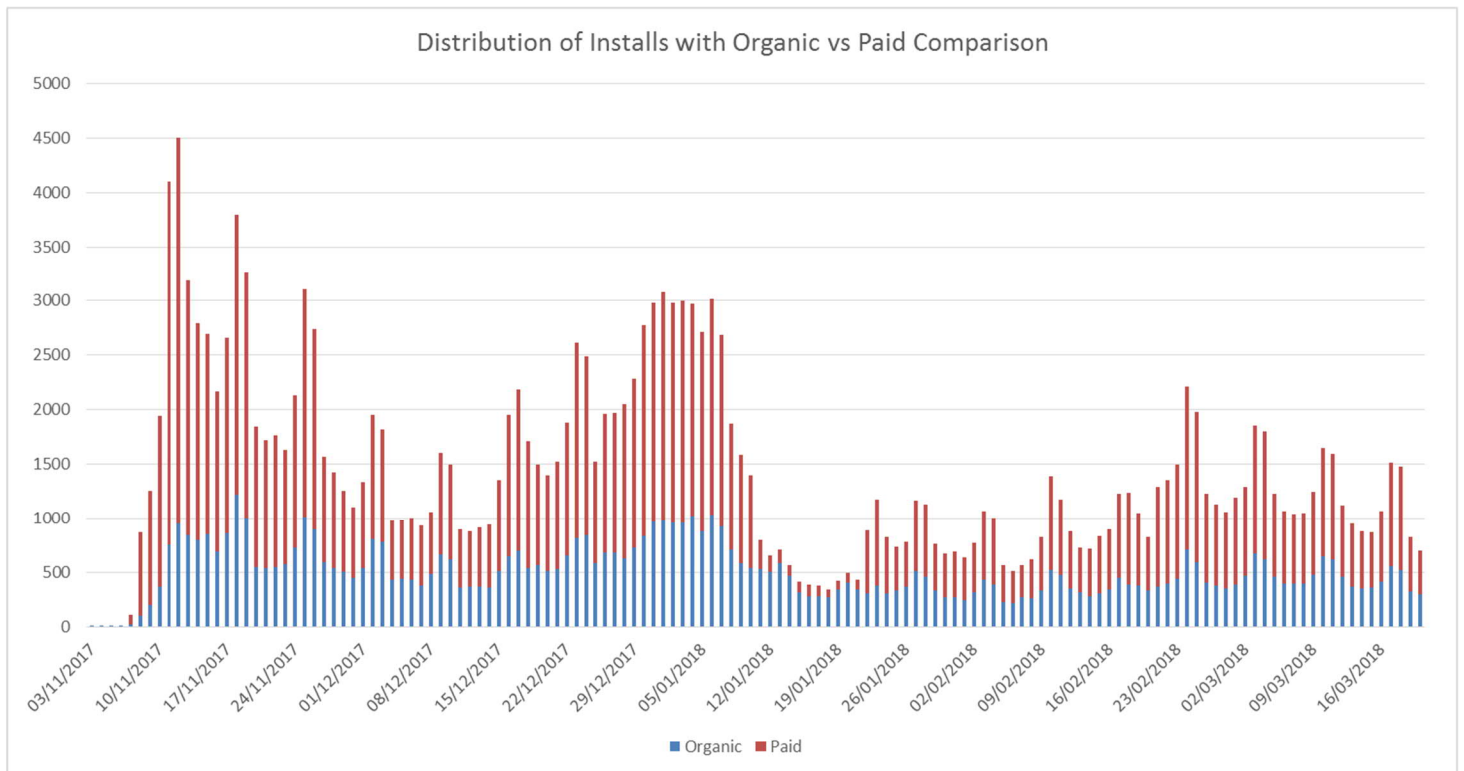
Daily Active Users (DAU): Number of individual users who played the game on a given day. This metric can be seen as a measure of player engagement.

Distribution of Daily Active Users along the life time of the prototype can be seen below:

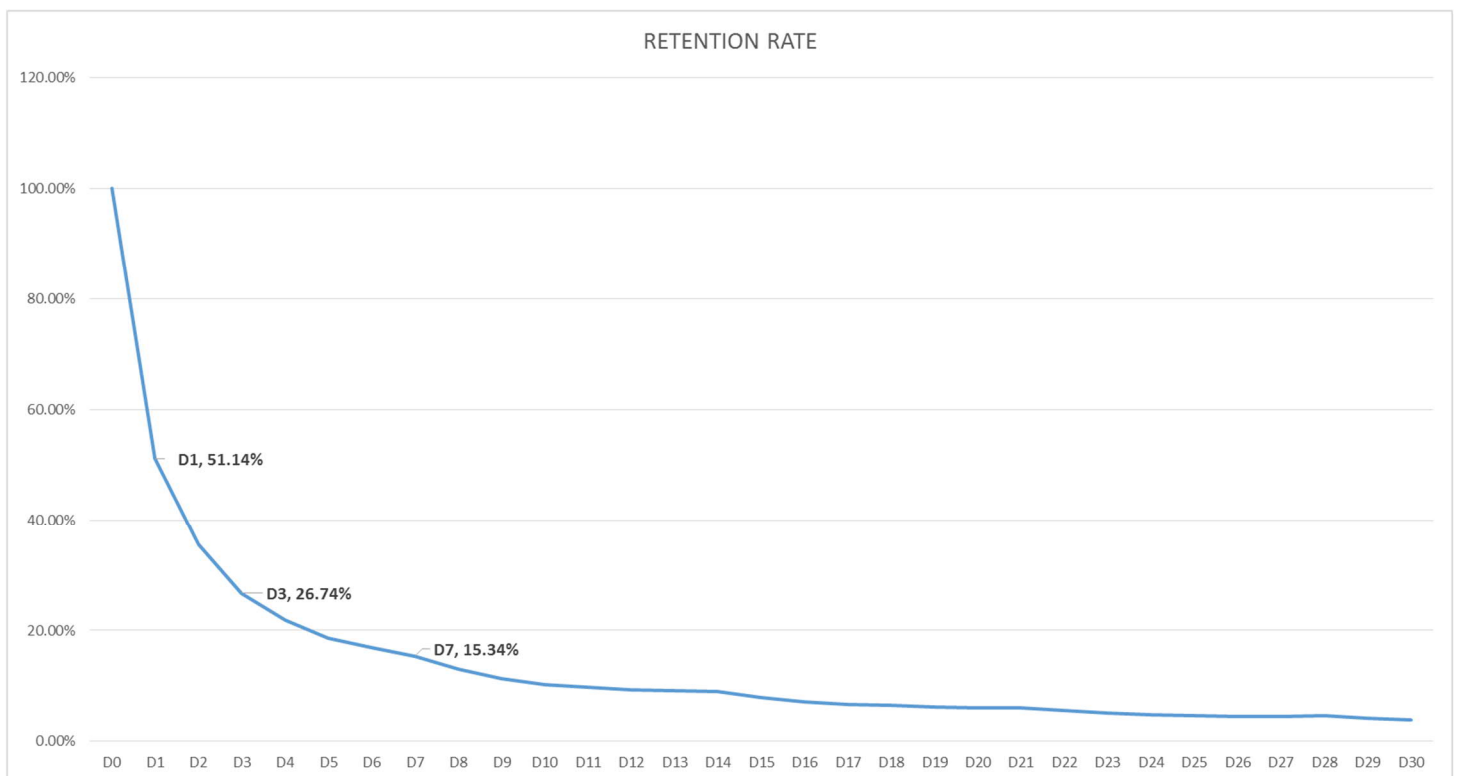


Average Daily Active Users (ADAU): Average number of individual users who played the game over the course of the prototype's lifetime. Calculated ADAU for the prototype is 7,167.

Installs: Total number of installs is 197,875 out of which 69,938 (35.3%) are organic and 127,937 (64.6%) are paid. Distribution of Installs along the life time of the prototype can be seen below:



Retention: Average Retention Rate distributed over day counts is as following:



CPI (Cost per Install): CPI is calculated as:

$$\frac{[\text{total cost to acquire new users}]}{[\text{total paid (distinct) users acquired}]} =$$
$$\$87,867.07 / 125,050 = 0.704 \text{ \$/user}$$

eCPI (effective Cost per Install): eCPI is calculated using the same formula, but this time including the organic users as well and the result is: $\$87,867.07 / 193,285 = 0.455 \text{ \$/user}$

Average Game Duration: Average Game Duration is calculated as 94 seconds.

Average Session Duration: Average Session Duration is calculated as 9.7 minutes.

Games per Session: Number of Games per Session is calculated as 2.36

Tutorial Funnel: 91.38% of the users who installed the game completed all 8 steps of the Tutorials. 4.93% of the users never played the Tutorials.

Total Revenue: Total Revenue is calculated as:

$$[\text{Total IAP Revenue}] + [\text{Total Ad Revenue}] = \$8,581 + \$78,392 = \$86,973$$

Return on Investment: ROI is calculated as:

$$([\text{Total Revenue}] - [\text{Total Cost}]) / [\text{Total Cost}] = -1.01\%$$

Please note that ROI calculation does not take indirect costs (staff salaries, office maintenance & running, interest, taxes, asset depreciation etc.) into account.

Average Daily Revenue: ADR is calculated as:

$$[\text{Total Revenue}] / [\text{Total \# of Days}] = \$86,973 / 138 = 630.24 \text{ \$/day}$$

Average Revenue per Paying User: ARPPU is calculated is:

$$[\text{Total IAP Revenue}] / [\text{\# of unique Paying Users}] = \$8,581 / 1600 \text{ users} = 5.36 \text{ \$/user}$$

Average Revenue per Daily Active Users: ARPDAU is calculated as:

$$\text{ADR} / \text{aDAU} = (630.24 \text{ \$/day}) / (7,167 \text{ users/day}) = 0.088 \text{ \$/user/day}$$

Average User Life Time: Average user life time is calculated as 18.38 days

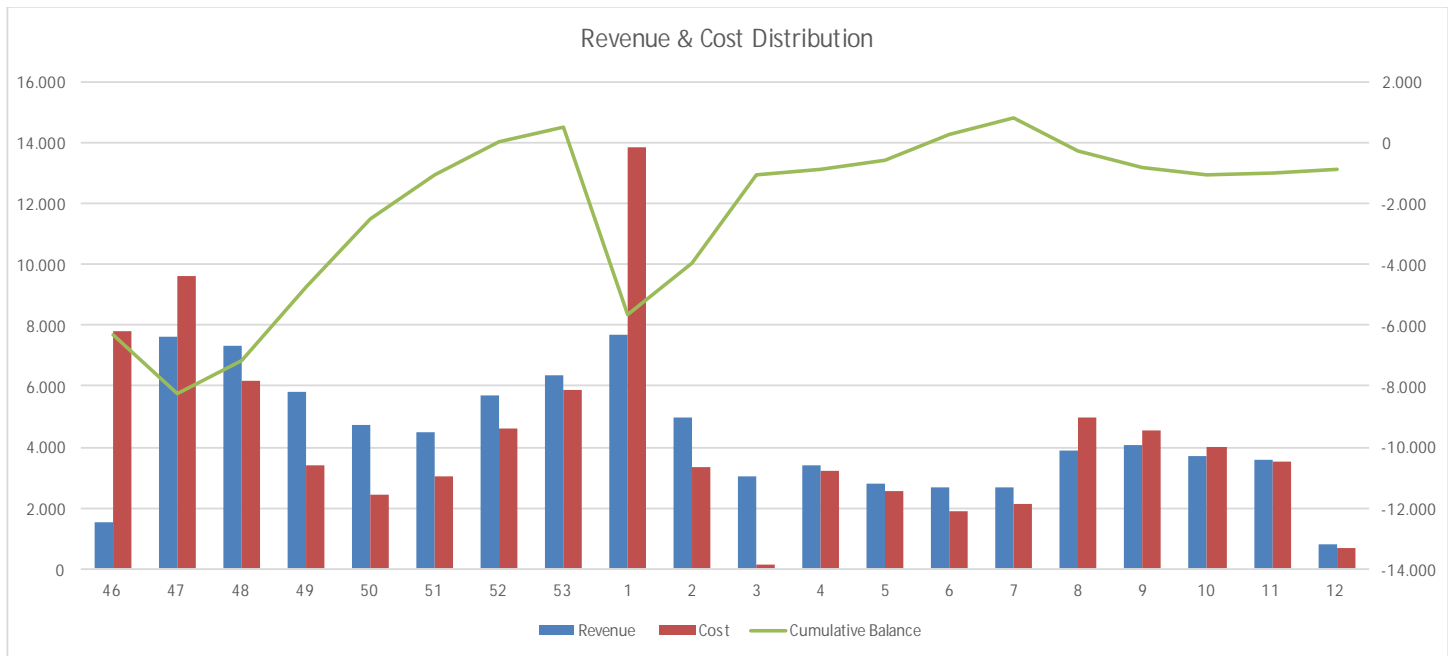
Life Time Value: LTV of the prototype is calculated as:

$$[\text{ARPDAU}] \times [\text{Avg User Life Time}] = 0.088 \text{ \$/user/day} \times 18.38 \text{ days/user} = \$1.62$$

Average Transaction Value: ATV is the average amount earned by in app purchases and calculated as \$2.40

Time to Purchase: "Time to Purchase" is the average time between users' first in-app purchase and their first login and it is calculated as 6.5 days.

Revenue & Cost Distribution: Revenue & Cost Distribution analysis is made by using the IAP Revenue, Ad Revenue and Cost data. Other possible indirect costs such as staff salaries during the development and the running phases, office maintenance & running, taxes, interest, asset depreciation etc. are excluded for the sake of simplicity. Calculations can be found in the Output file named "Revenue and Cost Distribution.xlsx"



Cumulative Balance is shown on the secondary axis. In order to have a better idea of the game's financial performance, aforementioned indirect costs should be included in a more detailed analysis.

3) Analysis

The analysis and evaluation part of this study is mainly based on GameAnalytic's report on global market trends named "Mobile Gaming Benchmarks" H1 2019 Edition that is based on 60k game devs, 100k games, and 1.2 billion MAU⁽¹⁾. Metrics calculated in this study are compared with the same genre's (casual) results in that report.

According to GameAnalytic's report:

- Average D1 Retention is 26%, the prototype's is 51%, which is 96% higher
- Average D7 Retention is 7%, the prototype's is 15%, which is 114% higher
- Average D28 Retention is 3%, the prototype's is 4.5% which is 50% higher
- Average session length is 7 minutes, the prototype's is 9.7 minutes which is 38% higher
- ARPPU is 8 \$/user, the prototype's is 5.36 \$/user which is 33% lower
- ARPDau is \$0.03, the prototype's is \$0.088 which is 193% higher
- CPI is \$0.30, the prototype's is \$0.704 which is 134% higher. If we consider the eCPI, the comparison looks better at a rate 51% higher.

According to another article⁽²⁾, written by Andrew Chen⁽³⁾, this prototype's;

- D1 Retention is nearly as good as top 100 apps
- D3 Retention is above average
- D7 Retention is slightly below average
- D14 Retention is below average
- D30 Retention is below average
- D60 Retention is below average
- D90 Retention is below average

Although this comparison draws a pessimistic picture, especially for the Retention rates after D7, it should be noted that this article is based on all kinds of app's, not just mobile games, let alone casual games.

4) Results & Conclusion

In conclusion, based on the analysis and insights above, it can be seen that although the game's Return on Investment is currently negative, considering the fact that it has a very good level of user engagement and LTV is 3.5 times higher than eCPI, it **SHOULD BE LAUNCHED**. Comparing LTV with eCPI shows that if advertising (and therefore the related expenses) stops today, and even if there are no additional organic installs going forward (which is very unlikely, but just to be on the safe side), ROI will quickly (in 4.15 days to be exact) recover and the game will be a profitable one for the company, given that it will have a similar average DAU and LTV.

However, considering that the game's user engagement rates and the LTV/eCPI ratio is very high, there might be a couple of opportunities to increase the game's profit generation and business value.

It is clear that the game has a lot of room to be more flexible in terms of business strategy. As long as the LTV/eCPI ratio is kept above the desirable minimums and the market average, several parameters of the game's mechanics, economics, and the ad strategy can be adjusted towards a more revenue-generating model. To do this, several business suggestions can be made:

- If the game has any reward system (e.g. giving an item every 5 minutes), the frequency and/or value of these rewards can be lowered.
- New levels/steps can be a bigger challenge to reach, directing users towards making more in-app purchases.
- Overall pricing of the items in the game can be more aggressive.
- Dynamic pricing (if the game has it) of the items in the game can be more aggressive.
- Notifications can be more frequent.
- Ad frequency and/or length can be increased.
- More ads from rival games can be shown to the most loyal users.
- Different types and formats of ads can be tried.

And so on. In order to give more depth to these suggestions, different locations are compared and the results are as following:

- Top 6 countries with total # of installs is taken into account, these add up to 99.36% of the total users and are as following:
 - o Canada (90,669 users)
 - o Australia (53,612 users)
 - o Denmark (24,530 users)
 - o The Netherlands (22,144 users)
 - o New Zealand (5,181 users)
 - o The USA (475 users)
- LTV/eCPI ratios for these countries are as following:
 - o Canada: $(LTV) / (eCPI) = \$1.69 / \$0.55 = 3.04$
 - o Australia: $(LTV) / (eCPI) = \$1.98 / \$0.45 = 4.38$
 - o Denmark: $(LTV) / (eCPI) = \$1.40 / \$0.34 = 4.12$
 - o The Netherlands: $(LTV) / (eCPI) = \$0.74 / \$0.15 = 4.84$
 - o New Zealand: $(LTV) / (eCPI) = \$1.73 / \$0.31 = 5.55$
 - o The USA: $(LTV) / (eCPI) = \$0.93 / \$0.00 \sim \infty$

Finally, these results show that suggested strategy changes can be applied in especially in the USA, New Zealand, and the Netherlands.

5) References

- 1- "Mobile Gaming Benchmarks" by GameAnalytics:
<https://pages.gameanalytics.com/rs/686-EPV-320/images/H1-2019-Mobile-Benchmarks-Report-GameAnalytics.pdf>
- 2- "New Data Shows Losing 80% of Mobile Users is Normal" by Andrew Chen:
<https://andrewchen.co/new-data-shows-why-losing-80-of-your-mobile-users-is-normal-and-that-the-best-apps-do-much-better/>
- 3- Andrew Chen Biography:
<https://andrewchen.co/about/>