



# Pixel Art Game

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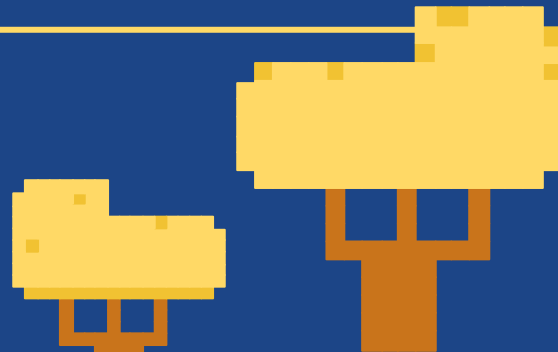
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# 01

# ABOUT DATASET

Introduce dataset and case study





# INTRODUCTION



## Information of case study

1. All users in Russia and using Android devices are playing the game with version 1.5.2.
2. Imagine you are a LiveOps team member and after working on data of game version 1.5.2, you found that the tutorial was not good for the users experience.
3. Hence, you decided you would roll out a new version 1.6.0 to change the Tutorial in-game and you expected this would help increase user experience.

## About dataset

1. The game version **1.6.0** has rolled out **50%** since **28-10-2023**, meaning 50% of new users will keep playing game version **1.5.2** and **50%** of the remaining will play the new version 1.6.0.
2. Period: **Oct 28th, 2023 - Nov 10th, 2023**

## Questions

1. How can we know if the improvement of Tutorial in-game version 1.6.0 has impacted the User Experience better than in-game version 1.5.2?
2. Can we roll out 100% game version 1.6.0 to all users or not? Why?
3. Based on the data and your experience with the game, do you have any ideas to improve our User Experience?



# 02

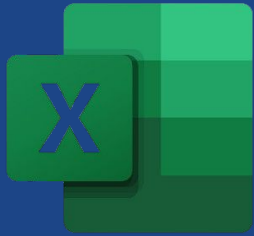
## DATA PROCESSING

Data processing and issues





## TOOLS



**Excel**

Validate data from query  
using SQL Server



**SQL Server**

Check data and query to  
answer some questions  
analysis



**Power BI**

Using to data visualization



**PYTHON**

Using to Z-test



## ISSUE 01



	user	num_of_day0
1	109af4536eaa15b4512bdd439b469f63	2
2	6cec003a839b3560eeb94fba674488dd	2
3	3240ebc3ea65615b27c992f23f32d1f3	2
4	adfecf41987d22fad5e994732b8fc7de	2

} —————> Delete user

} —————> Analysis in the next section

*Using SQL Server to query and Excel to validate data*

There are 4 users have 2 day0

Among them, first user didn't come back the next day

The remaining users come back the next day, but just only one day (with day\_diff = 1)



## ISSUE 02




# 472

users

View guide more than once time in a day

Moreover, some users have a status of "not finished" for viewing the guide or have clicked the skip button. They view some steps, after which they exit the app.








## ISSUE 03



	user 	num_of_finished_status
1	7bcc44e7-341c-448e-b2c7-3c605ff889a3	2
2	8ce97d49-9f44-4d31-b319-9b876a3362c7	2
3	937f827c8ec3a454c6d6b43216947615	2
4	9d45d60d-32ef-4c63-a494-ab7fb178ee26	2

Deleted users at ISSUE 02

*Using SQL Server to query and Excel to validate data*

There are 4 users with a "finished view guide" status count (quantity = -2) that does not match the "start view guide" status count (quantity = -1)

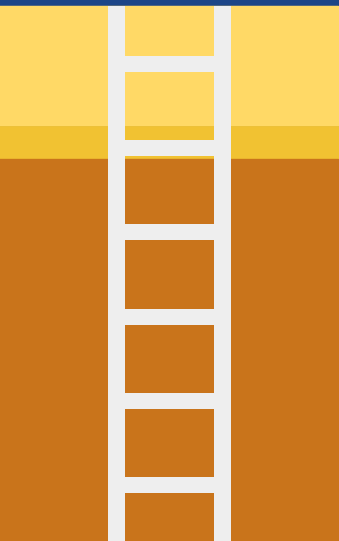
For the first user, the status counts are the same, but they are not sorted



# 03

## ANALYSIS

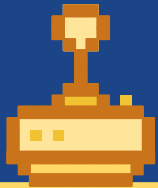
Analysis and answer some questions of case study





# A. VIEW GUIDE

Analysis of user behavior in viewing the guide





## NAMING RULES



Only users with event\_name = "tutorial" and deleted users from  
ISSUE 01 and ISSUE 02



**New Users**

day\_diff = 0

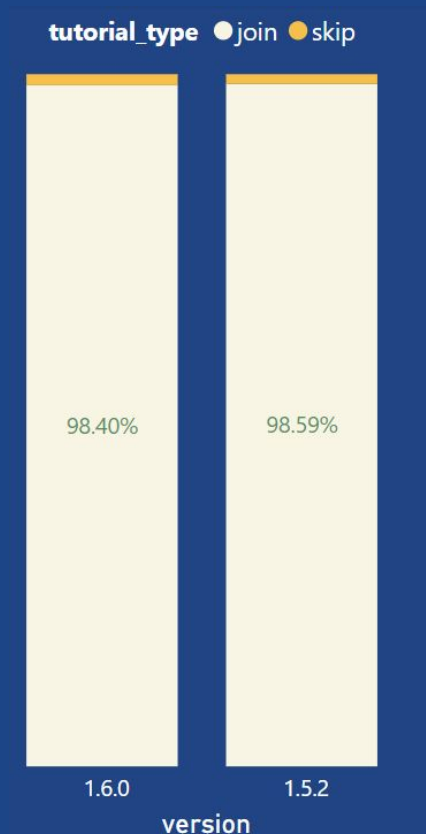


**Old Users**

day\_diff <> 0



## NEW USERS



join: users with a **quantity** = -1

skip: users **not in "join"** with a **quantity** = 0

Most people **choose to view the guide** in both versions (**over 98%**)

Only **a few** people choose to **skip the guide**

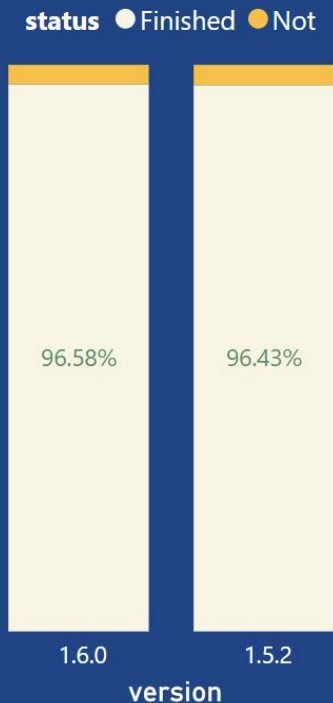
The new version (1.6.0) has a **lower guide view percentage** than the old version (1.5.2), but the difference is not significant



## NEW USERS



Only users who choose to view the guide (join)



- Finished: users who completed viewing the guide (**quantity = -2**)
- Not: users who didn't complete viewing the guide (**quantity = 0**)

Most people **finished** viewing the guide in both versions (**over 96%**)

Only **a few** people **didn't finish** viewing the guide

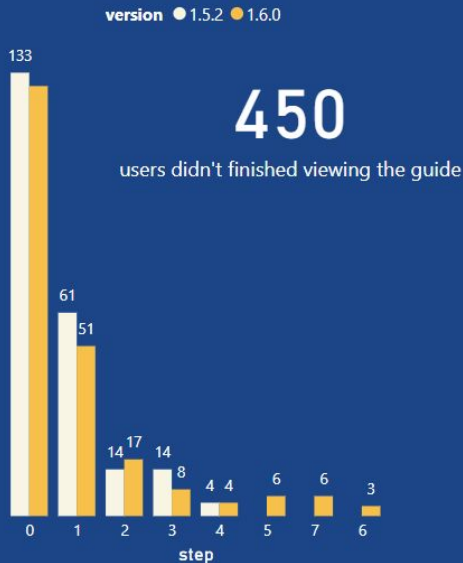
The new version (1.6.0) has a **higher guide completion percentage** than the old version (1.5.2), but the difference is not significant



## NEW USERS



Only users who choose to view the guide (join) and have a status of “Not finished”



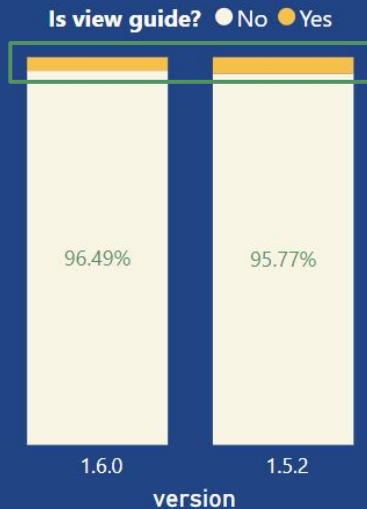
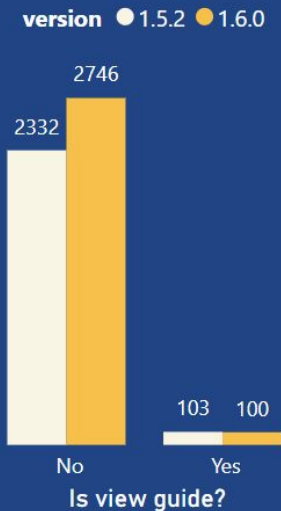
Version	1.5.2		1.6.0		Total	
Step	Number users	Percent	Number users	Percent	Number users	Percent
0	133	29.56%	129	28.67%	262	58.22%
1	61	13.56%	51	11.33%	112	24.89%
2	14	3.11%	17	3.78%	31	6.89%
3	14	3.11%	8	1.78%	22	4.89%
4	4	0.89%	4	0.89%	8	1.78%
5			6	1.33%	6	1.33%
6			3	0.67%	3	0.67%
7			6	1.33%	6	1.33%
Total	226	50.22%	224	49.78%	450	100.00%

**Most people** choose to **skip** the guide **right from the start** (step = 0)

Overall, more people follow the guide step-by-step before skipping it in the new version compared to the old version



## OLD USERS



**203** old users viewed the guide on the following days.

**Most people understand the guide;** only a few view it after day 0.

This includes:

- New users didn't view the guide on day 0.
- New users viewed the guide on day 0 and viewed it again on the following days.

The new version (**1.6.0**) has a slightly **lower repeat view percentage** than the old version (1.5.2), but the difference is not significant.





## OLD USERS



# 203

old users viewed the guide on the following days



The new version (1.6.0) has **fewer repeat views of the guide** compared to the old version.

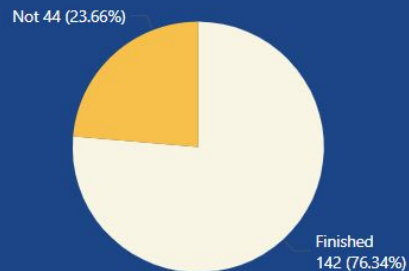
Moreover, in the **new version**, users viewed the guide a **maximum of two times**, whereas in the **old version**, two users viewed it **three times**.



## OLD USERS



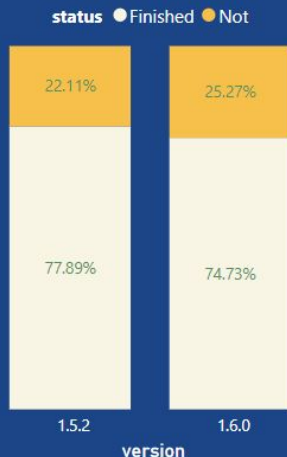
Only users who viewed the guide once (previous slide)



Finished: users completed viewing the guide



Not: users have not completed viewing the guide



Over **76%** of people **finished** viewing the guide after choosing to view it again, while around 24% didn't finish the guide

The new version (1.6.0) has a slightly lower guide completion rate than the old version, with a difference of about 3%

## └ z-test on viewing instructions ─

Is there a difference between the completion rates of the tutorial in the old version and the new version?

	version	total_user	user_completed	completion_rate
0	1.5.2	6557	6317	0.963398
1	1.6.0	6783	6547	0.965207

$Z = -0.56$

P-value = 0.5733

There is no difference between the 2 versions.

Is there a difference in the review ratings of the instructions between the old version and the new version?

	version	Count of user	Is view guide?
0	1.6.0	2746	No
1	1.5.2	2332	No
2	1.5.2	103	Yes
3	1.6.0	100	Yes

$Z = 1.35$

P-value = 0.1771

There is no difference between the 2 versions.



## A. VIEW GUIDE



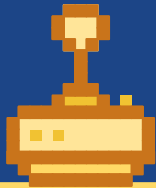
There is not much difference in guide views between both versions. However, the number of users who followed the guide step-by-step in the new version is higher than in the old version. This may be because users in the new version understood the guide faster, as they repeated the guide a maximum of twice, whereas in the old version, some users repeated it three times.





## B. RELEASE APP

Is it possible to roll out game version 1.6.0 to all users at 100%?

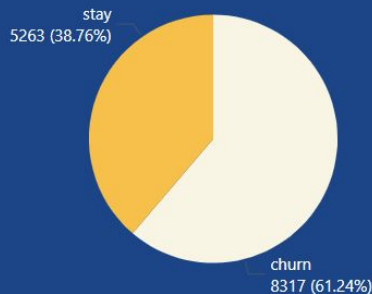




## RETURNING USERS ?



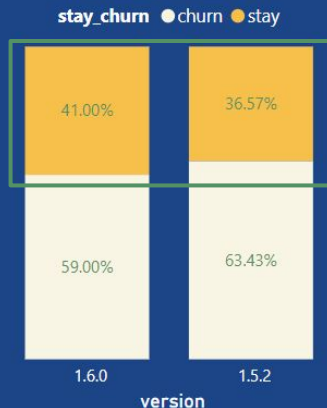
Only users who were deleted from ISSUE 01 and ISSUE 02



churn: users who have a day\_diff = 0



stay: users who have a day\_diff <> 0



Most people churn both versions (over 61%). **Around 40% people continue using the app**

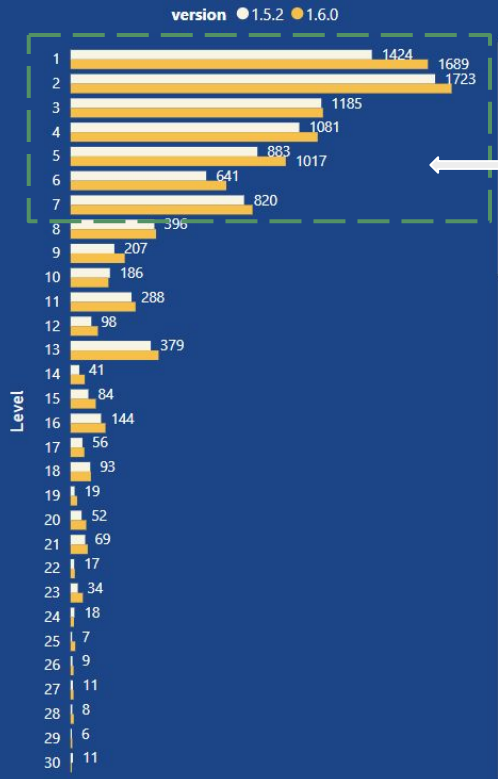
The new version (**1.6.0**) has people **stay higher** than old version (different over 4%)



# RETURNING USERS ?

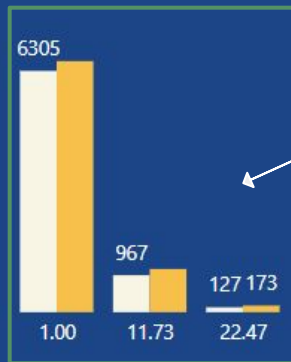


Only users who were deleted from ISSUE 01 and ISSUE 02

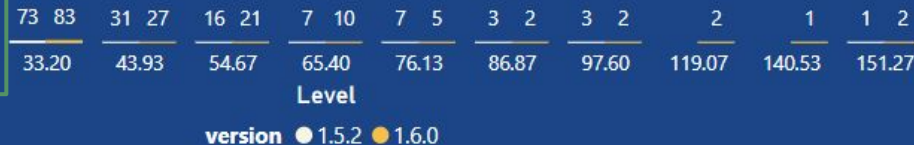


Most people played from level 1 to level 7. After that, there was a **decrease starting from level 8.**

Overall, **users** in the **new version played more levels** than those in the **old version.**



For the first **20 levels**, **users played more**, and the new version has more users playing compared to the old version



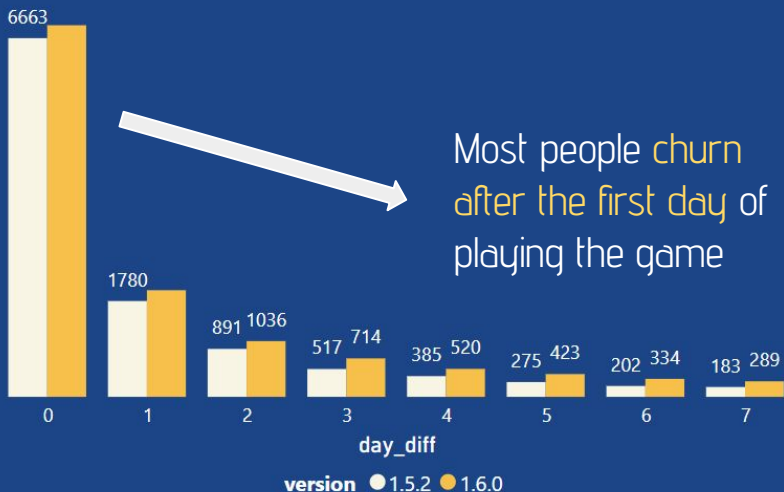


## RETURNING USERS ?



Only users who were deleted from ISSUE 01 and ISSUE 02

Although the new user acquisition rate per day in the new version is lower than in the old version, the daily decrease rate of new users in the new version is more stable than in the old version



Month	0	1	2	3	4	5	6	7	Total
October									
28	100.00%	1.61%	0.65%	0.32%	0.32%			0.32%	100.00%
29	100.00%	3.85%	0.51%	0.51%	0.26%	0.26%	0.26%	0.26%	100.77%
30	100.00%	1.44%	0.72%	0.24%				0.24%	100.48%
31	100.00%	3.83%	0.82%	0.27%			0.27%	0.27%	100.27%
November									
1	100.00%	2.77%	1.23%	1.23%	0.31%			0.31%	100.62%
2	100.00%	2.97%	0.33%	0.33%	0.33%	0.33%			100.33%
3	100.00%	2.27%		0.65%			0.32%		100.65%

version  
■ 1.5.2  
□ 1.6.0

Month	0	1	2	3	4	5	6	7	Total
October									
28	100.00%	2.41%	1.51%		0.60%				100.60%
29	100.00%	2.04%	1.13%	0.45%			0.45%	0.23%	100.45%
30	100.00%	1.83%	0.46%	0.69%	0.23%	0.23%	0.23%		100.69%
31	100.00%	1.91%	0.85%	0.42%	0.21%			0.21%	100.00%
November									
1	100.00%	0.99%	0.99%	0.25%	0.25%		0.49%	0.25%	100.25%
2	100.00%	2.87%	0.57%	0.29%		0.29%			100.57%
3	100.00%	1.37%		0.27%		0.27%	0.27%		100.27%

version  
□ 1.5.2  
■ 1.6.0



# USER INTEREST IN THE GAME

Only users who were deleted from ISSUE 01 and ISSUE 02

Month	0	1	2	3	4	5	6	7	Total
version									
1.5.2									
1.6.0									
October									
28	100.00%	1.61%	0.65%	0.32%	0.32%			0.32%	100.00%
29	100.00%	3.85%	0.51%	0.51%	0.26%	0.26%	0.26%	0.26%	100.77%
30	100.00%	1.44%	0.72%	0.24%				0.24%	100.48%
31	100.00%	3.83%	0.82%	0.27%			0.27%	0.27%	100.27%
November									
1	100.00%	2.77%	1.23%	1.23%	0.31%			0.31%	100.62%
2	100.00%	2.97%	0.33%	0.33%	0.33%	0.33%			100.33%
3	100.00%	2.27%		0.65%			0.32%		100.65%

Month	0	1	2	3	4	5	6	7	Total
version									
1.5.2									
1.6.0									
October									
28	100.00%	2.41%	1.51%		0.60%				100.60%
29	100.00%	2.04%	1.13%	0.45%			0.45%	0.23%	100.45%
30	100.00%	1.83%	0.46%	0.69%	0.23%	0.23%	0.23%		100.69%
31	100.00%	1.91%	0.85%	0.42%	0.21%			0.21%	100.00%
November									
1	100.00%	0.99%	0.99%	0.25%	0.25%		0.49%	0.25%	100.25%
2	100.00%	2.87%	0.57%	0.29%		0.29%			100.57%
3	100.00%	1.37%		0.27%		0.27%	0.27%		100.27%

After playing on the first day, only a few users continued playing on the following days.

Overall, the retention rate after the first day in the **new version** is **better than** in the old version, and it remains more **stable over the following days** compared to the old version.

# USER INTEREST IN THE GAME

Only users who were deleted from ISSUE 01 and ISSUE 02



The average duration played in the new version is more stable than in the old version.

Maybe some users play every day more frequently in the new version compared to the old version.

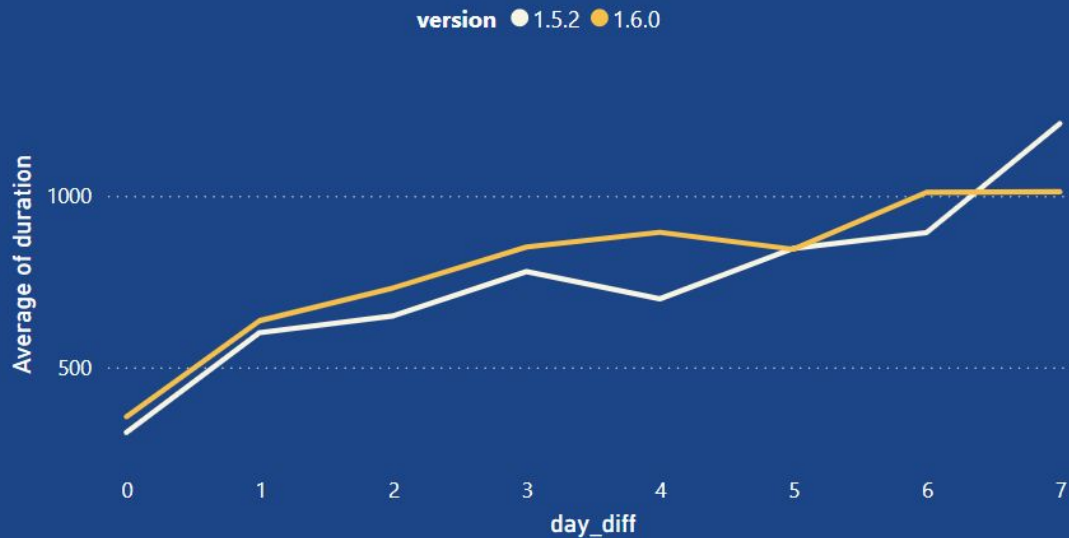
Although both versions follow the same trend, the new version does not show a sudden increase compared to the old version.

The average duration played is between 5 and 15 minutes

A sudden increase and a sudden decrease in the average duration played

## USER INTEREST IN THE GAME

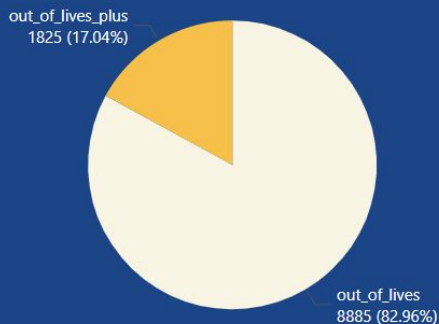
Only users who were deleted from ISSUE 01 and ISSUE 02



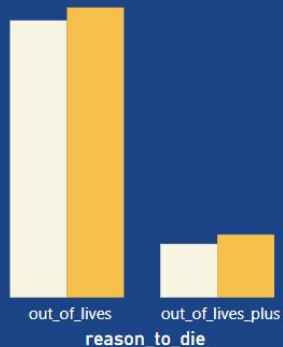
Similar to the previous slide, the average duration played in the new version is more stable compared to the old version

## USER INTEREST IN THE GAME

Only users who were deleted from ISSUE 01 and ISSUE 02



version ● 1.5.2 ● 1.6.0



Similar to the previous slide, the average duration played in the new version is more stable compared to the old version

The **new version** has a **higher number of users** who choose to **view advertisements** to get more lives after losing

## ✚ z-test on churned rate and used live plus ✚

Is there a difference between the churn rates of the old version and the new version?

	version	Count of user	stay_churn
0	1.5.2	4230	churn
1	1.6.0	4087	churn
2	1.6.0	2840	stay
3	1.5.2	2439	stay

Z-stat = 5.294662020967035

p-value = 5.961836577265189e-08

The churn rate of the new version is lower.

Is there a difference between the used live plus rates of the old version and the new version?

	reason_to_die	Count of user	version
0	out_of_lives	4546	1.6.0
1	out_of_lives	4343	1.5.2
2	out_of_lives_plus	986	1.6.0
3	out_of_lives_plus	839	1.5.2

Z-stat = -2.2468314574336454

p-value (one sided,  $1.6.0 > 1.5.2$ ) = 0.01232540026447687

The used live plus of the new version is higher.



## B. RELEASE APP



In the new version, the percentage of users who stay in the app is higher than in the old version, and the retention rate is more stable. The average duration played has increased more steadily than in the old version. Additionally, users in the new version show greater interest, as the percentage of users viewing advertisements to get more lives is higher compared to the old version.





04

SUMMARY





## VIEW GUIDE



### Impact of Tutorial Improvements in Version 1.6.0



- The guide of new version help users understanding faster
- However, not too much different both versions about changed guide





## RELEASE APP



### Rollout of Game Version 1.6.0 ?

- We can roll out 100% of game version 1.6.0 because the retention rate of the new version is higher and more stable compared to the old version.
- Users are more interested in the new version, as evidenced by the higher percentage of users choosing to view advertisements to get more lives.



05

PROPOSE



# PROPOSE



Here's my propose base on data and my experiences when I used the app:

1. Many have easy level in 20 first level. That maybe is the reason why decrease user from level 8. So we can decrease number of easy level when users start the game
2. We should be random levels like 2 easy level sections, 2 difficult level sections, etc.
3. Need to add "Next level" button or something like that when user win
4. Need permission user choose level they want to play

# THANK YOU!

Do you have any questions?

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