App status - looking at the metrics

The key metrics

We will use a series of key metrics in order to present the current status of our application

- Daily Active Users
- Daily Registrations
- Stickiness
- Activity level
- Retention and Survival function

How many users are there every day?

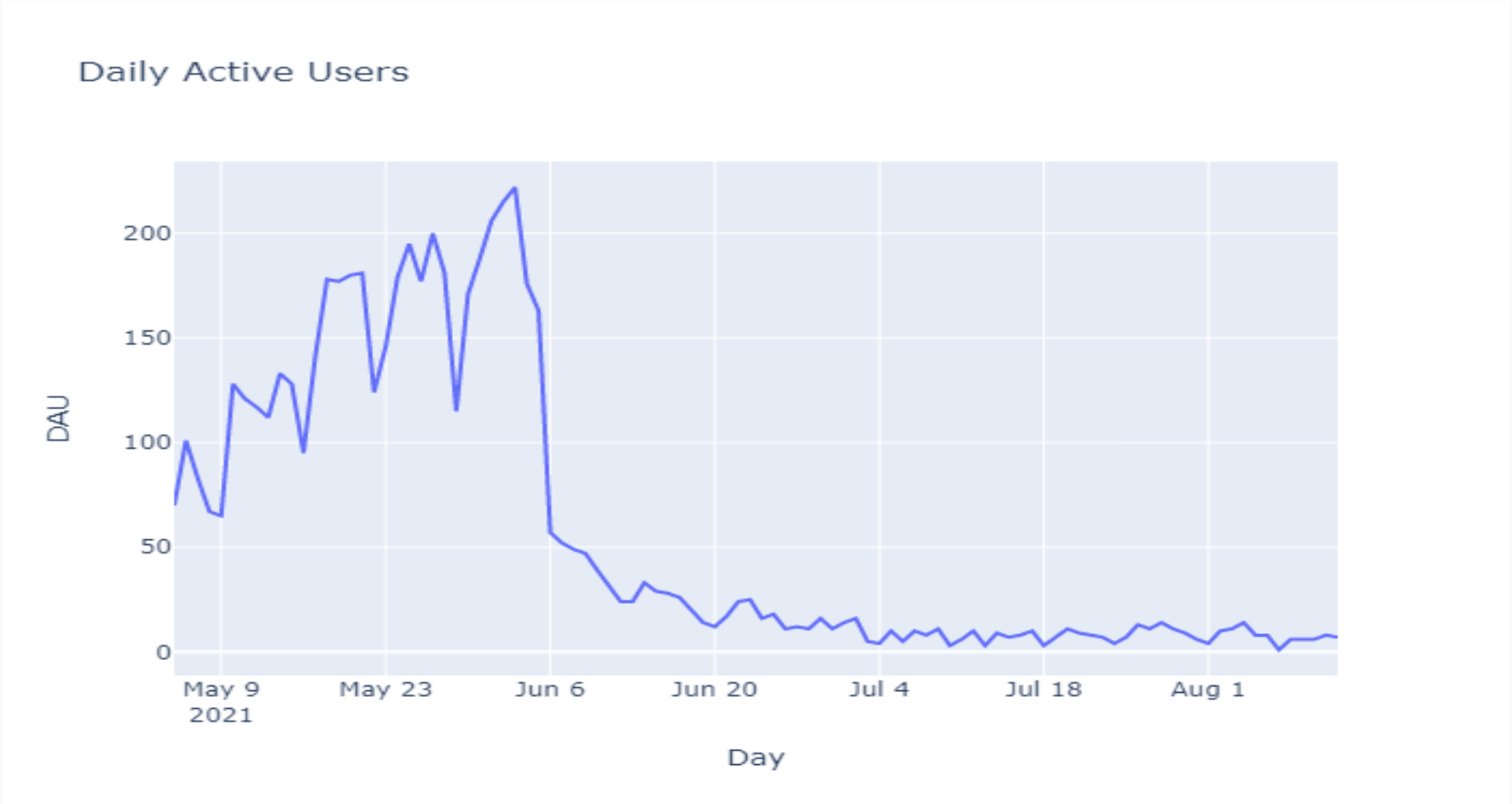

Figure 1: Things to note:

- 1-The users are increasing until the beginning of June. There is weekly variation, due to classes.
- 2-After the end of spring term, the app settles at a low level of users

How many registrations are there every day?

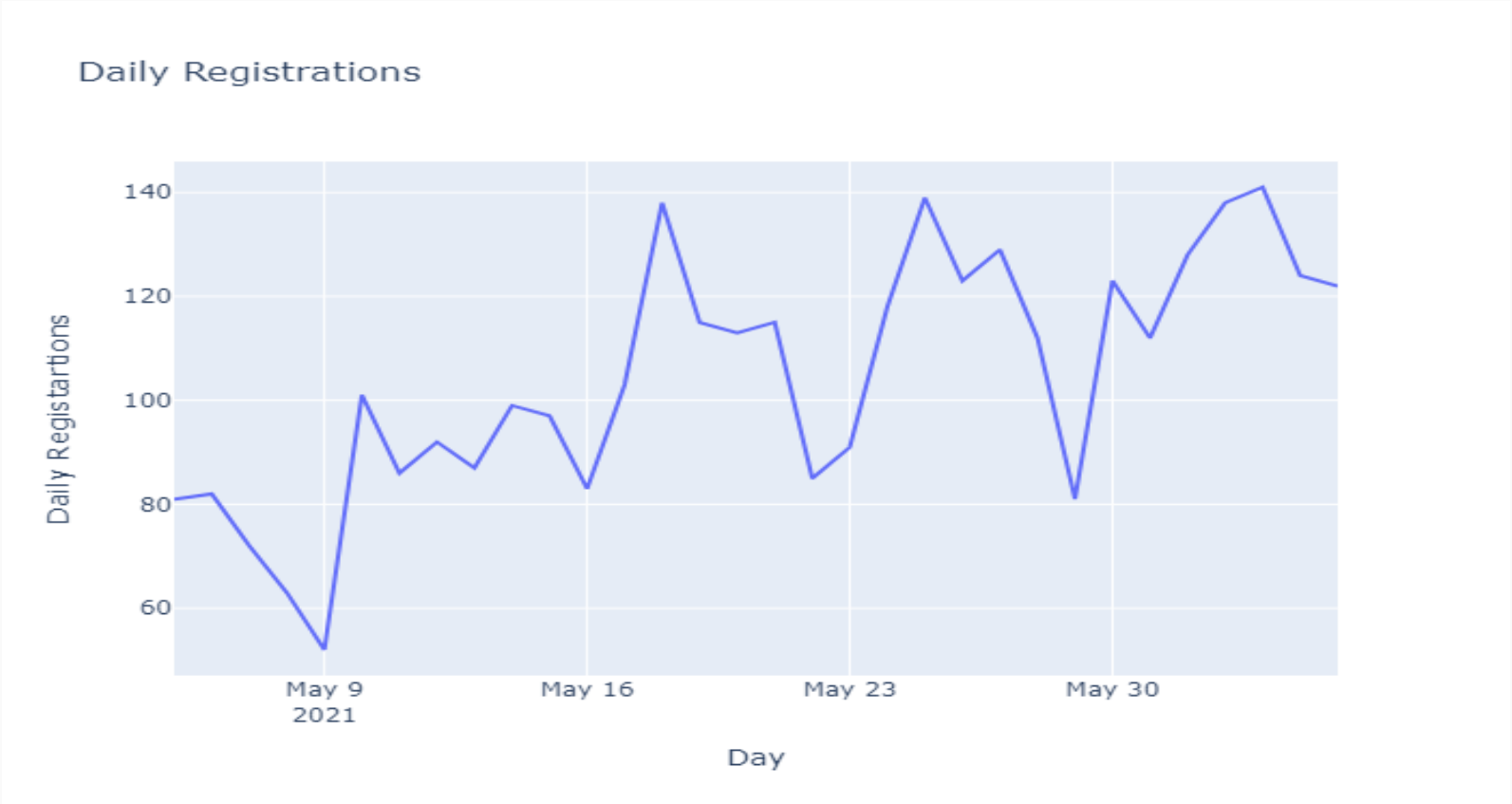

Figure 2: Things to note:

- 1-Registrations are increasing until the beginning of June, with the weekly variation.
- 2-There is a similar trend between registrations and daily users.

How likely are users return to the app?

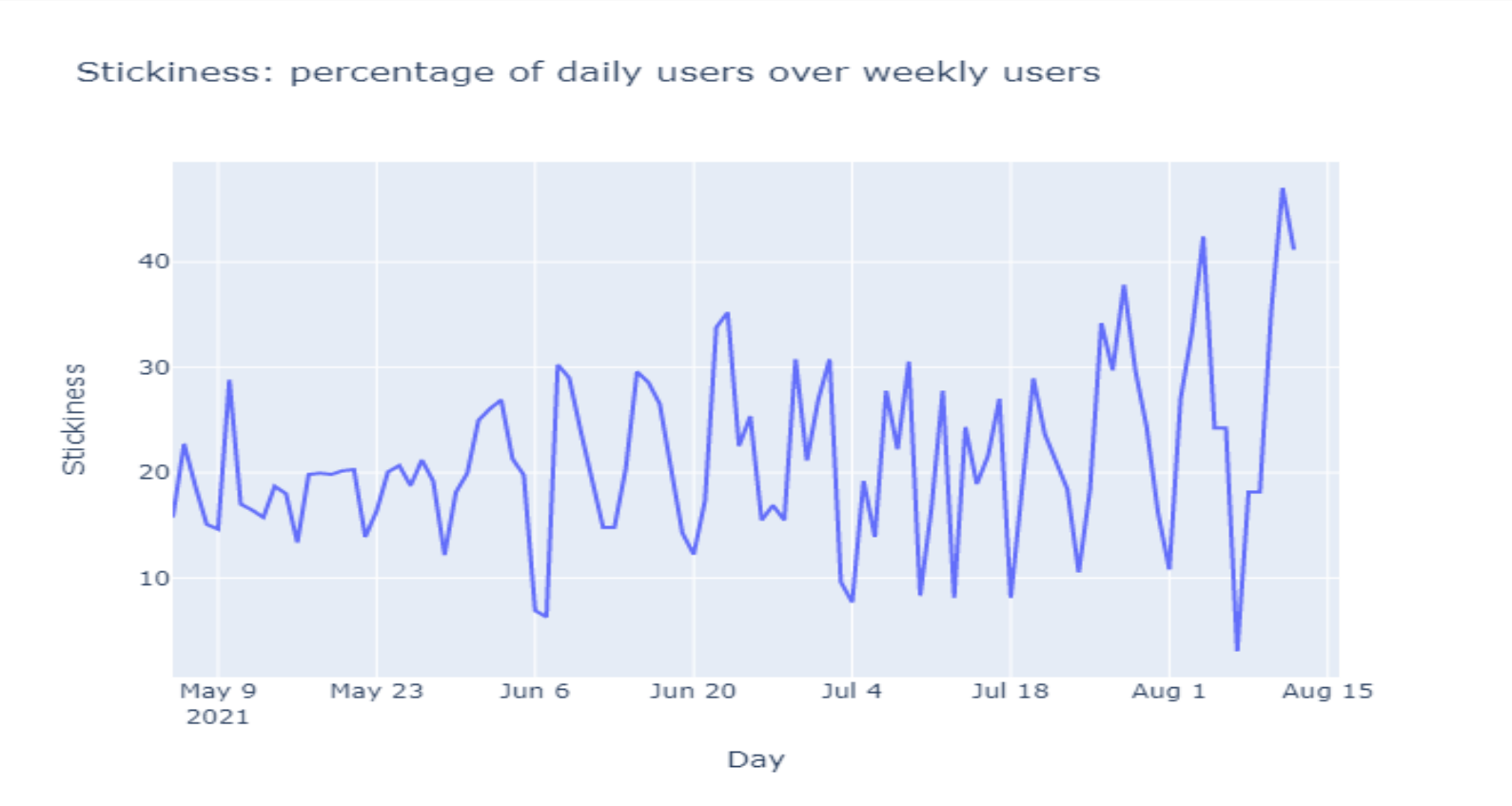

Figure 3: Things to note:

- 1-The trend seems stable around 20%, with increasing variance when user numbers are lower

How active are the daily users?

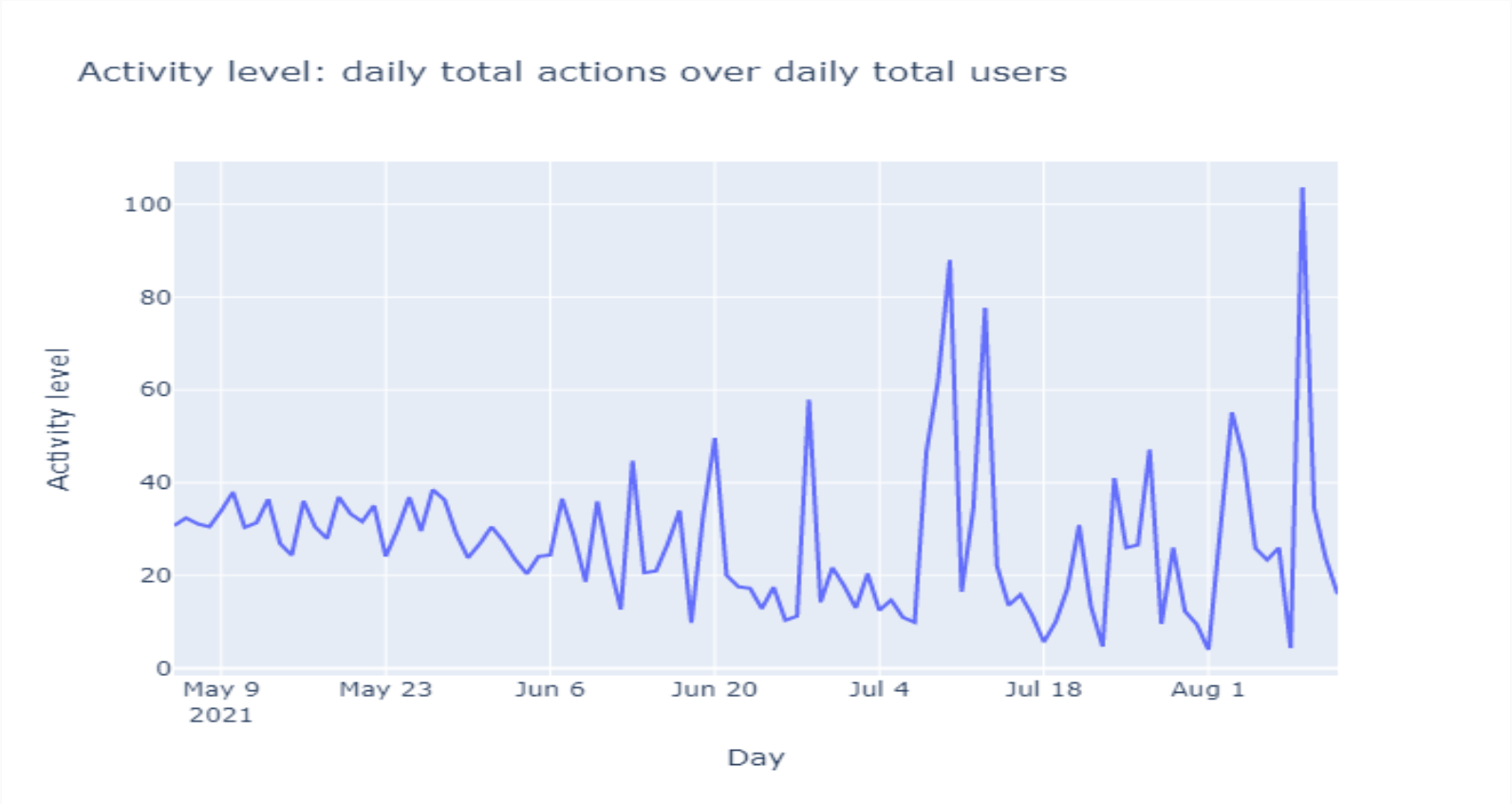

Figure 4: Things to note:

- 1-The activity level exhibits a downward trend after the beginning of June, with increasing variance when user numbers are lower

What is the probability a new user will be with us, tomorrow?

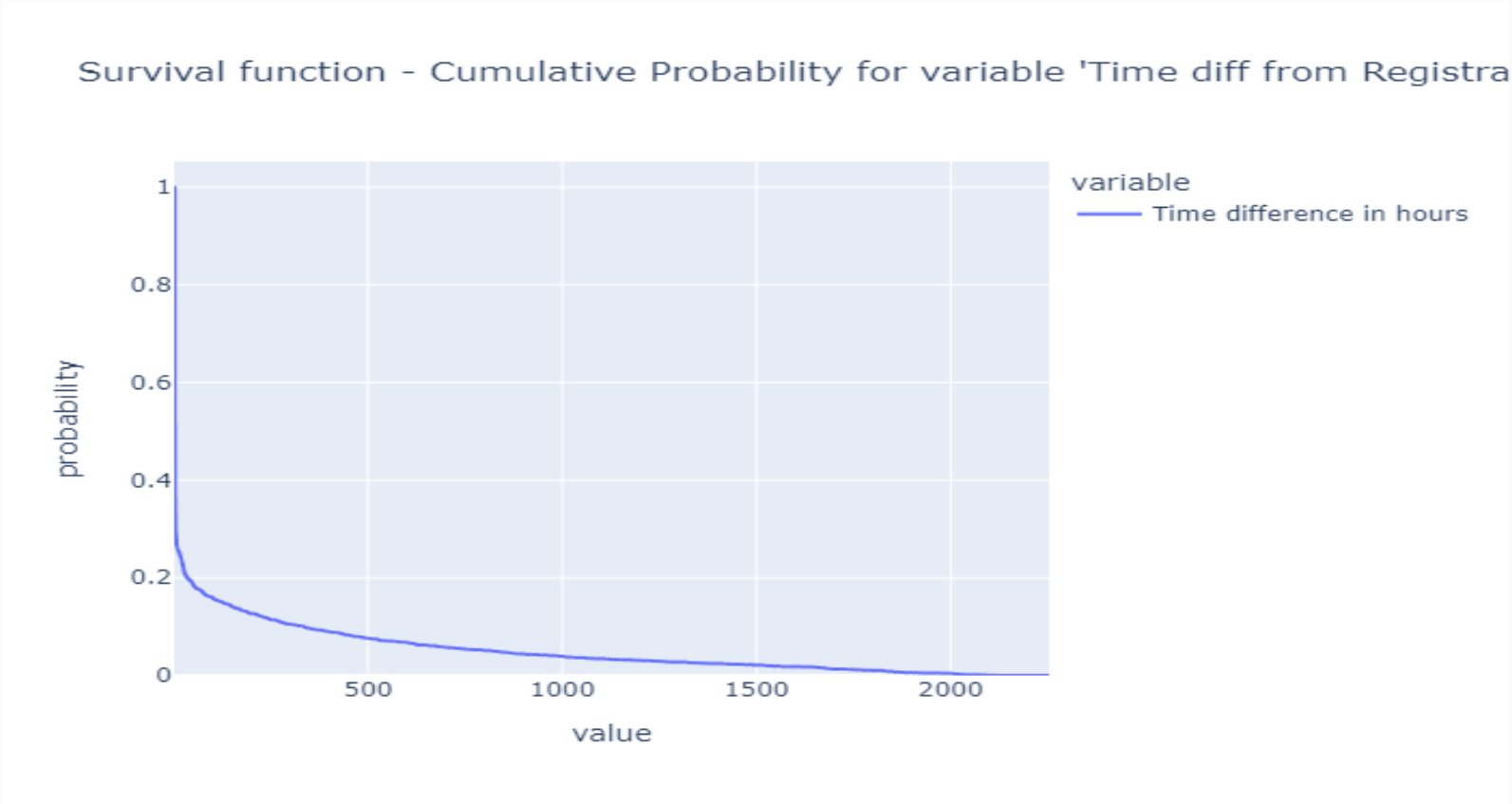

Figure 5: Things to note:

- 1-Around 80% of new users will stay with the app, at most, for a day. 60%, for 2 1/2 HOURS. Note that users do not perform actions for the first two hours. That leaves just half an hour of actual usage.

Main insights

- The level of usage of the app was driven by registrations.
- The retention is really low - we have computed a mere 8.5%
- The low usage levels over the last two months is not simply because of the summer vacation.

The 3 questions

Hogwarts SaaS

We were tasked with finding the answer to the following 3 questions:

- What Hogwarts school has the most active students
- Which student is the most active of all Hogwarts in terms of total time spent performing actions and total number of actions performed?
- Which student has spent the longest uninterrupted session?

In our analysis we started out with the last one because we were given a clear definition of "session", that allowed us to build upon for the other questions too.

We start with the last one.

Which student has spent the longest uninterrupted session?

The student with the longest uninterrupted session is 609712e1d65e4600a8d0c166 with a session that lasted for 154 minutes and 27 seconds.

Which student is the most active of all Hogwarts in terms of total time spent performing actions and total number of actions performed?

We defined total time spent through the sessions, from question 3, while for total actions we used two variations: one based on sessions and another on action counts. We finally combined the two metrics in a single one, using a weighted harmonic mean(with equal weights), similar to an F score using precision and recall. Both variation returned the same three user, albeit with different rankings.

The most active is:

- *user 60a3eca41ff78a00a9d34774, when using the metric based on sessions*
- *user 60ad23ce0ddefb00a870a9c7, when using the metric based on total actions*

What Hogwarts school has the most active students?

In a simple extension, we used the metric of total activity derived for question 2 , to gauge the level of activity at the level of schools.

We found out that Ravenclaw has the most active students.

Both metrics, previously derived, paint the same picture for all 4 houses.

Insights for stakeholders

How do the users engage with the application?

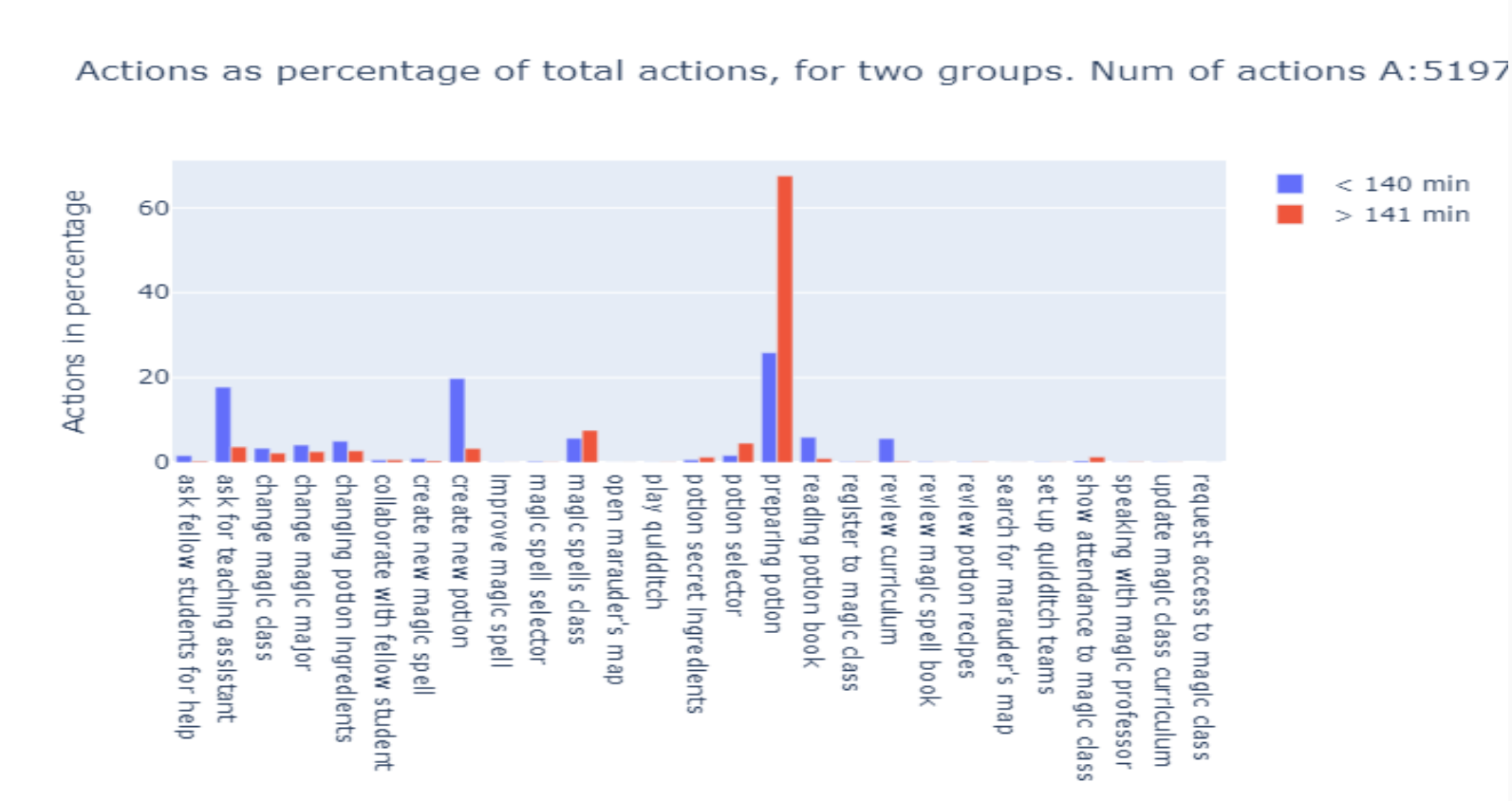

Figure 6: Things to note:

- 1-When users try out the app, they initially focus on a small subset out of the 29 possible actions.
- 2-Those that stick with the app, use an even lesser subset!

How smooth is the beginning of a user's journey?

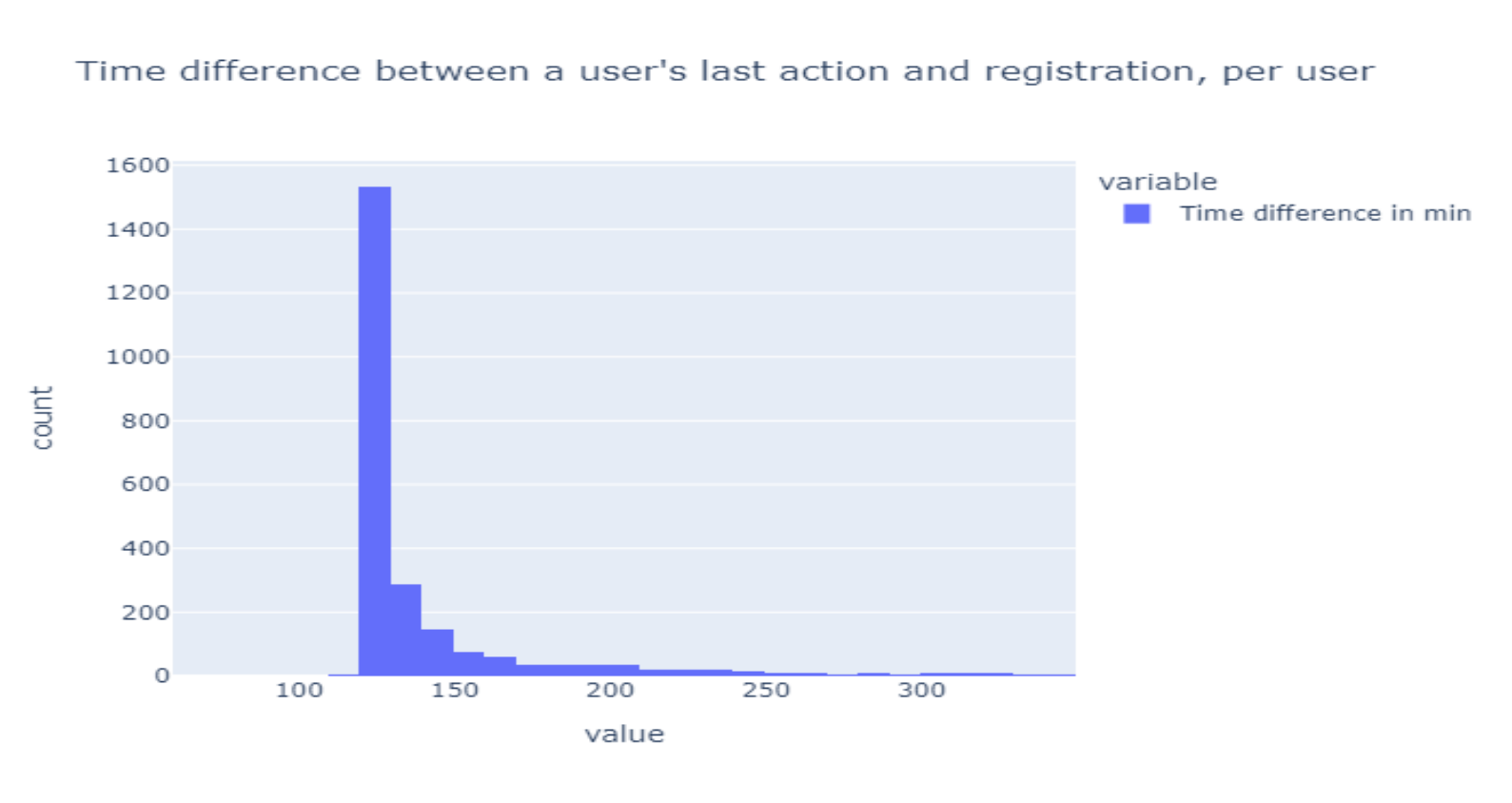

Figure 7: Things to note:

- 1-From the moment users register, there is a 2 hour period of inactivity.
- 2-For comparison, recall that 50% of the users will only use the app for 20 minutes.

Possible courses of action

Given the low retention rate and minimal period of engagement with the app for most users , and given the observations presented above, we could identify two possible courses of action:

- 1-The product team could revisit the offering of actions and the user journeys through which our users utilise this offering. The objective is make the app more appealing and engaging.
- 2-The dev/ops and data engineering teams could revisit the technical aspects of the user journey. Is the initial two hour gap justifiable by other (e.g. statutory) reasons? If not, then the reduction of initial waiting time could function in tandem with the efforts of the product team.

Technical Appendix

Data issues

We have identified a series of data issues that could have wider importance. You will find more detail in the relevant scripts

- There are users that have performed actions prior to registration!
- There are registered users with no actions at all.
- The field "action timestamp" from the actions.csv has 15% duplicate values , yet the entries have less precision (second) compared to the "account creation timestamp" (microseconds). Are these duplicate, or valid values?