



Case Study

Course: Software Engineering
Instructor: Min yuh Day

Group 2



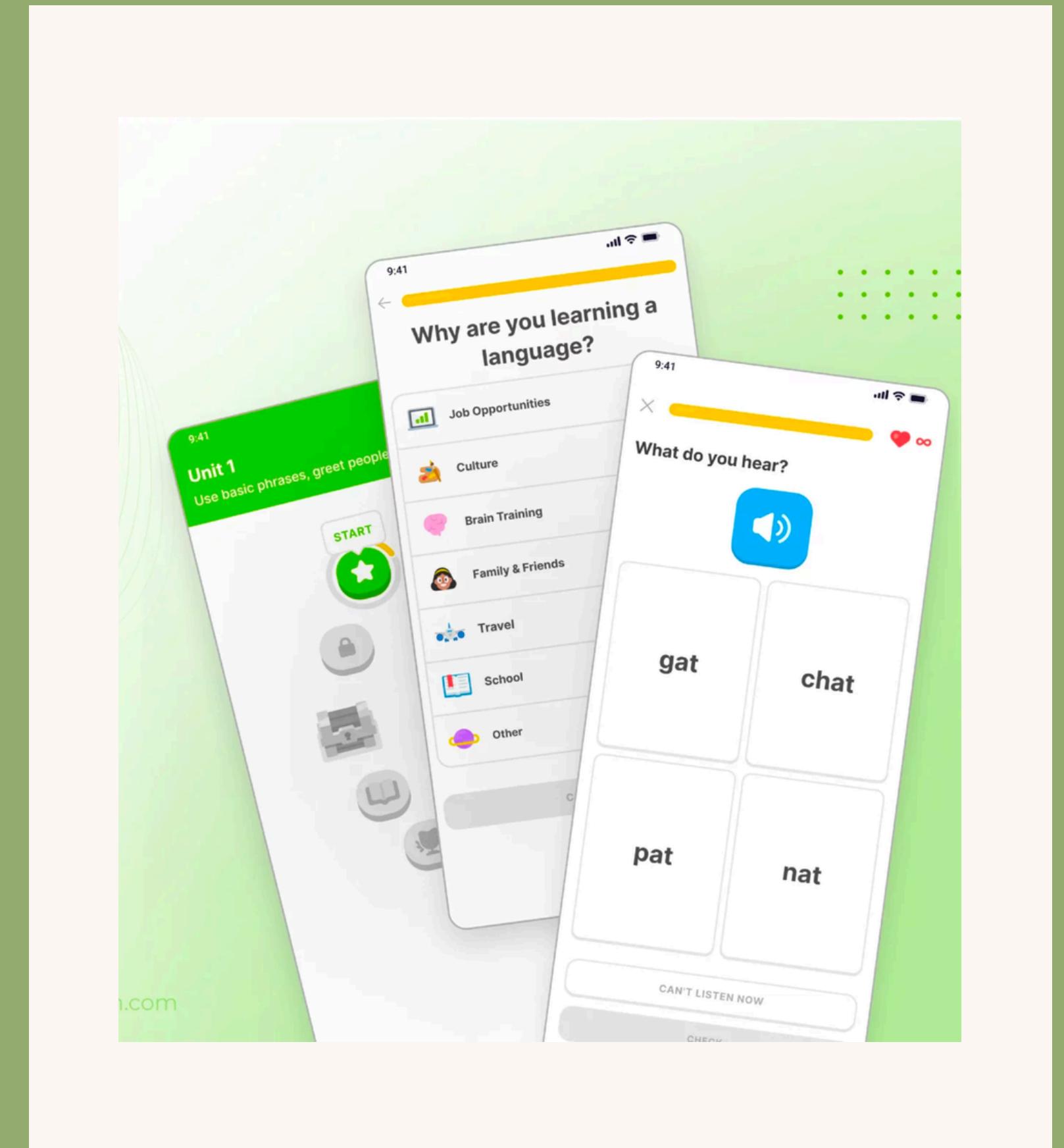
Infomation
Management
Yung-Hsin Chang
(Cindy)



Chinese
Ching-Chen Chiu
(Sunny)



Computer Science
Chieh-En Li
(Andrew)

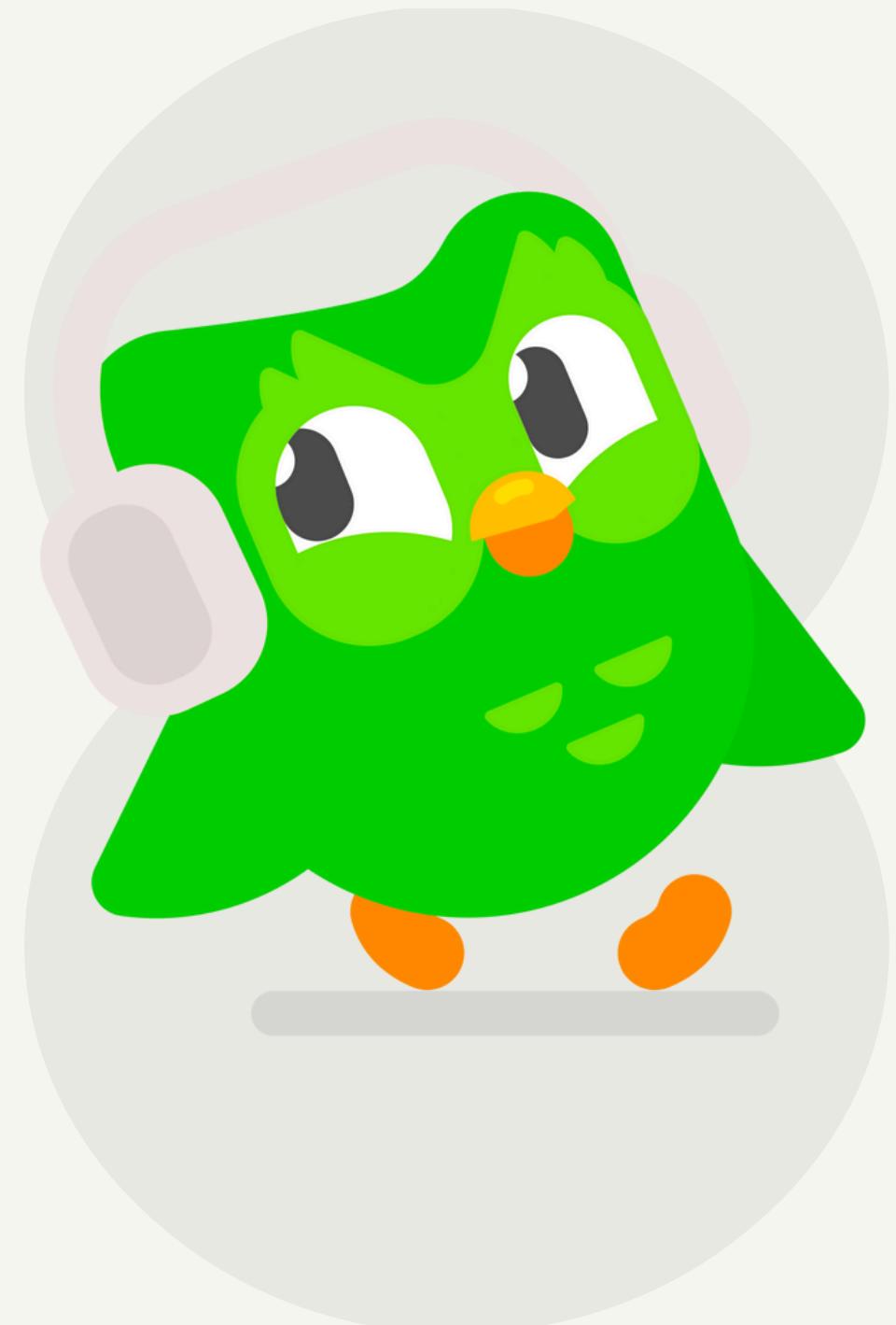


Date: 2024/03/27

The world's best way to learn a language

Outline

-  Background & Product Overview
-  Software Development
-  Innovation of Duolingo
-  Revenue Streams
-  User Growth Overview
-  Conclusion



Company Background



Chinese
Ching-Chen Chiu
(Sunny)

We will introduce the background of the creation of this app, as well as the main functions of Duolingo.

01. The motivation behind founding Duolingo

02. Product Overview

The motivation behind founding Duolingo



Luis von Ahn , he was born in Guatemala



Passionate about mathematics

- yet having to spend extra money to go abroad to take an English exam in order to study mathematics overseas.

This experience made him realize two things:

- 1. Education, especially English education, is a key factor for upward mobility.
- 2. Education within the system does not facilitate social mobility. In fact, it deepens class divisions.



<https://www.inside.com.tw/article/6137-luis-von-ahn-and-duolingo>

Product Features

你想學點什麼呢？
What do you want to learn?

用中文學習

- 英語 English
- 中文（粵語）Cantonese
- 日語 Japanese
- 韓語 Korean
- 法語 French

繼續

新單詞
選擇對應的圖片
Please choose the correct picture.

teacher

- 房子 house
- 老师 teacher
- 红色 red
- 电脑 computer

檢查

選擇聽到的內容

Are you a Chinese teacher?

不正確

你還有 4 顆紅心 You have 4 hearts left.

每錯一道題會消耗一顆紅心。你需要有紅心才能完成單元。

Each mistake costs 1 heart. You need heart to finish a lesson.

繼續

Encourage Continuous Learning – 1

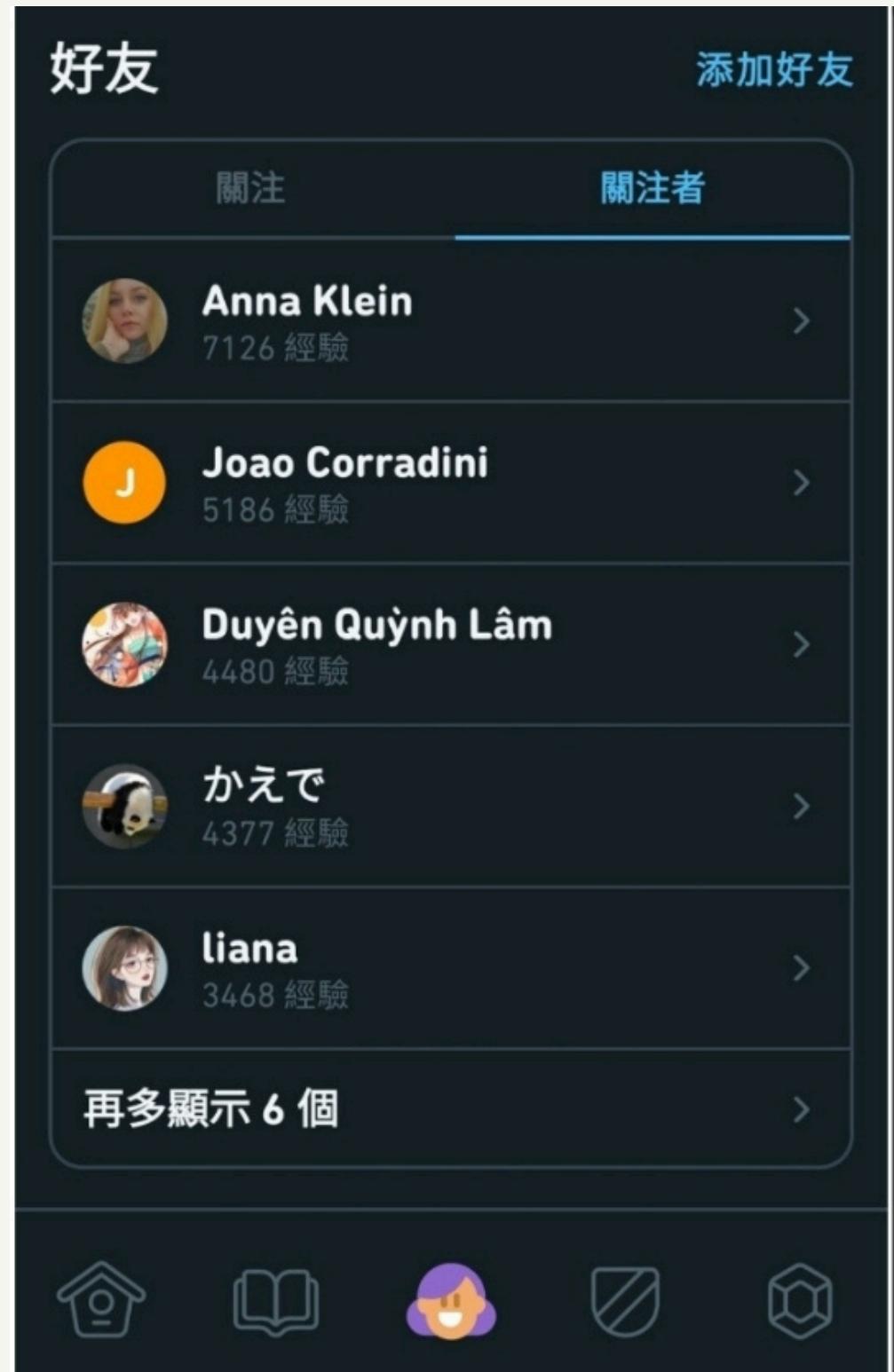


Operating the game with a leveling-up system.

- Each week, Duolingo randomly selects 30 members to participate in a competition.
- The competitive atmosphere encourages members to have a greater motivation for continuous learning.

<https://vocus.cc/article/61f15287fd89780001458bfd>

Encourage Continuous Learning – 2



<https://vocus.cc/article/61f15287fd89780001458bfd>



Encouraging mutual growth.

- You can mutually follow friends on the product, and the app will notify you when your friend achieves a particular milestone.
- Friends can use the 'high-five' feature to give encouragement when they see achievement notifications.



Software Development

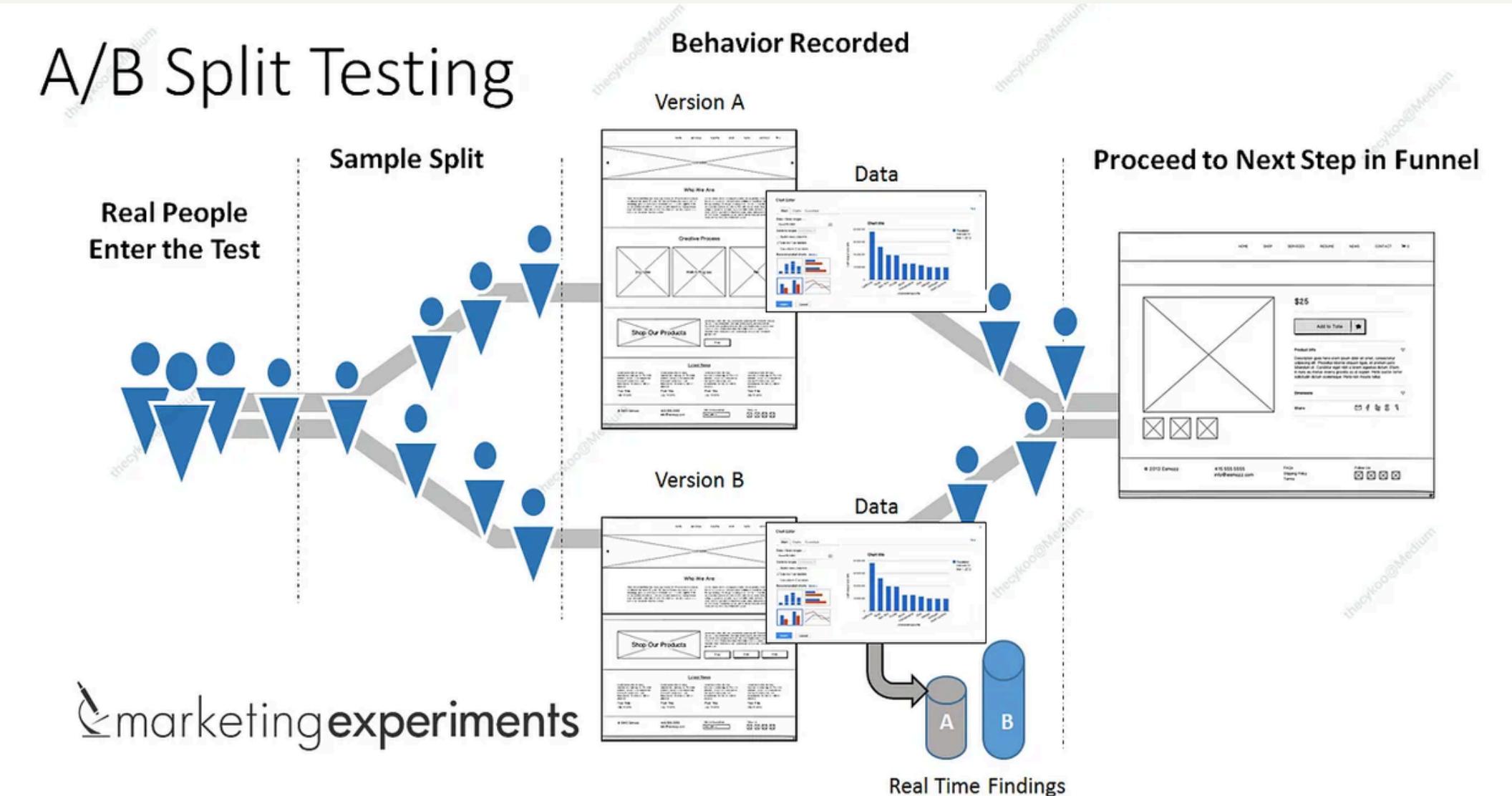
We will also introduce the AB test conducted by the app.

01. A/B Test Process

**02. Example of A/B
Test**

A/B Test

<https://medium.com/it-digital-%E4%BA%92%E8%81%AF%E7%B6%B2/a-b-%E6%B8%AC%E8%A9%A6-a-b-testing-%E4%BB%8B%E7%B4%94-website-optimization-%E5%85%A5%E9%96%80-42fbec813e11>



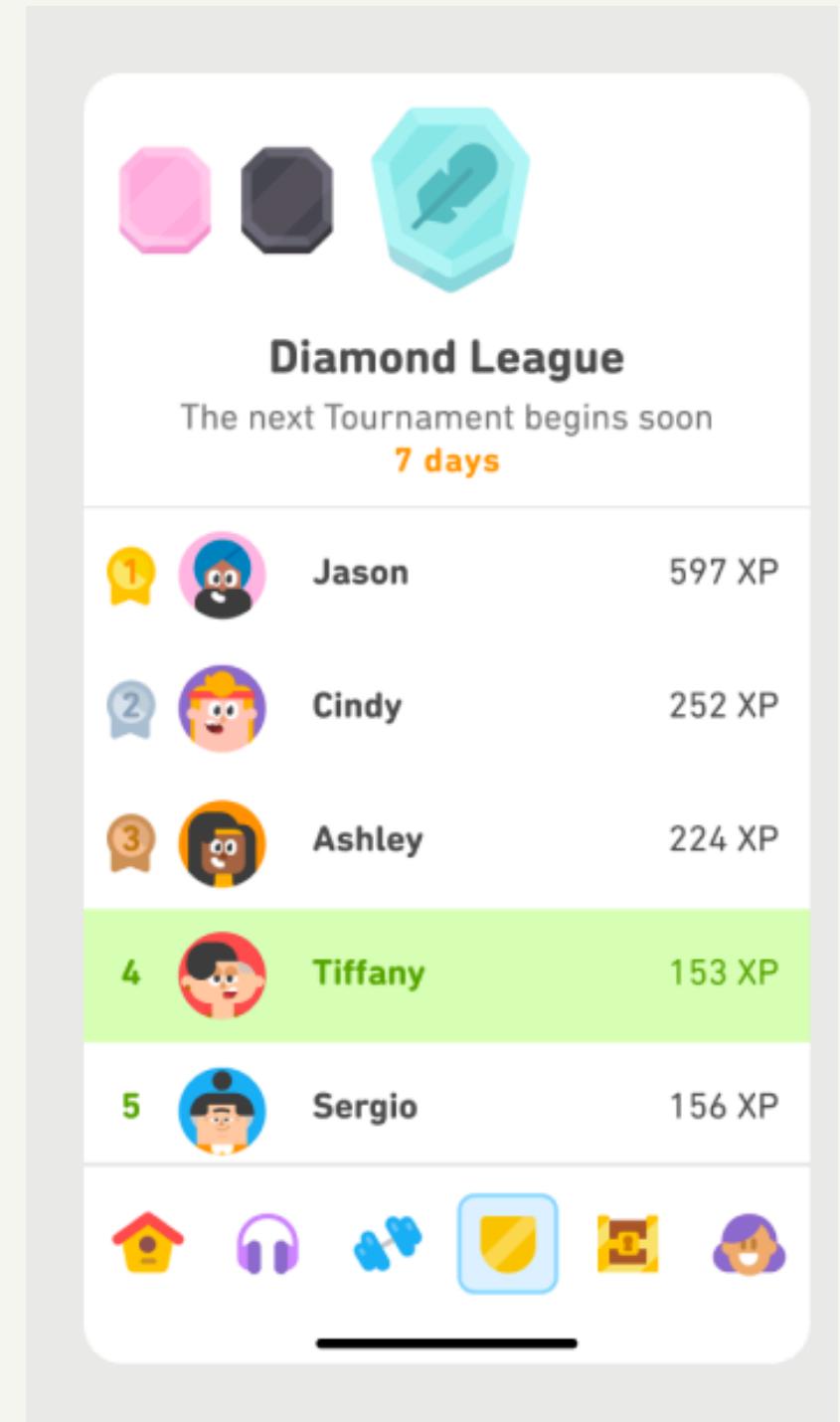
AB testing can be simplified into the following steps:

1. Set the testing goal.
2. Establish hypotheses on how to achieve the goal, and use them as the testing project.
3. Conduct the test and collect data.
4. Based on the results, launch the version with better performance, and continue testing new hypotheses.

Example of A/B Test

add Leaderboards to the iOS app

1. Test the number of total sessions start.
2. Test the number of total sessions end.



<https://blog.duolingo.com/duolingo-leagues-leaderboards/>

Example of A/B Test



This experiment resulted not only shows an increase in the number of lessons that learners started, but also in the number of lessons they completed.



launch the experiment to all users.

<https://blog.duolingo.com/improving-duolingo-one-experiment-at-a-time/>

Innovation of Duolingo



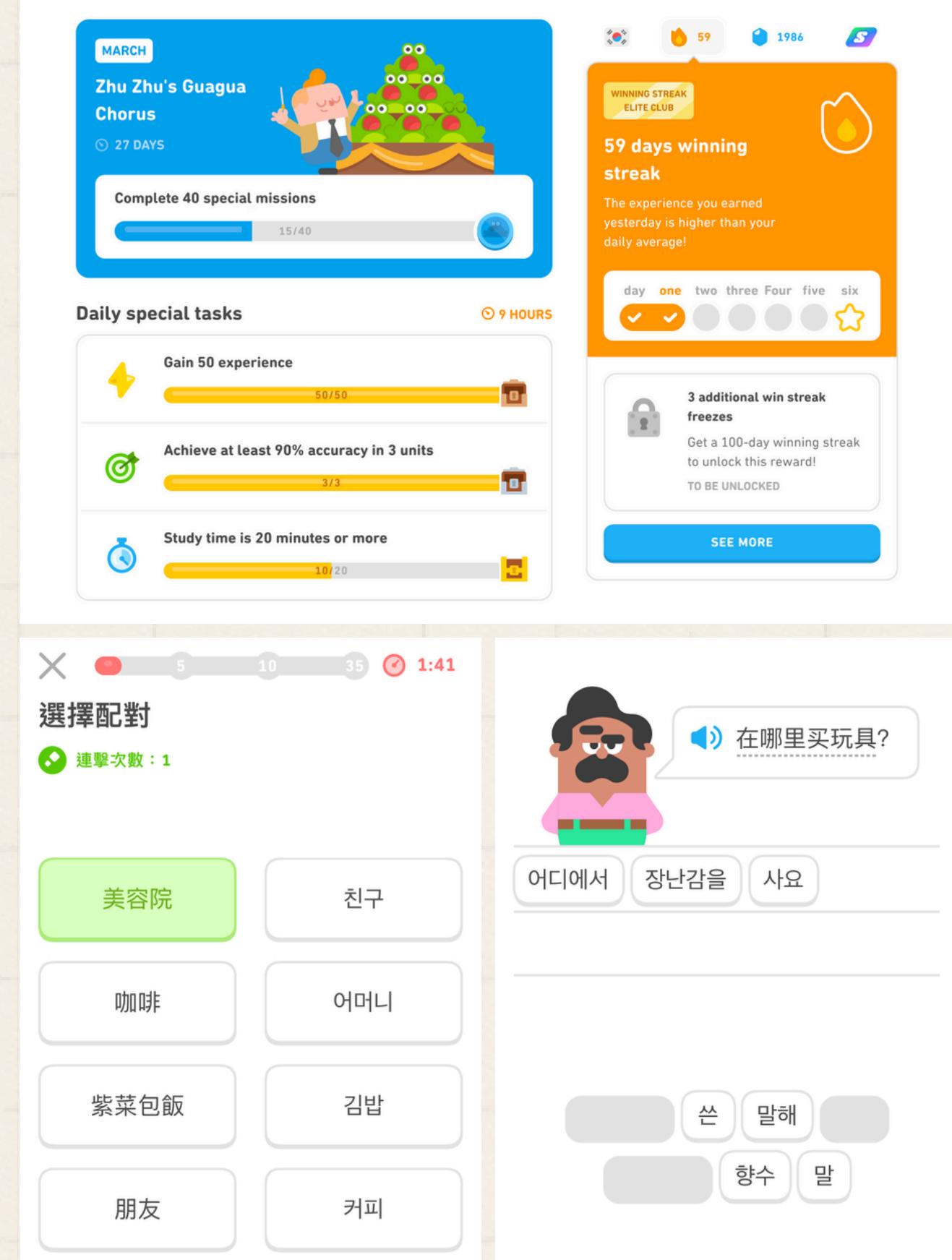
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Management
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These three innovations make education both effective and enjoyable, distinguishing Duolingo in the digital education space.

01. Gamification

02. AI and Personalized Learning Plans

03. Community Features and Interactive Learning



GAMIFICATION

Interactive Lessons

- variety of question types (e.g., blank-filling, matching, speaking, translation)

Continuous Login and Leaderboards

- maintain daily login to keep the fire burn.

Achievements and Rewards

- earn virtual diamonds, unlock new levels, and receive badges as they progress.

AI AND PERSONALIZED LEARNING PLANS

Adaptive Learning Algorithms

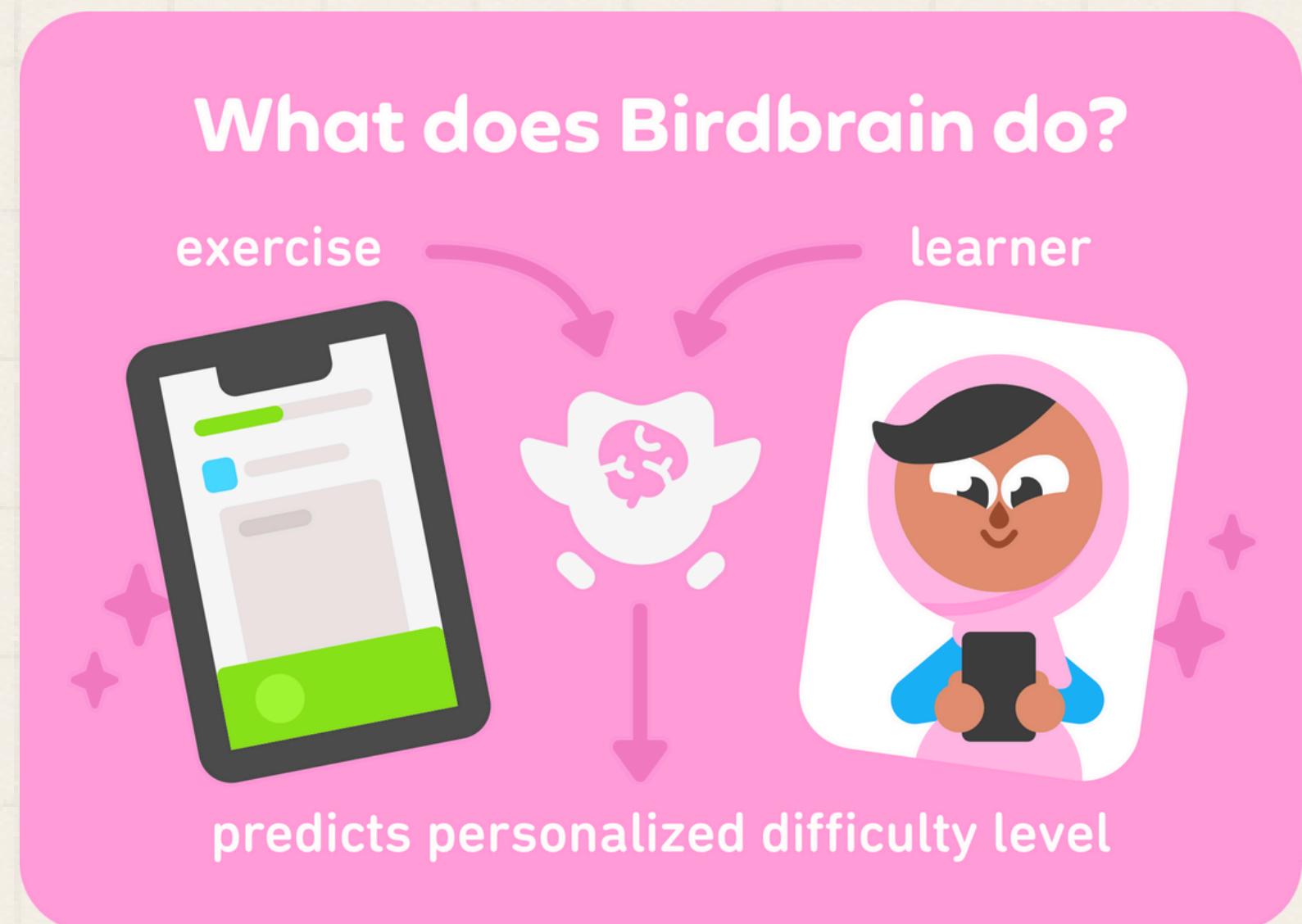
- adapting the difficulty of lessons based on the user's performance.

Spaced Repetition

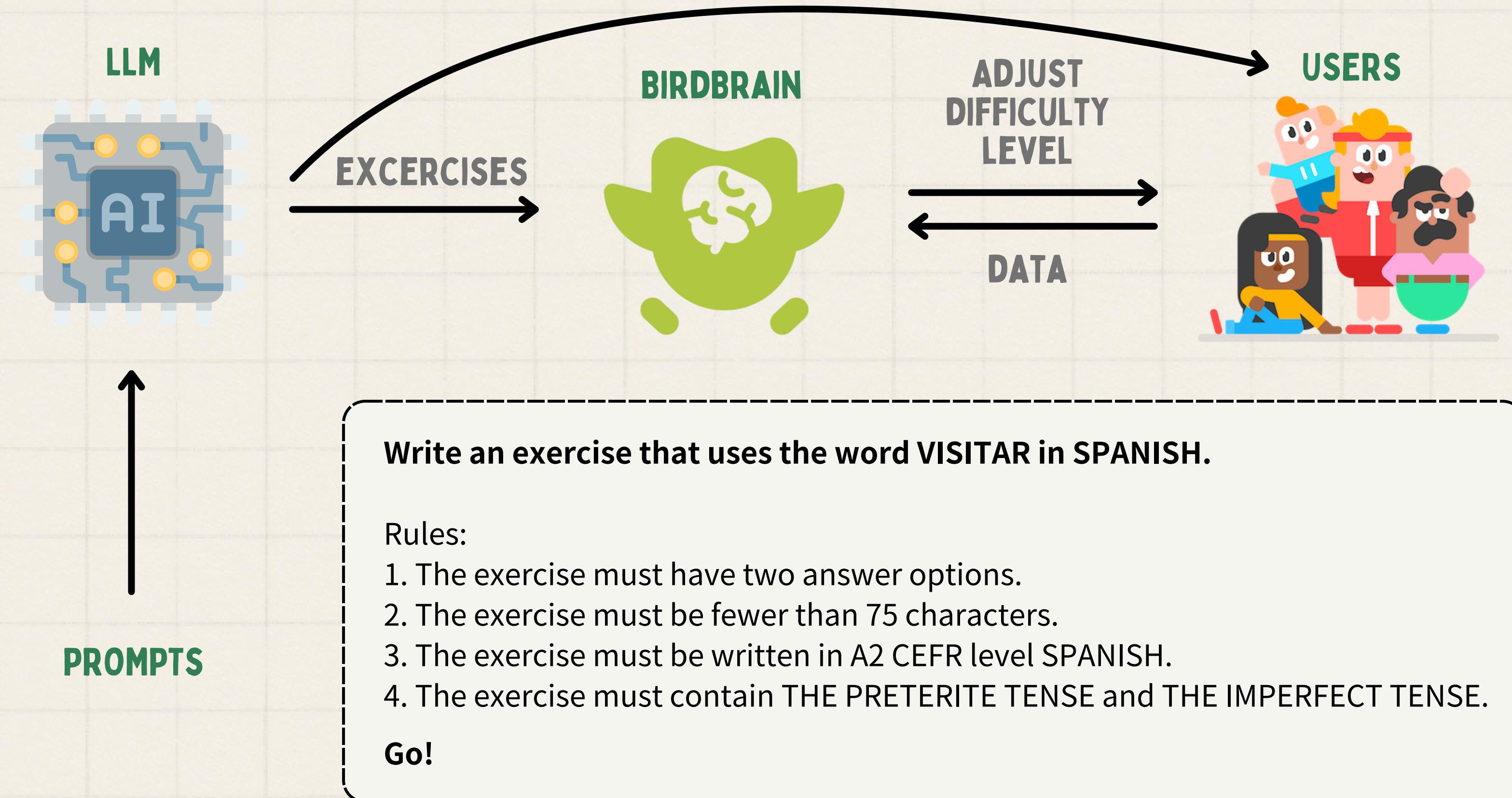
- employs AI to reminds users practicing at the optimal time.

BirdBrain & ChatGPT4

- your personalized AI coach
- using ChatGPT4 build a online AI tutor

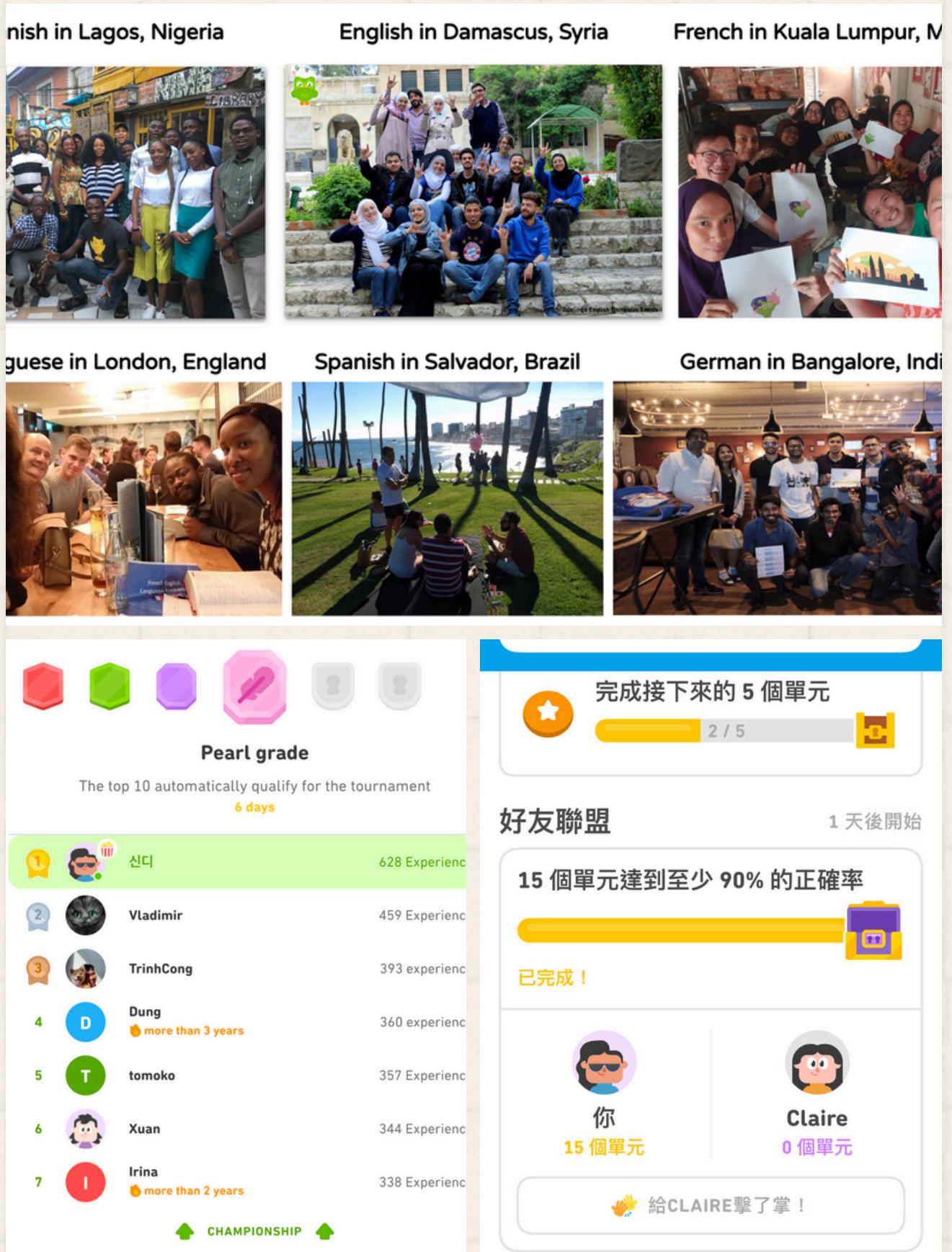


HOW DOES DUOLINGO USE AI & LLM



<https://blog.duolingo.com/learning-how-to-help-you-learn-introducing-birdbrain/>
<https://blog.duolingo.com/large-language-model-duolingo-lessons/>

<https://blog.duolingo.com/duolingo-events-lets-talk-about-talking/>



COMMUNITY FEATURES AND INTERACTIVE LEARNING

Socialize

- compete with people around the world.
- learners who add friends on Duolingo are 5.6x more likely to finish their course!

Duolingo Events

- often led by experienced Duolingo users or native speakers
- real-life communication and cultural exchange

Revenue Streams



Duolingo Plus Subscription

- No more advertisement
- Gain more XP
- unlimited skill tests
- direct source of revenue



In-App Purchases

- power-ups
- streak repairs
- bonus skills
- virtual goods

Advertisements

- free version of Duolingo displays ads to users after completing lessons



Duolingo English Test

- convenient, fast, affordable
- accepted by over 5000 universities and institutions worldwide

(in millions)	Q4 2022	Q4 2023	Change	% Change	2022	2023	Change
Subscription	\$78.1	\$117.5	\$39.3	50 %	\$273.5	\$404.7	\$131.2
Advertising	11.1	13.5	2.3	21	44.7	49.9	5.1
Duolingo English Test	8.4	10.8	2.4	29	32.7	41.2	8.5
In-App Purchases	5.9	8.9	3.1	52	17.9	34.7	16.8
Other	0.3	0.3	0.0	12	0.6	0.7	0.1
Total revenues	\$103.8	\$151.0	\$47.2	45 %	\$369.5	\$531.1	\$161.6

User Growth Overview

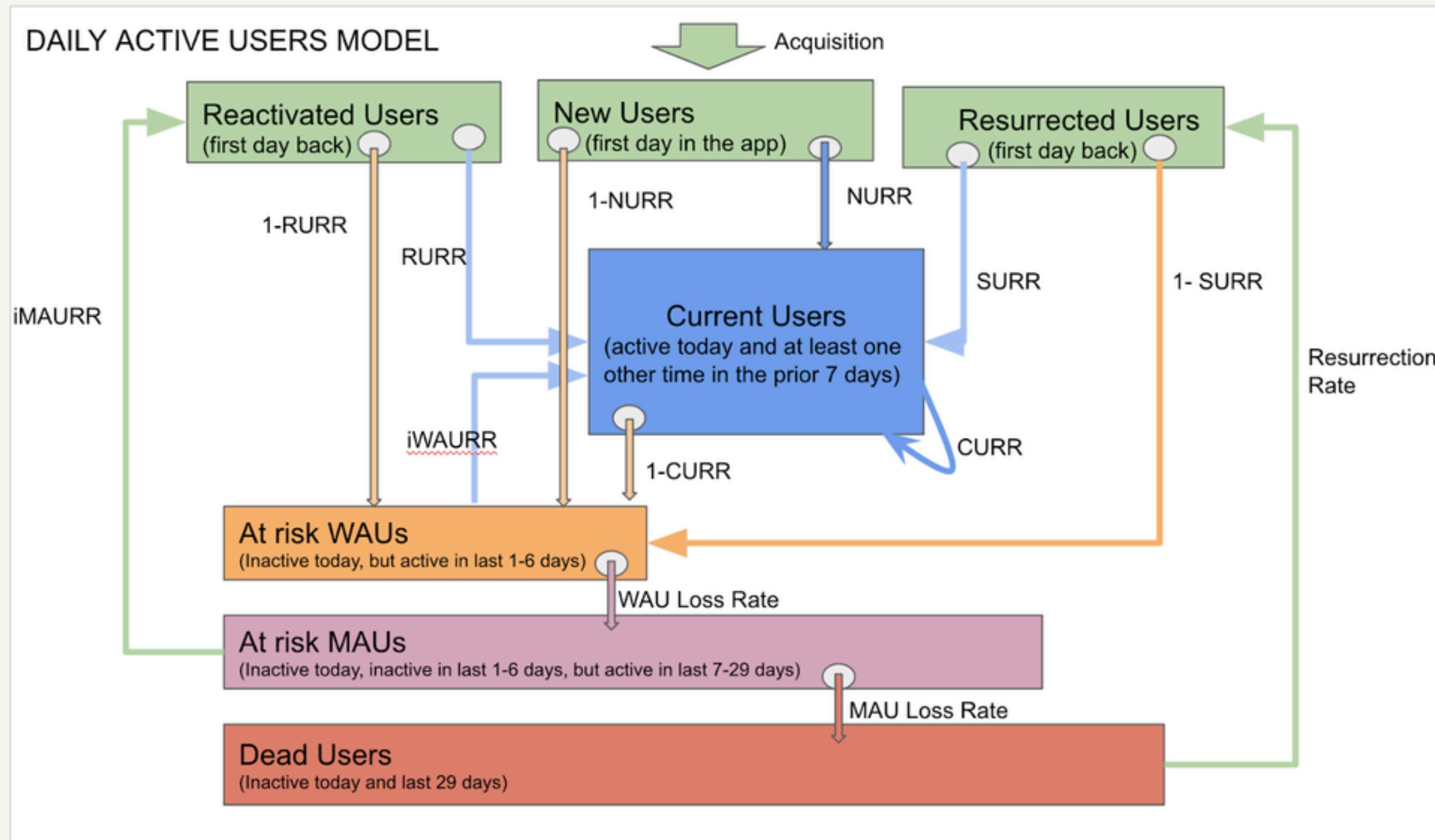


Computer Science
Chieh-En Li
(Andrew)

01. Customer retention strategies

02. DAUs, MAUs,
Paid Subscribers

Customer retention strategies.



The brilliance of this chart lies in the fact that each user appears in only one square, without repetition, making the flow of users very clear.

Customer retention strategies.

Lever	Impact on MAU in 3 years	Impact on DAU in 3 years
New Users	+11%	+11%
Resurrected Users	+10%	+11%
Current User Retention Rate	+12%	+75%
New User Retention Rate	+0.4%	+2%
Reactivated User Ret. Rate	+0.1%	+0.9%
Resurrected User Ret. Rate	+0.1%	+1%
Inactive WAU React. Rate	+2.5%	+15%
Inactive MAU React. Rate	+3%	+7%

The conclusion is that the growth rate of "Current User Retention Rate (CURR)" is the best, and three years later, the Daily Active Users (DAU) will grow by a remarkable 75%.

Customer retention strategies.

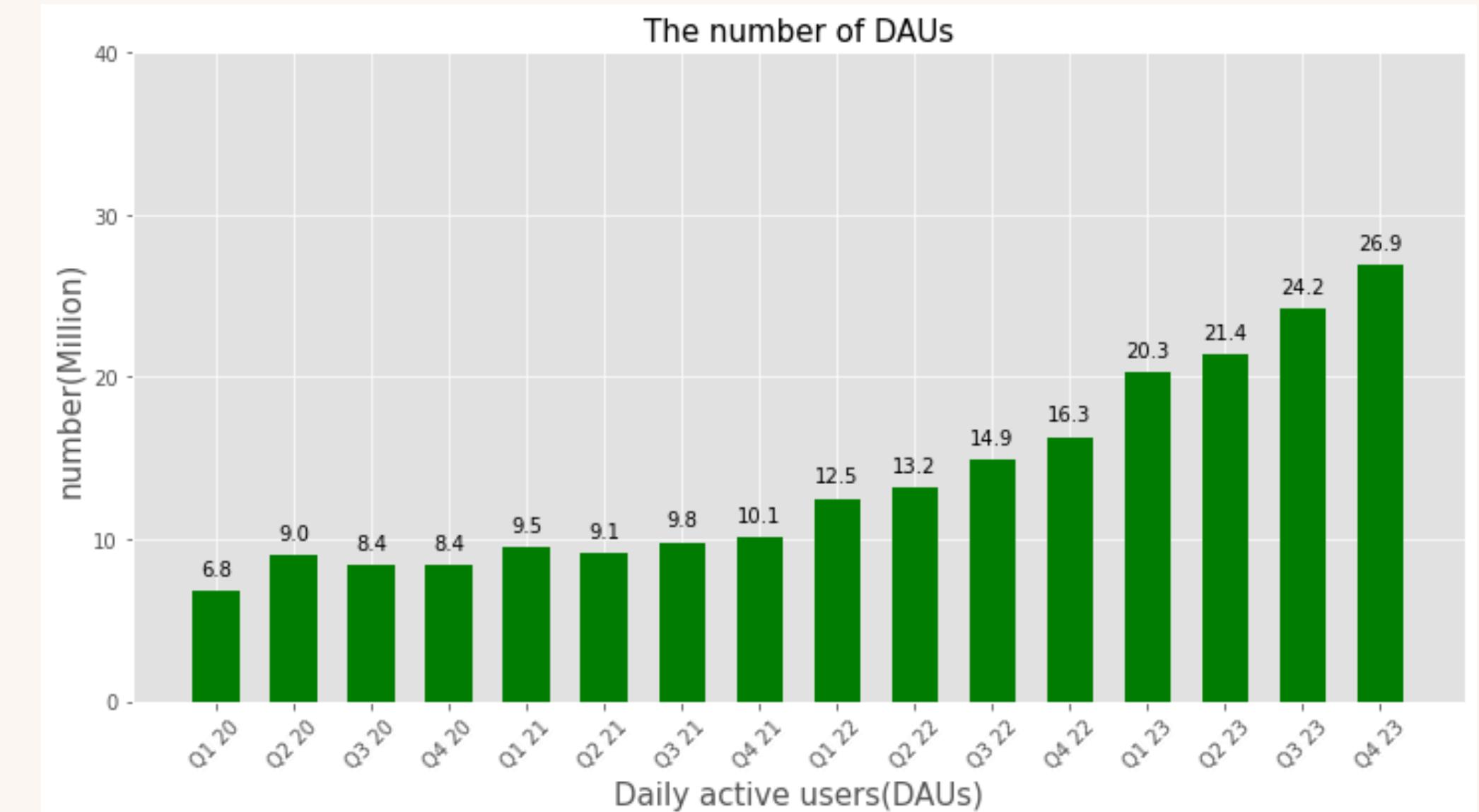


<https://yujih.com/blog/how-duolingo-succeed/>

They set this as their goal and successfully achieved 4.5 times increase in DAU from 2019 to 2022!

Daily Active Users (DAUs).

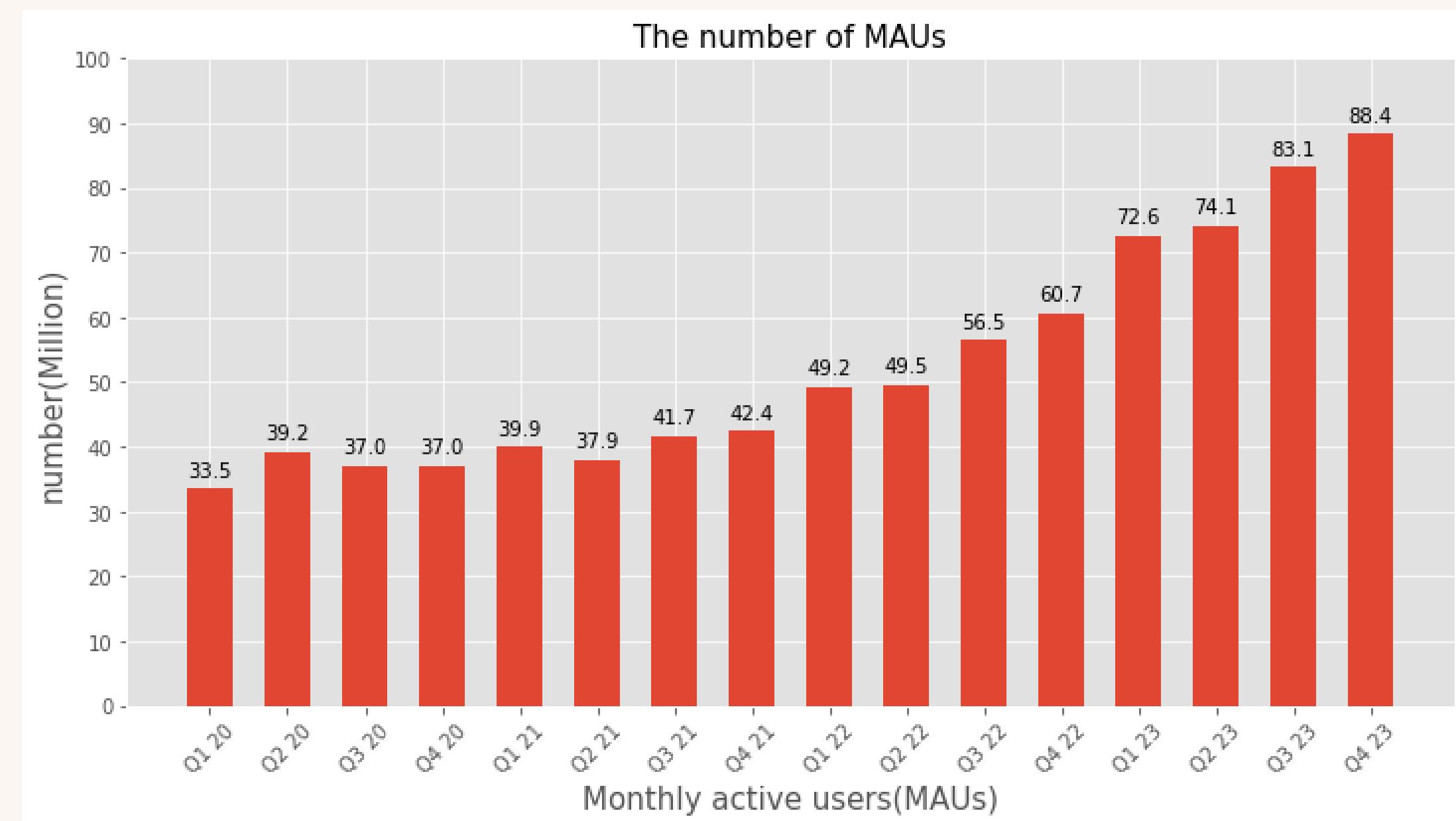
DAUs are defined as unique users who engage with our Duolingo App or the learning section of our website each calendar day. DAUs are a measure of the consistent engagement of our global user community on Duolingo.



<https://icrm.indigotools.com/IR/IAC/?Ticker=DUOL&Exchange=NASDAQGS>

Monthly Active Users (MAUs).

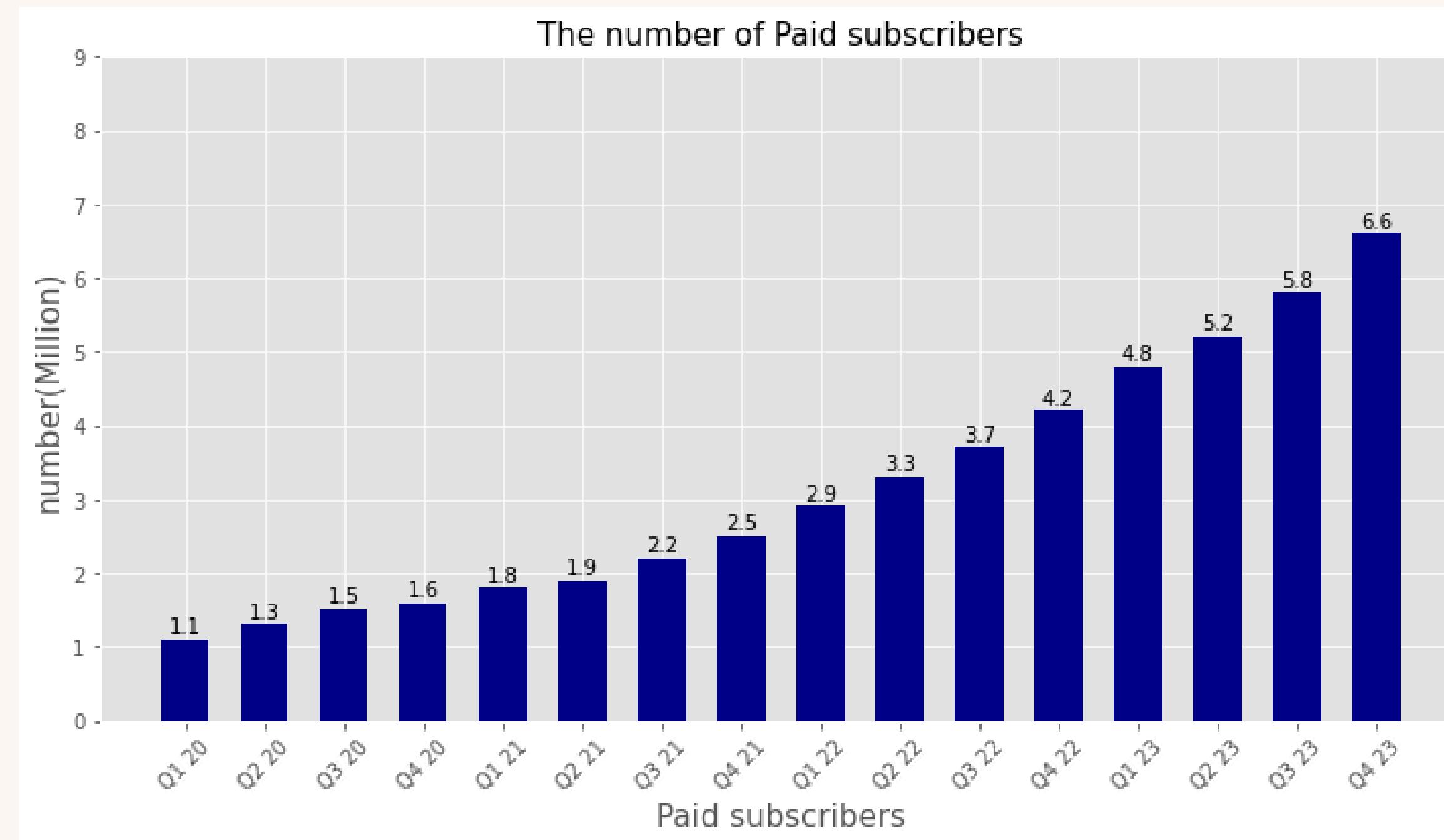
MAUs are defined as unique users who engage with our Duolingo App or the learning section of our website each month. MAUs are a measure of the size of our global active user community on Duolingo.



<https://icrm.indigotools.com/IR/IAC/?Ticker=DUOL&Exchange=NASDAQGS>

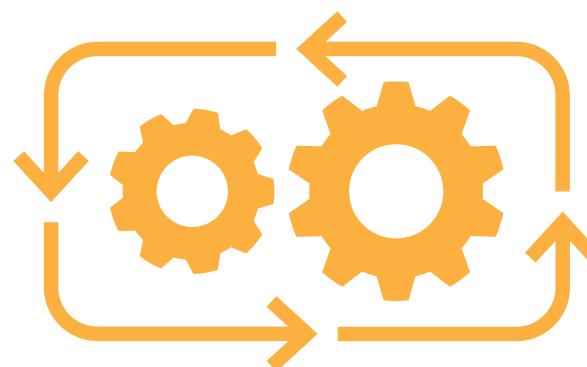
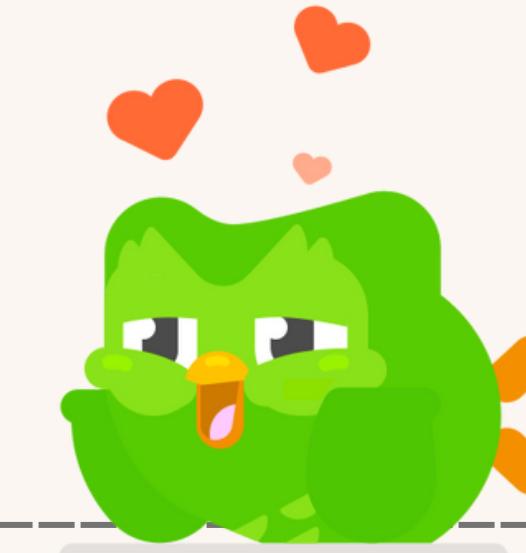
Paid Subscribers.

Paid subscribers are defined as users who pay for access to any Duolingo subscription offering and had an active subscription as of the end of the measurement period.



<https://icrm.indigotools.com/IR/IAC/?Ticker=DUOL&Exchange=NASDAQGS>

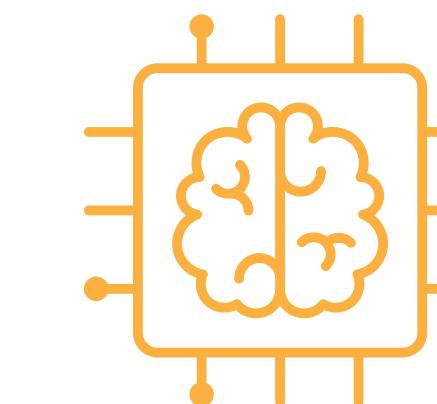
Conclusions



Product
Development



Product
Features



Technology and
Community



Revenue
Streams



Growth and
Retention

- ChatGPT
- Duolingo Blog (<https://blog.duolingo.com/>)
- Duolingo investor relations (<https://investors.duolingo.com>)
- User Experience with Duolingo Language Learning App(<https://vocus.cc/article/61f15287fd89780001458bfd>)
- How Did Duolingo Grow by 450%? Founder Luis von Ahn's Remarkable Journey and Focused Mission(<https://yujih.com/blog/how-duolingo-succeed/>)
- Duolingo's Mastermind: 37-Year-Old Professor Luis von Ahn, Inventor of CAPTCHA(<https://www.inside.com.tw/article/6137-luis-von-ahn-and-duolingo>)
- <https://icrm.indigotools.com/IR/IAC/?Ticker=DUOL&Exchange=NASDAQGS>

REFERENCES



www.duolingo.com

Thank you very much!

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everyone
can
duolingo



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