

Human Computer Interaction

Phase 3 (Final Report)

Faculty of Engineering - University of Porto

Group 1

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1. Part I - User and Task Analysis

1.1. Project's idea

The idea for this project is the development of a user interface for both a mobile app and a web platform that has a focus on improving a FEUP student's daily life planning.

Calengineer aims to do so by promoting an accessible and easier way to present and organize a student's schedule, calendar and college events. It offers the possibility to swap classes in which one can find other students that are interested in swapping classes with them.

Beyond presenting a student's schedule and calendar it also provides the possibility to edit them and search for college's events organized in a calendar by theme and enroll into and out of them.

Caleengineer's idea came from the thought that currently some of the services offered by the college are not very intuitive nor easy to find and use.

1.2. Related apps, services and systems

Calengineer's idea takes inspiration in a few apps and services well known and used by the students such as Sigarra and the institutional Microsoft and Google account apps.

The three main features on this app would be: event organization on a calendar that could be filtered by themes, intuitive features for class exchanging and schedule planning.

Since one of Caleengineer's main goals is to promote ease of searching and discovering college events, it has similarities with Sigarra's Event, News, Calendar, Webmail pages, institutional email and calendars that are currently used for event sharing. There is no calendar filtered by theme.

In schedule planning, apps such as Google or Microsoft calendar and to-do lists and UNI are widely used by students to manage their schedules. Caleengineer aims to improve personalization and practicality for students.

Another important feature is the class exchange. Currently, it is done in a Google Forms made by the students. For class exchange, one must meet one of the following two requirements: switch classes to a class with fewer students or switch classes with another colleague from a different class. There's no platform for finding colleagues that want to switch classes so students must do it by themselves, talking personally to other students.

1.3. Questionnaire - Highlights

In order to understand the students' potential interest in an app as described above, a questionnaire was carried out. This questionnaire had seven questions that aimed to understand the problems that students currently find organizing their schedule during college, searching and keeping up with academic events information. Knowing this is a good indicator not only of the usefulness of the Caleengineer's app idea but also of what is currently worse and needs to be improved.

Fifty-five answers were collected. The large majority (96,3%) of those who answered are 18 to 24 years-old. Below are some points to highlight in the results of the questionnaire:

- **Difficult schedule's organization**

When asked about the difficulty found in planning their week, in a linear scale from 1 to 5 being 1 "No difficulty at all" and 5 "A lot of difficulty", only 14.5% of the students chose the answers 1 or 2 (no difficulty to little difficulty).

That leaves 85.5% of the responders choosing the options 3 to 5 (some difficulty to a lot of difficulty). In fact, more than half (50.9%) of the answers were in the options 4 to 5 which means that most people have trouble organizing their schedule.

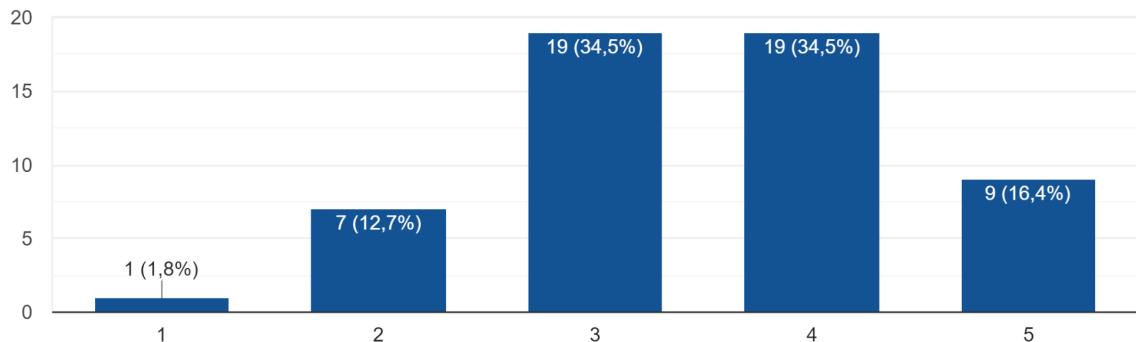


Figure 1. Answers to the question " How much difficulty do you feel planning your week during the semester?"

- **Overwhelming event divulgation strategy**

In a linear scale from 0 to 5 (being 0 “Not overwhelming at all” and 5 “Very overwhelming”), students were asked how overwhelmed they felt by the amount of emails publicizing events on their institutional email.

A significant percentage of the respondents (76.4%) chose the options 4 or 5 which means that they feel much or very much overwhelmed by that.

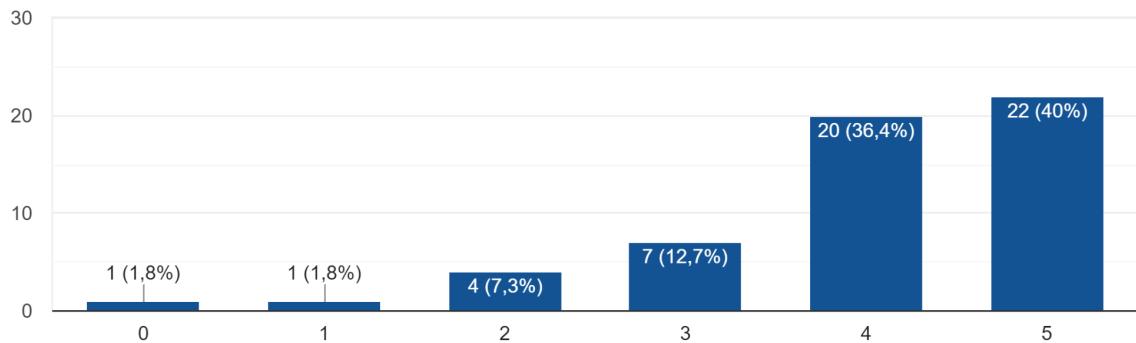


Figure 2. Answers to the question “On a scale of 0 to 5, how “overwhelming” do you feel is the amount of events publicized by institutional email?”

- **Missing events**

To the question “Have there been events that you would have liked to be a part of, but didn’t know they had existed until they had already taken place?” 87.3% of the interviewees answered in the affirmative. That could be related to the overwhelming feeling provoked by the current event divulgation method.

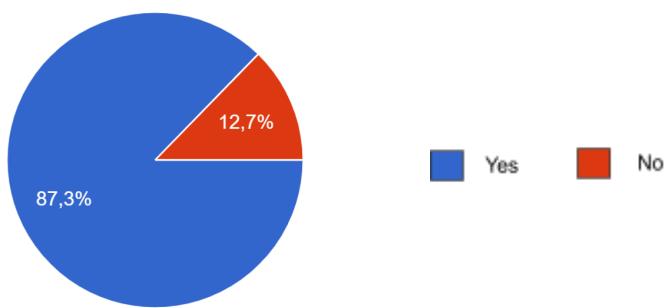


Figure 3. Answers to the question “Have there been events that you would have liked to be a part of, but didn’t know they had existed until they had already taken place?”

● Interest in some features

Analyzing the answers to the question about the potential interest in some features, the results were as follows:

- a lot of interest in a more accessible feature to exchange classes with other colleagues:
 - 50.9% of the respondents manifested being very interested and 25.4% quite interested;
 - only 3.6% of the answers expressed very little or little interest.
- strong support for the idea of a calendar with the college's events organized by theme:
 - 47.3% replied they are very interested and 27.3% that they are quite interested
 - merely 3.6% of the results pointed little interest;
 - no very little interest was addressed.
- diffuse opinions on a feature that would allow people to invite other colleagues to events:
 - 27.3% reveal a lot of interest and 25.4% are quite interested;
 - 27.3% indicate to be somewhat interested;
 - 20% have very little to little interest in such a feature.

Despite different opinions, more than half of the answers show quite a lot of interest in this tool (52.7%).

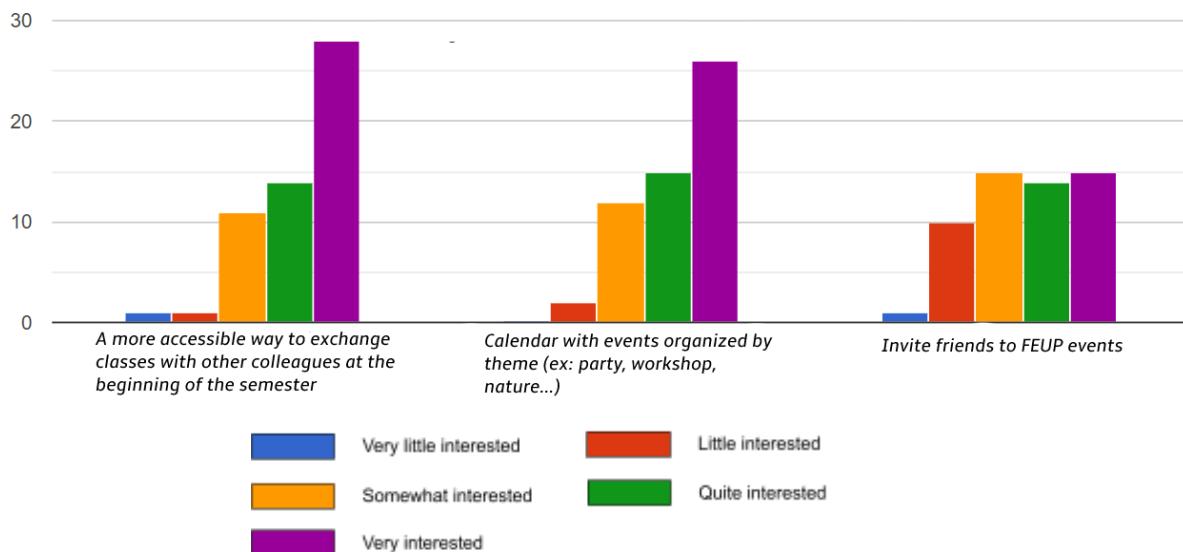


Figure 4. Question results to assess respondents' interest in three different features

1.4. Answers to 11 questions

Who will use the system?

The app will be used by students, namely those whose ages are between 18 and 24 years old.

What tasks are currently performed?

Currently, the information about events is both posted on social media, sent by email or posted on Sigarra's event, news or calendar pages.

The schedule can be seen both on Sigarra's schedule page or in UNI (an app made by students from NIAEFEUP) and the class is on Sigarra's class page.

If someone wants to change to another class they have to either go to a class with less students or find by themselves someone from a desired class that wants to switch classes, since there's no specific platform for that. Then, this class change process is carried out by a form where students have to fill the input box with very specific syntax and curricular unit codes, which is not something easily remembered.

What tasks are desired?

Desired tasks include a more intuitive tool to exchange classes, option to add other users as friends, a calendar with all the academic events that can be filtered by theme, a feature that allows users to invite friends to events, another feature to enroll into and out of events, the display of the planning of the week including the timetable and the possibility to customize the personal calendar.

How are tasks learned?

The app provides a help page in case the user has trouble understanding any of the features present.

Where are the tasks performed?

On a mobile device such as a cell phone or tablet via an app and website and on desktop or laptop via website.

What is the relation between the user and information?

A user has access to their own private customized calendar and timetable. In addition, anyone can access information about a public event or the timetables for any class.

What other instruments are available?

Caleengineer's idea doesn't depend on the usage of external instruments (like cameras, accelerometers, etc) to work at the moment.

How do users communicate with each other?

Users can search for each other by UP number or by name and then send friend requests. After becoming friends, they can send event recommendations to each other.

How often are tasks performed?

Tasks related to routine organization, like the calendar, timetable or anything related to events could be performed on a daily basis. However, tasks related to swapping classes should only be necessary twice a year (once per semester).

Are there time constraints?

Calengineer's use shouldn't normally take too long, since most tasks are just quick checks for information or searches, the app should facilitate this as much as possible. Some of the less frequent tasks, like swapping classes, don't require so much high speed from the app, as they won't affect the user on a daily basis.

What happens if something goes wrong?

In the case someone signs up for an event by accident or with a wrong understanding of what it is about, they can easily cancel it. The same can be said about adding friends in the app, which can be undone if needed. Also, if the user tries to switch to a class but it overlaps with other of their classes, then the switch will be discarded.

1.5. Personas

In accordance to the questionnaire made, two personas were created to represent different types of users that Calengineer aims to attract. The images can be found with better resolution in the Annexes.

The first persona is André:

NAME	TYPE
André Cardoso	Rational
	<h3>Background</h3> <p>Very intuitive. He believes that life becomes easier when you have a good academic life. He is not a student who achieves high grades, however, he is a hard working person. He has been stuck in confusing and bad schedules for his routine and has had bad experiences when trying to change them. Spends a lot of his day on public transport so he highly values his time</p>
<h3>Demographics</h3> <p>Male Portugal Single Student</p>	<h3>Quote</h3> <p>“<i>You will find a job, if you are willing to work.</i>”</p> <h3>Personality</h3> <ul style="list-style-type: none">DisorganizedSocialFriendlyStubborn
	<h3>Motivations</h3> <ul style="list-style-type: none">As he has a bad experience with class schedule placements, he is highly interested in exchanging classes with other students of his faculty.He would like to see opportunities earlier, so he can plan his schedule.
	<h3>Frustrations</h3> <ul style="list-style-type: none">As he has bad experiences with the schedules that are attributed to him, he might be frustrated.He spends a good part of his day in public transportation.

The second persona is Sofia:

NAME	TYPE
Sofia Lourenço	Idealist
	Background <p>She is an extroverted person and really enjoys participating in group activities, especially when outdoors or with friends. She's hyperactive and always wants to be doing something new and interesting, so she doesn't feel like she's wasting her time. She's not the most responsible student, especially because she has some trouble focusing and she doesn't spend too much time studying.</p>
Demographics <p>Female 21 years Portugal Single Student</p>	Quote <p><i>"Always do your best to make every minute count."</i></p> Personality <ul style="list-style-type: none">SocialOpen mindedOutdoorsyScatterbrained
	Motivations <ul style="list-style-type: none">As she is scatterbrained, she would like to have all the information about events in one place.As she is a very social person she always wants an excuse to bond with friends and meet new ones. Frustrations <ul style="list-style-type: none">As she sometimes loses parties that she didn't even know existed, so she gets frustrated.Sometimes she feels like she isn't learning as much as she should about her future career.

1.6. Activity scenarios

1st Activity

André just received his timetable for the new semester. Unfortunately, he was put in class 6 for Linear Algebra, which means his practical lesson only ends at 7 p.m. on Thursday. This was very inconvenient for him, since he needs at least 2 hours on public transports to get home and he still has to cook dinner, leaving his routine a mess. But then he remembered to use the Calengineer app! With it, he discovered that class 3 has the same lesson at 9:30 a.m on Friday, a time when he's free, and luckily, he was able to find a student from that class who wanted to swap with him. Now he comes home early and can always have dinner at 8 p.m.

2nd Activity

Sofia is going on Erasmus next semester. She's excited, but also a bit sad to not be able to see her friends and colleagues for such a long period of time. To make up for this, she decides to make as many memories as possible with her FEUP friends this semester. The only problem is that she has no idea where to make those memories. She decides to use the Calengineer app. This way, she finds some parties that can fit into her busy schedule and is able to not only bond with friends, but also meet even more people.

Furthermore, she was only planning to use the app for discovering parties, but she found herself attending some special lectures and workshops that she never even knew existed. This was all because she received a recommendation to attend them from a friend via the app. Sofia ended up having her most fun semester yet, but also the one when she learned the most about her future career.

1.7. Simplified conceptual model

Objects (attributes):

- user (upNumber, name, calendar, timetable)
- lesson(subject, class, weekday, time, duration, room, professor)
- exam(subject, date, time, duration, room)
- event(name, description, date, time, duration, location)

Actions:

- insert, remove elements from timetable and calendar
- sign up, cancel, search, recommend event
- search, swap lessons from other classes

Relations:

- user can be friends with other users
- user's calendar has several exams and events
- user's timetable copies elements from user's calendar, also has lessons

1.8. Functionalities and tasks

Functionalities

These are the main functionalities of the app:

- See the dates of an exam in the calendar
- Fully customize your weekly timetable
- Receive/Give an event recommendation
- Discover new events
- Sign up for an event
- Add a friend
- Swap a class with another student
- See the timetables of other classes

Tasks

These are 3 examples of more specific tasks that can be performed in the app:

- Check when the closest exam is
- Find what event has the most recommendations from your friends this week
- Search for people who have a specific subject on a different day than you and also want to swap.

1.9. Usability requirements

In terms of **efficacy**, when checking details about the calendar or timetable all users completed the task, 90% made no errors, the other 10 % made 1 or 2 errors. For checking event information, the numbers were quite similar: all users completed the task, 90% made no errors, the other 10% made 2 to 4 errors. When trying to use the class exchange feature, 95% of the users completed the task, 80% made no errors and the other 20% made no more than 5 errors.

When it comes to **efficiency**, we expect that checking any information about the timetable or calendar shouldn't take more than 20 seconds, and at most 5 clicks. For checking event information, the user shouldn't take more than 45 seconds and 8 clicks. For activities like the customization of timetables, signing up for events, or swapping classes, time can't be easily estimated, but should be as little as possible.

In terms of **satisfaction**, it would be ideal that less than 10% of Calengineer's users feel unsatisfied.

1.10. Conclusions

This phase of the project was crucial for determining what should be our priorities in terms of features, but also which target audiences we should aim to appeal to and understand their problems and most importantly, how we could help them.

According to the results of the questionnaire carried out, it seems that there's a lot of adhesion for Caleengineer's app idea namely for the class exchange feature and for the calendar with all the academic events organized by theme. This gives us confidence that this project will advance in the right path and become quite useful to many people by helping them make the most of their semester.

1.11. Annexes

Questionnaire “Organizador de Eventos”:

https://docs.google.com/forms/d/e/1FAIpQLScj1_CbgjiZoLCEeFmA4W8q8unPUmysqlEgIx6MfbsWDdwIg/viewform?usp=sharing

Persona Sofia - better quality image:

<https://cdn.discordapp.com/attachments/1021423009854140450/1031178275692761097/unknown.png>

Persona André - better quality image:

<https://cdn.discordapp.com/attachments/1021423009854140450/1031178334111006810/unknown.png>

2. Part II - First Prototype and Heuristic Evaluation

2.1. Project's Abridged Description

Calengineer is a mobile application whose main goals are to provide both an easier way to access information about events taking place in the academic environment and to organize a student calendar and schedule.

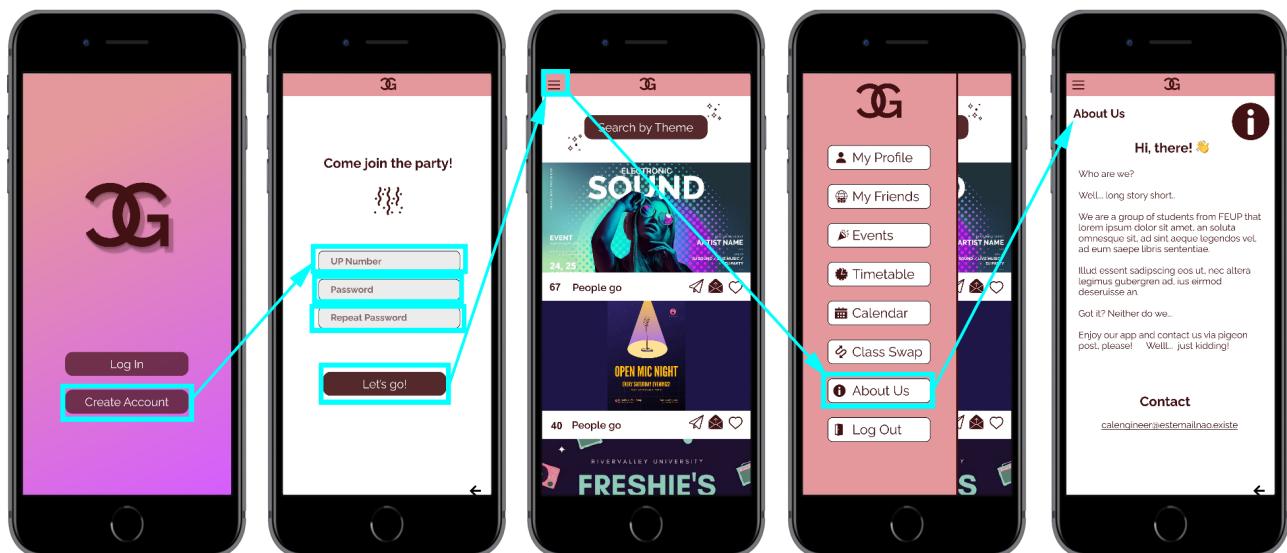
2.1.1. Functionalities

- a. Log in and out of the account
- b. Create account
- c. Discover new events
- d. Scroll through relevant events
- e. Search events by category
- f. Add events to favorite
- g. Sort events by date or relevance
- h. Receive event recommendations from friends
- i. Give event recommendations to friends (to be implemented)
- j. Add event to calendar
- k. Go to the event tickets page (to be implemented)
- l. Check event specific's page
- m. Search for users
- n. Add users as friends
- o. Message friends
- p. Accept and decline friend requests
- q. View friend list
- r. Remove friends
- s. Apply to exchange classes
- t. Access weekly schedule
- u. Access calendar
- v. Check events happening on a specific date on calendar
- w. Remove and add events to calendar
- x. Change password
- y. Recover password
- z. Delete account
- aa. See "About Us" page

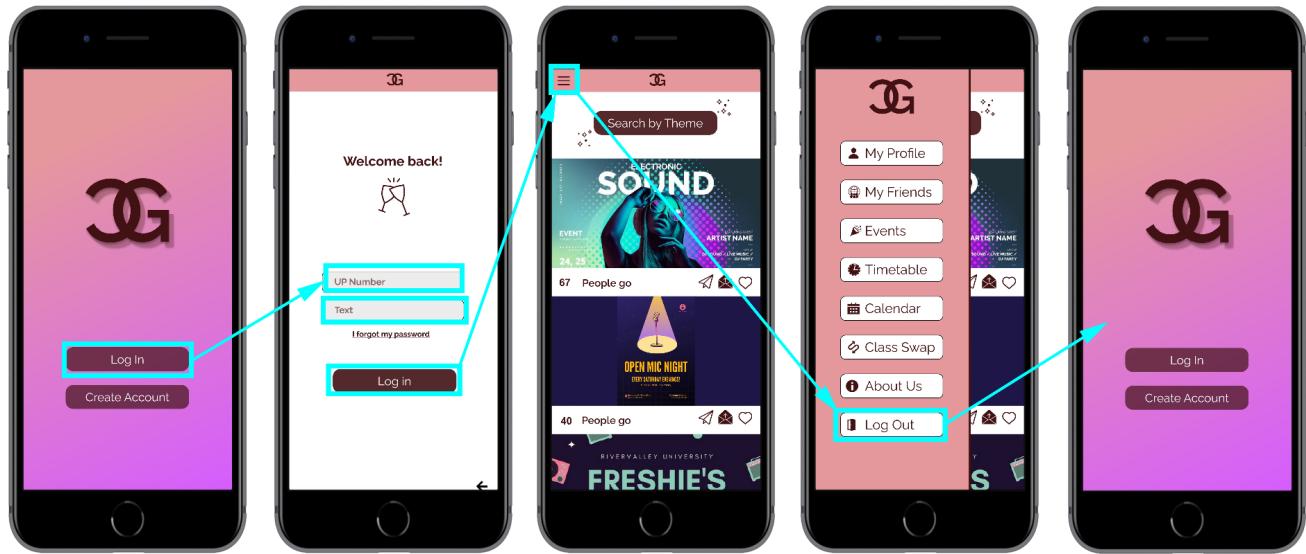
2.1.2. Tasks

- a. Check the schedule for a specific day of the week;
- b. See which events are planned for a specific day of a month;
- c. Add a workshop to my week schedule;
- d. Invite a friend to a party;
- e. Change my password to a safer one;
- f. Remove a canceled meeting from the schedule;
- g. Log in and log out ;
- h. Create an account;
- i. Read the About Us page to contact the staff team;
- j. Apply to exchange classes;
- k. Recover a forgotten password;
- l. Search events by a desider theme and sort them by relevance;
- m. Delete account;
- n. Receive invites to events from friends;
- o. Adding and removing friends to the friendship list.

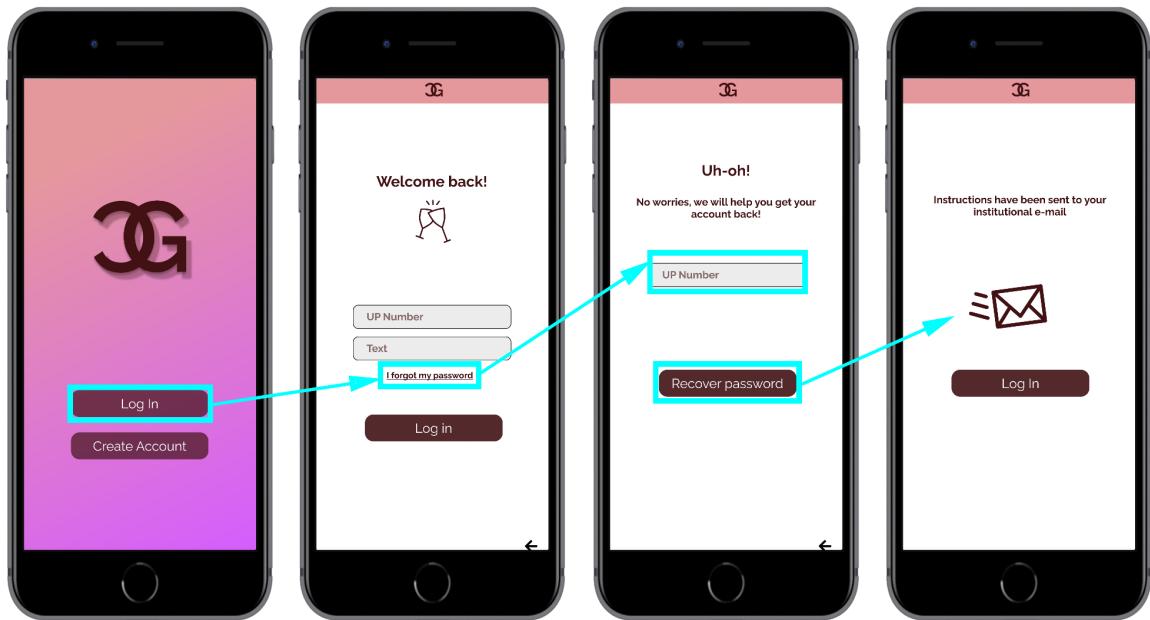
2.2. Prototype Wireflow



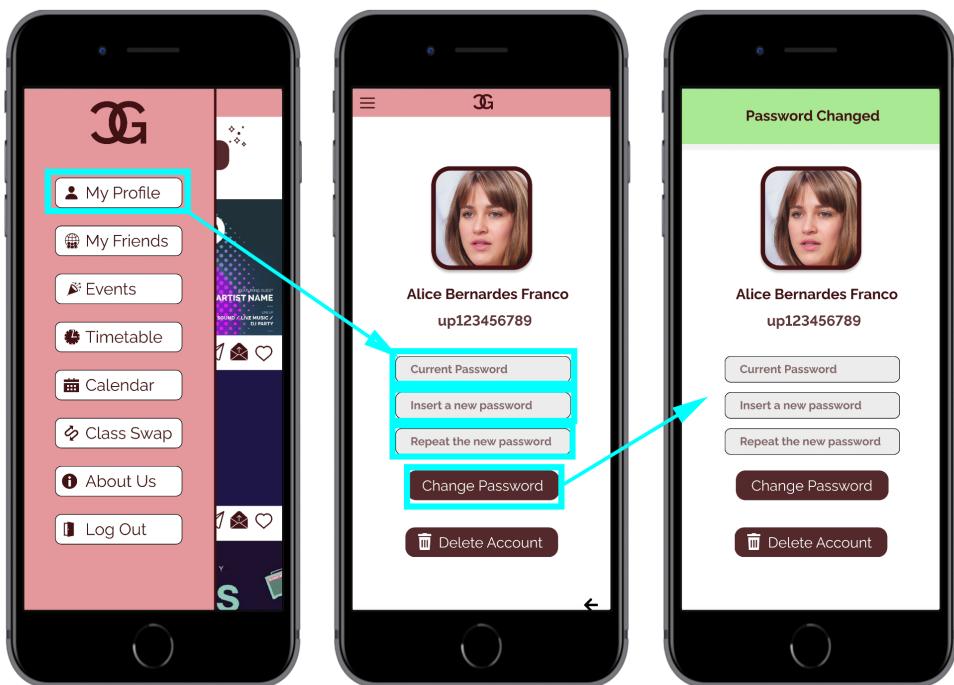
Wireflow 1. Create an account and read the “About Us” page to understand the app.



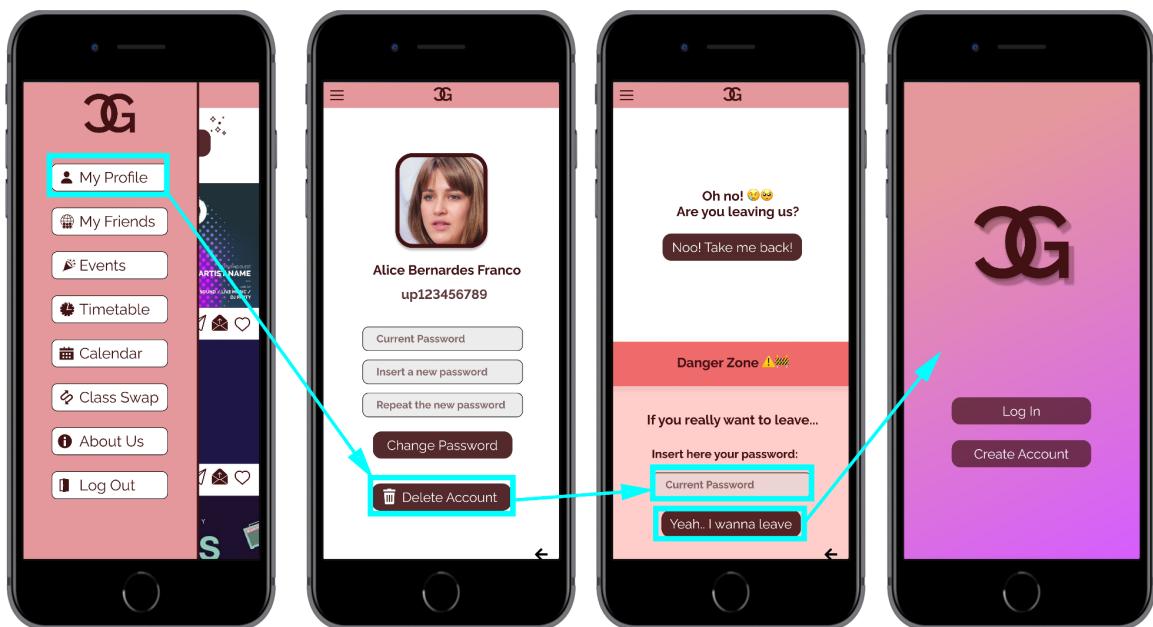
Wireflow 2. Log-in and log-out of the app.



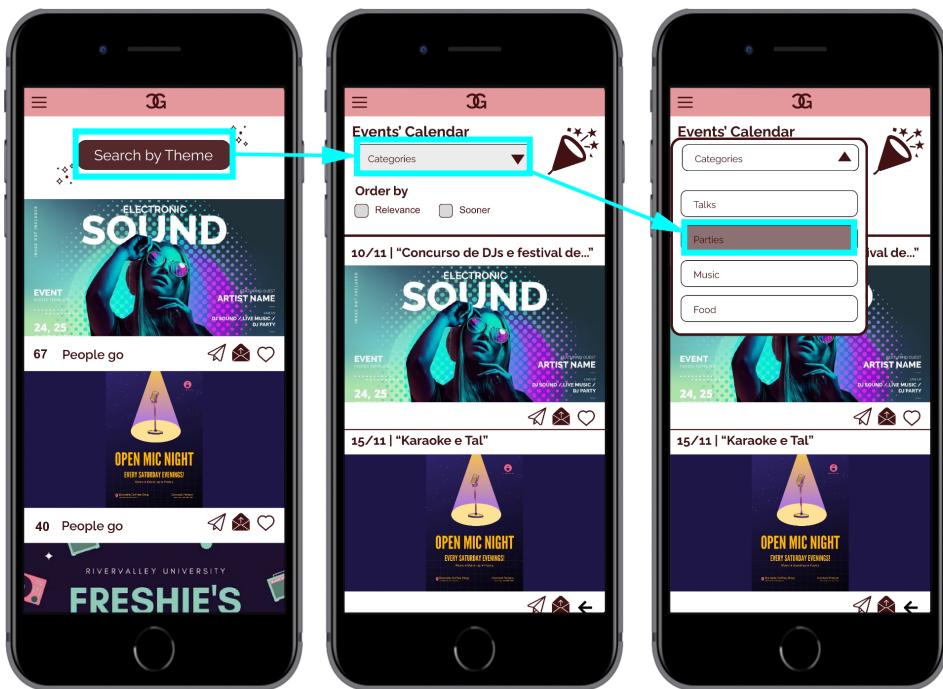
Wireflow 3. Recover password after forgetting it.



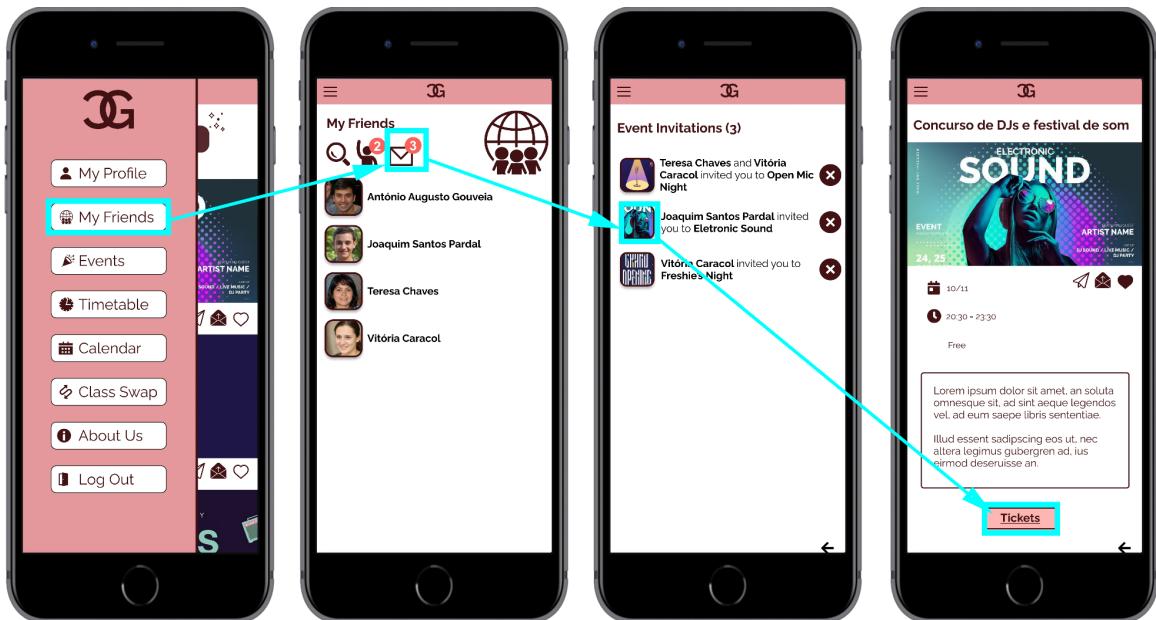
Wireflow 4. Change password to a safer one.



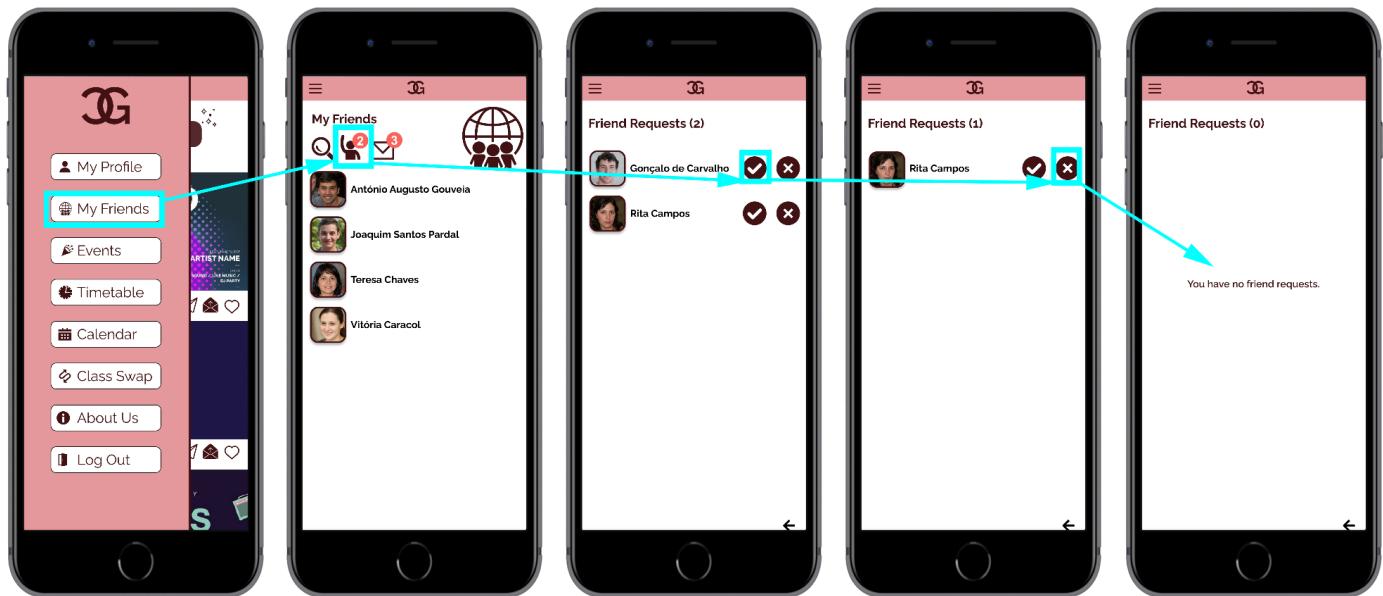
Wireflow 5. Delete account.



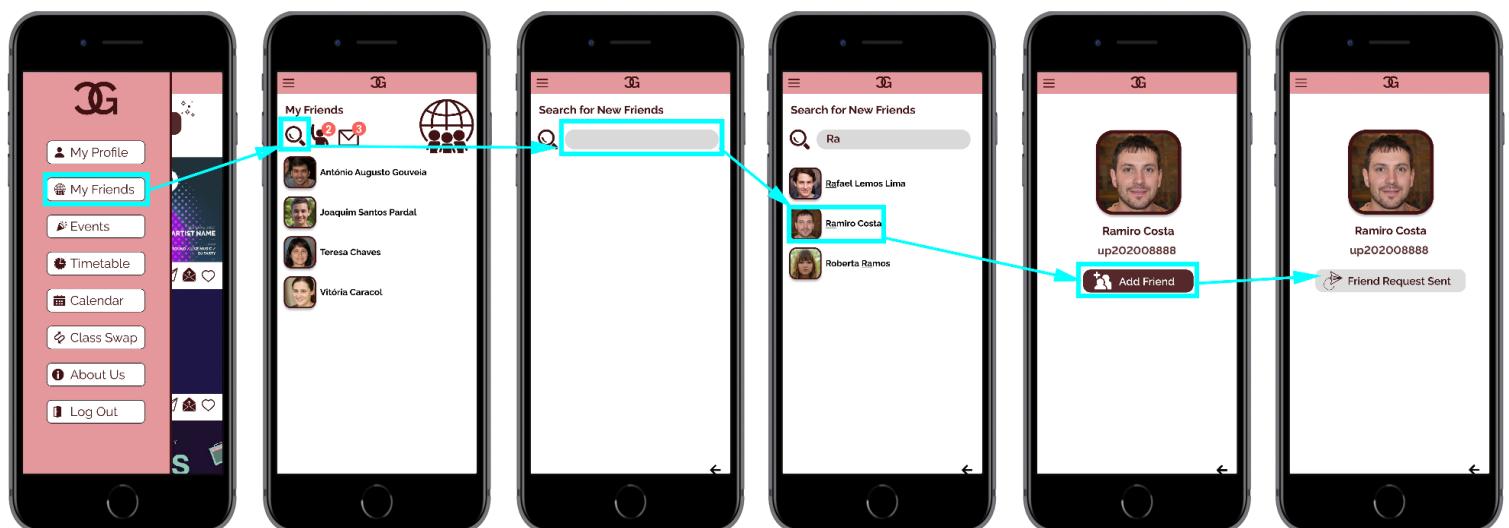
Wireflow 6. Select events by the “Parties” filter.



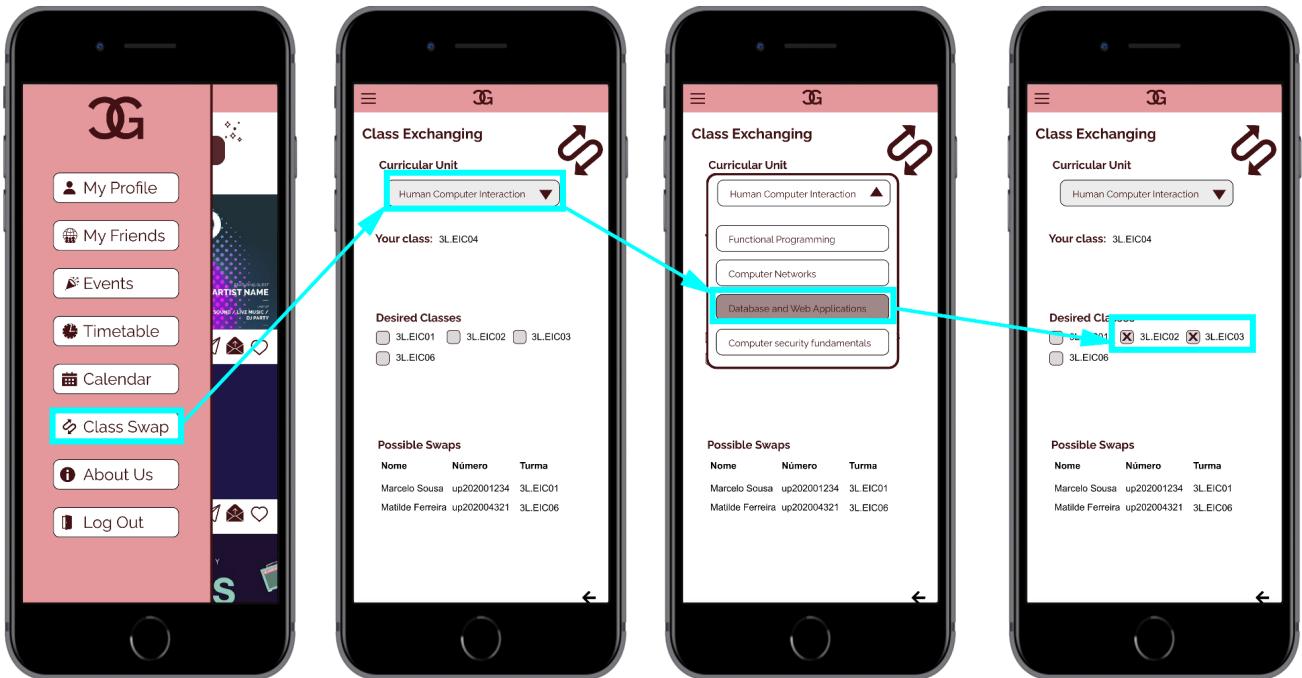
Wireflow 7. Receive an event recommendation from a friend and sign up for it.



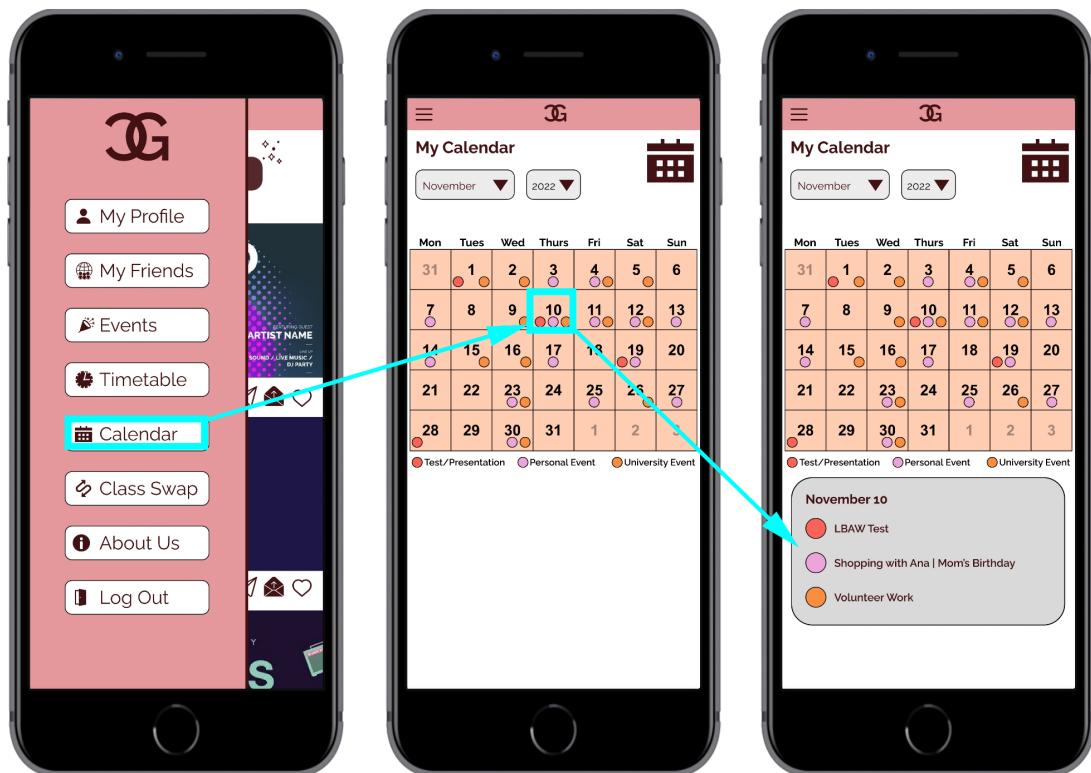
Wireflow 8. See friend requests and accept or decline them.



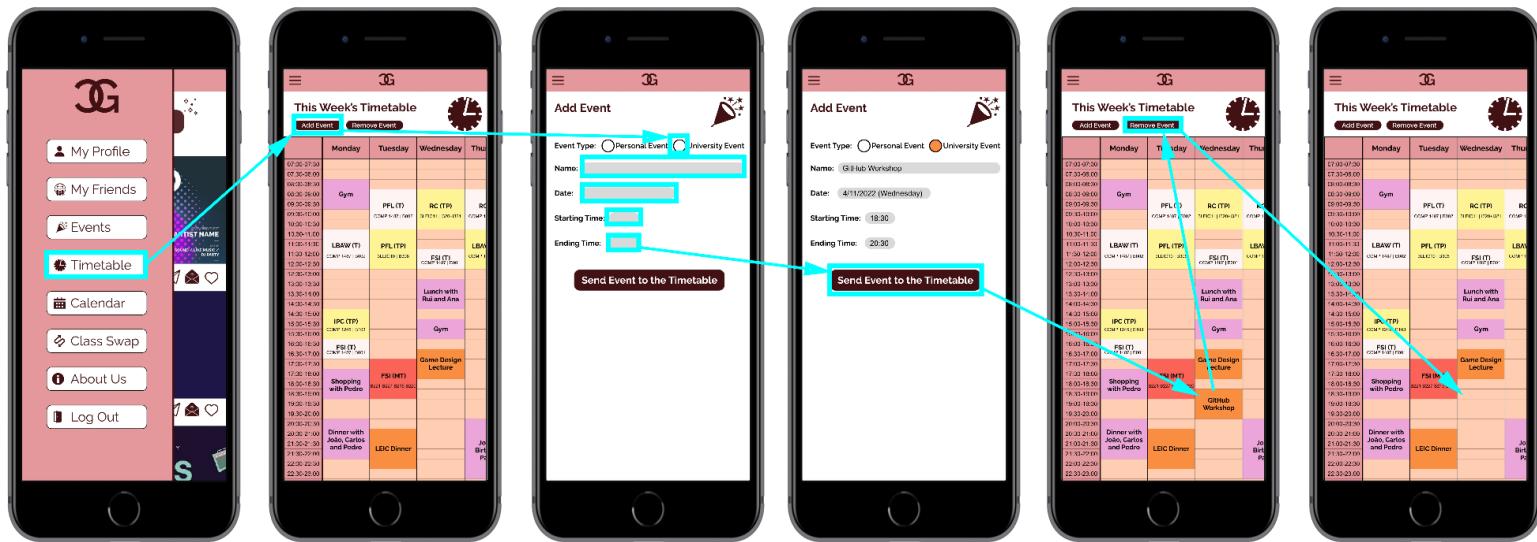
Wireflow 9. Search for a user and add them as a friend.



Wireflow 10. Apply to exchange classes for a specific subject.



Wireflow 11. Check a day's events on a calendar.



Wireflow 12. Add and remove an event from the timetable.

2.3. Heuristic Evaluation Results

This prototype was evaluated by group 2 and 7.

Our biggest complaints were from group 2 in regard to the match between system and real world (heuristic 2) with an average severity of 3. This was because there were issues with the clarity of some elements. For example, they assumed clicking on the top icon of the app would send them to the home page, which it didn't. But the worst part was the calendar, which got users confused because they didn't find its customization very clear.

Furthermore in group 2's review, in terms of consistency and standards (heuristic 4), we were called out on some uses of icons for the event page that weren't very clear about their purpose, nor were they visually consistent in their display. The main problem here was confusing the button to register for an event with the button to recommend that event to a friend. These problems were given an average severity of 2.

Finally, they also pointed out that, in terms of aesthetic and minimalist design (heuristic 8), the colors we used for calendars and timetables could give people with color blindness a hard time, this had an average severity of 2.

For group 7, the only complaint presented was for consistency and standards (heuristic 4), by pointing out that after logging in, a loading screen was used, but this didn't happen after registering for the first time, with a severity of 2.

2.4. Corrections to Perform in Phase 3

Thankfully, most of the criticized aspects of our prototype can be easily fixed. The problems with the calendar's colors (heuristic 8) can be solved with a simple color swap and the confusing icons (heuristic 4) can be substituted. The “missing loading screen” problem can also be quickly fixed, since it was just a small oversight..

For our biggest complaints in heuristic 2, the “home page button confusion” can be also easily fixed by making it do what users assumed in the first place. The one that will take a bit more work is the problem with the clarity of the calendar customization, which will have to be significantly reworked, but this will undoubtedly be fixed since it was the biggest complaint presented.

2.5. Conclusion

This phase of the project has great importance to understand any weaknesses in the application prototype that must be changed so that the application usage will be more intuitive, accessible and pleasant for the end user.

Important information was obtained that will help the improvement of this work. The changes suggested will be applied soon as well as the ones suggested by the practical classes professor (assembling the schedule page with the calendar one and being more consistent in terms of the appearances of the icons for different purposes (filled to information and outlined to buttons)). Other features that are still missing will also be implemented.

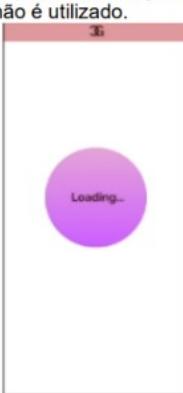
It's essential to have feedback before starting the application to make sure that it has a good usability and to reduce ambiguities, facilitating its progress.

2.6. Annexes

- [Figma](#)
- [Heuristic Evaluation Report from Group 2](#)
- Heuristic Evaluation Report from Group 7:

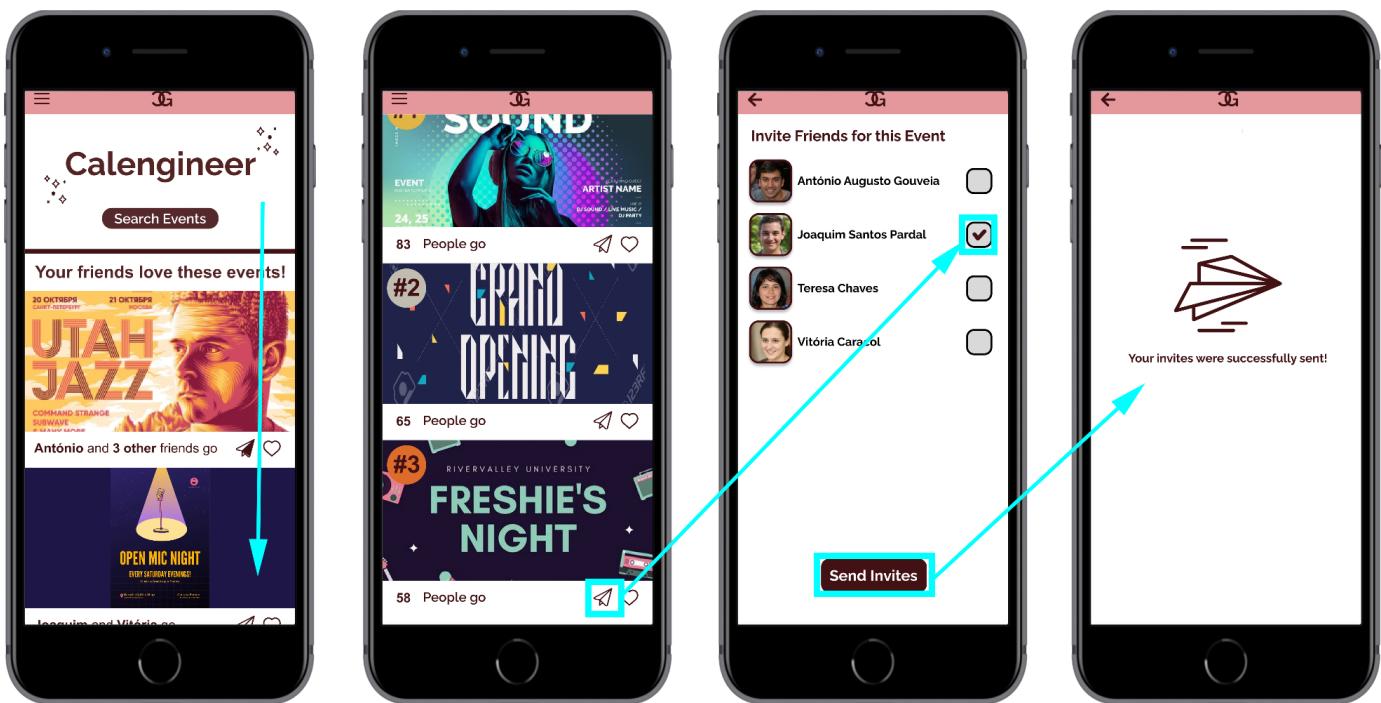
Heuristic Evaluation Report

Group evaluated: Group 1- CG
Evaluated by group: Group 7

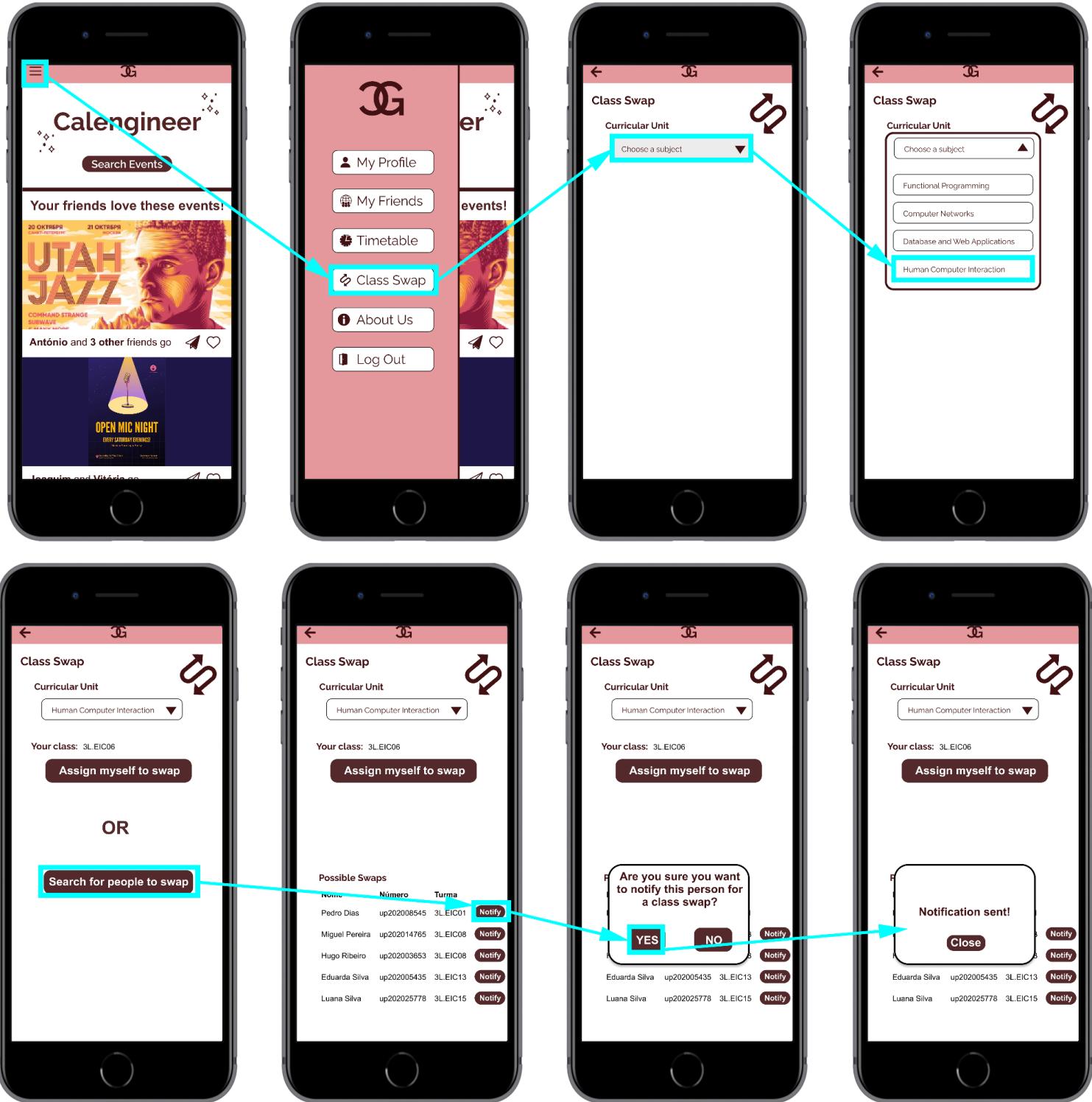
Problem #	Issue (include screenshot)	Heuristic(s)	Severity (1-4)
1	Após o inicio de sessão aparece um ecrã de loading porém quando há criação de conta esse mesmo ecrã não é utilizado. 	4	2

3. Part III - Second Prototype and User Evaluation

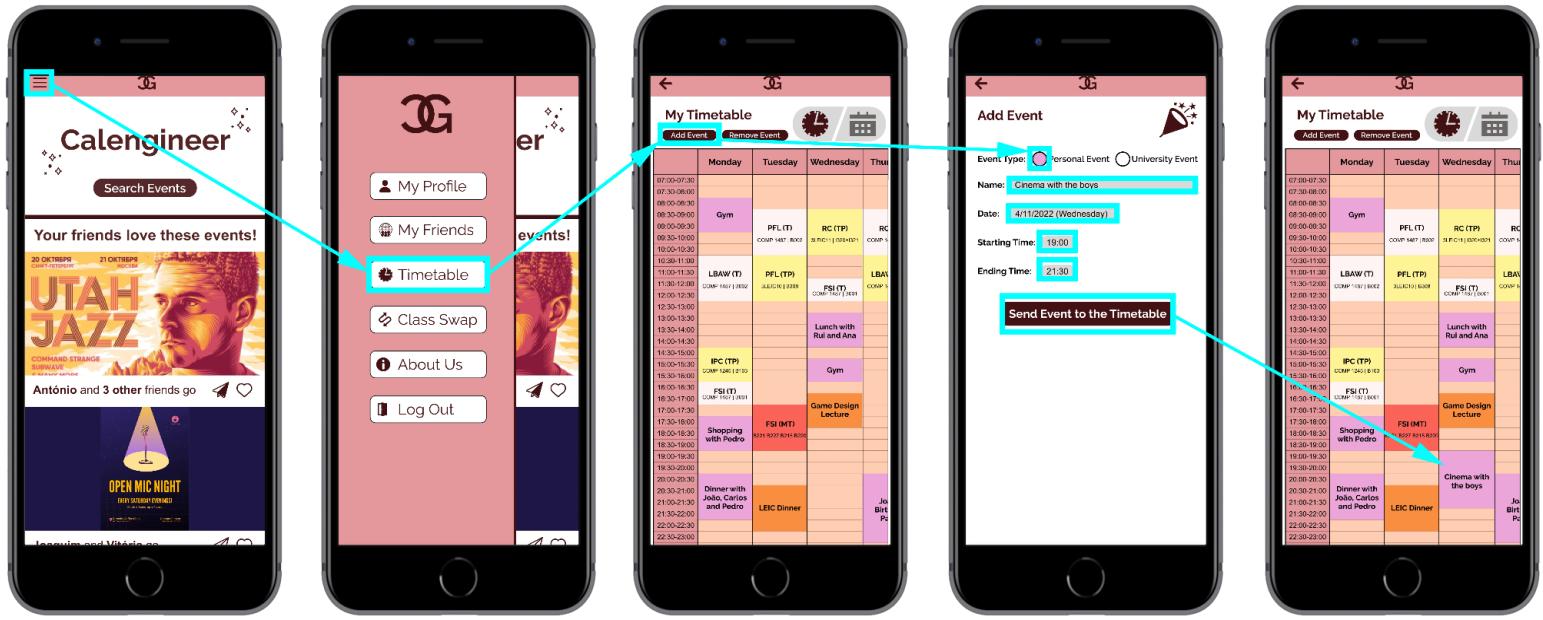
3.1. Prototype's Wireflow



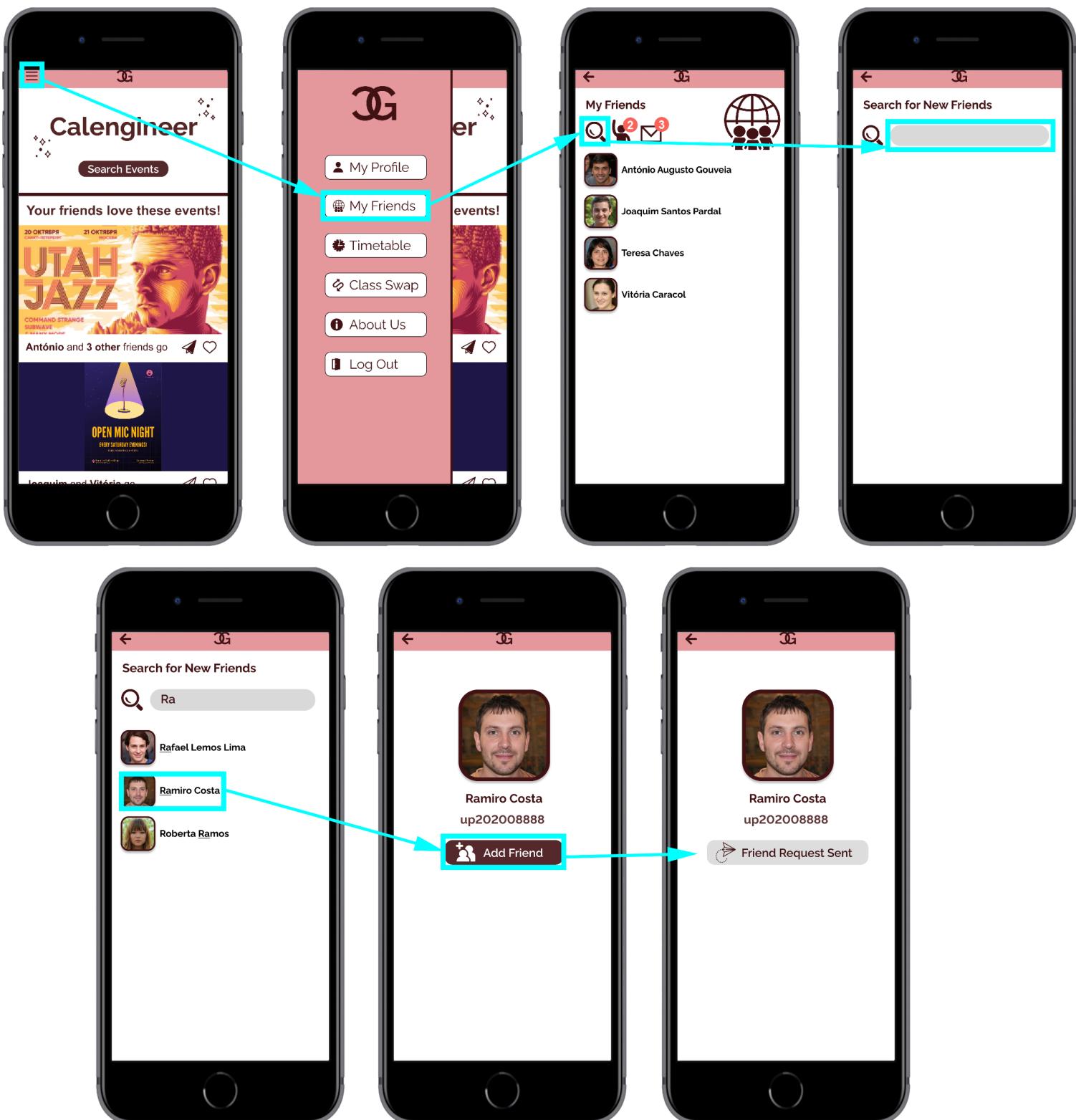
Wireflow for Task 1: Recommend the 3rd most popular event of the week to your friend Joaquim



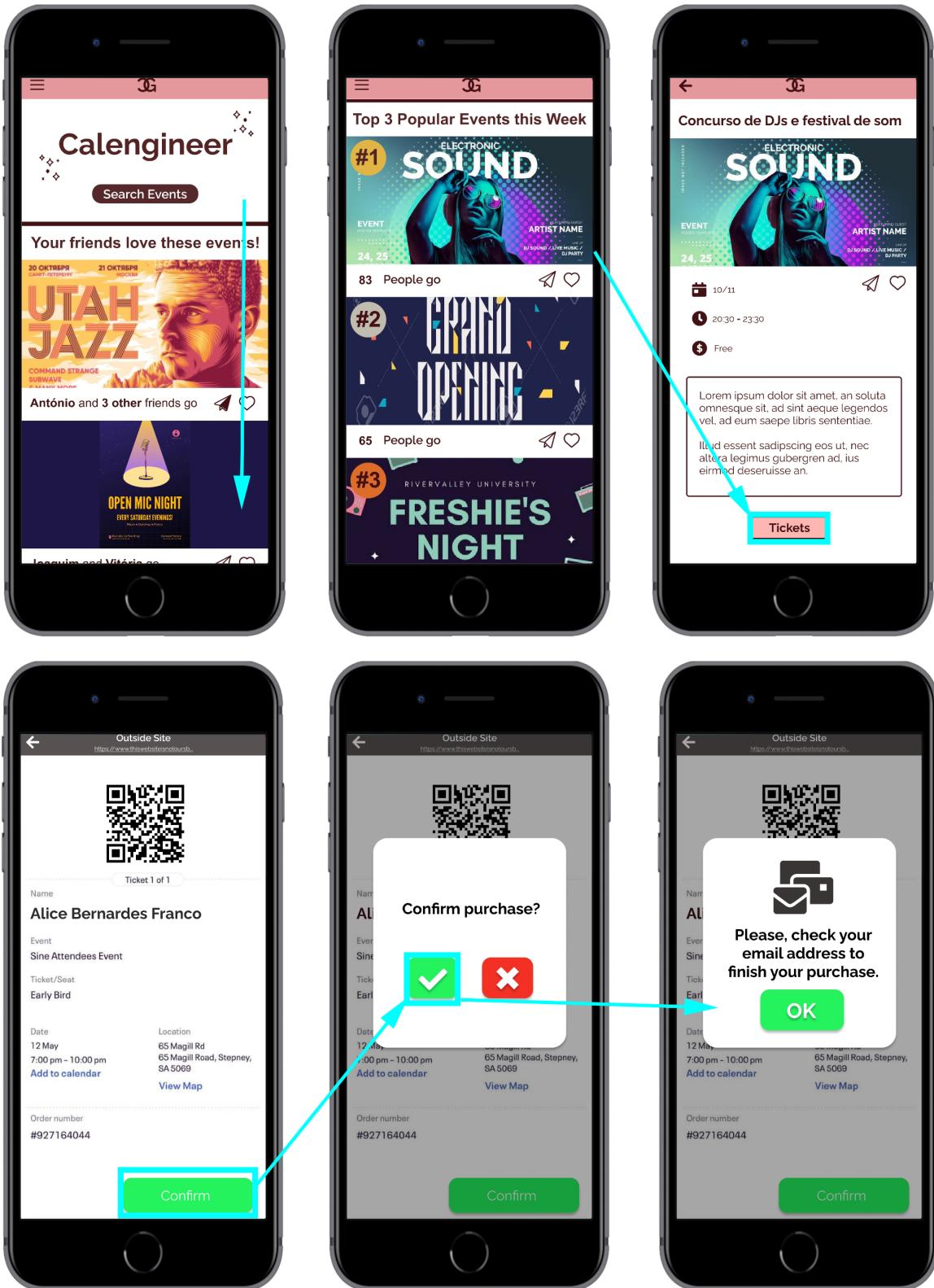
Wireflow for Task 2: Try to change classes in Human Computer Interaction with the student Pedro Dias



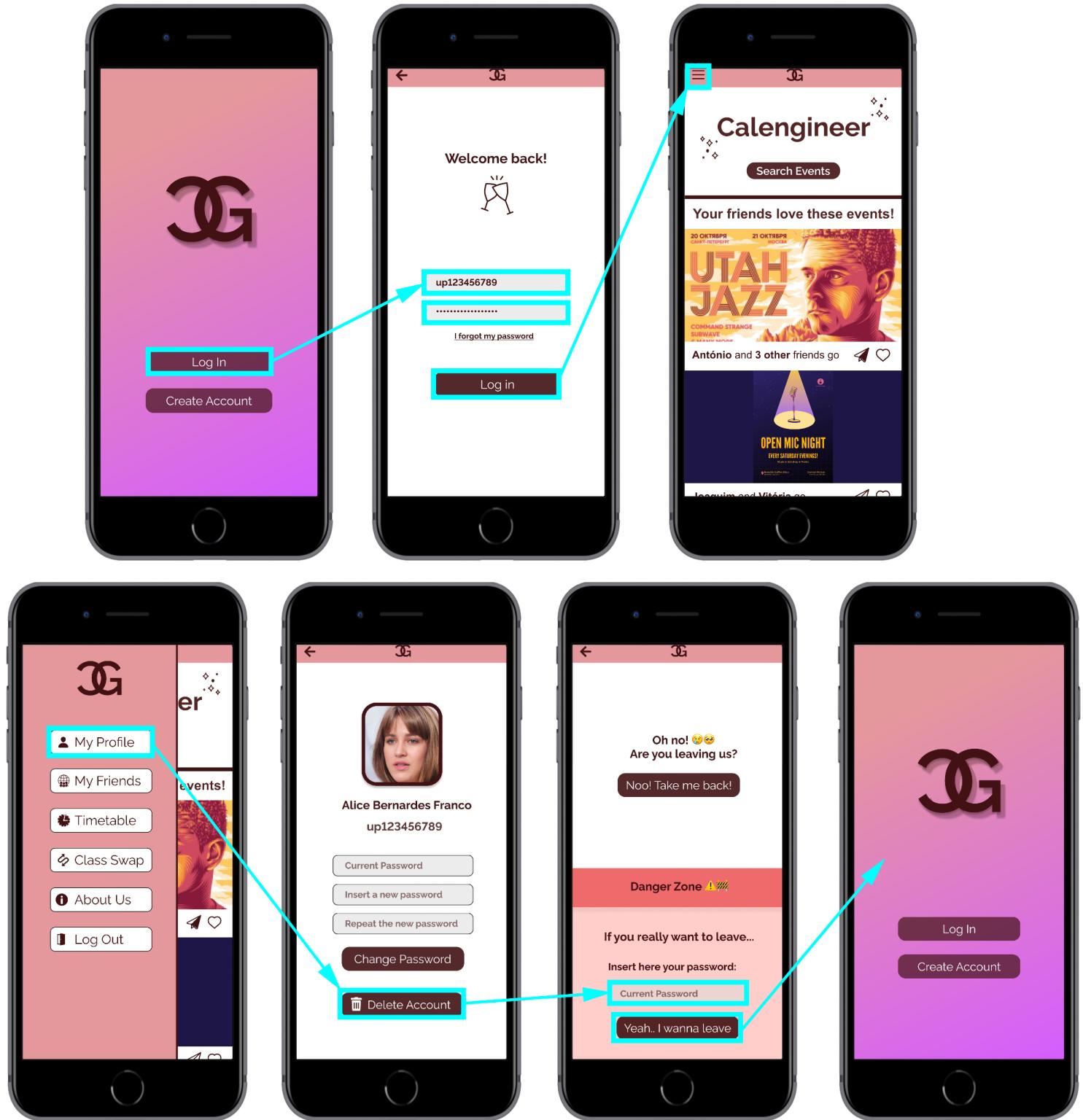
Wireflow for Task 3: Write down in your schedule a trip to the cinema with your friends this Wednesday from 19:00 to 21:30



Wireflow for Task 4: Search and add the student Ramiro Costa to your friends



Wireflow for Task 5: Sign-up for the most popular event the week



Wireflow for Task 6: Log in and delete your account

3.2. User Evaluation Protocol

3.2.1. Objective

We are developing Caleengineer, an app aimed at University of Porto students, whose main objective is to provide a virtual platform with intuitive and easy tools that can be used for time management, swapping classes with other students and discovering events related to university life.

In order to understand if Caleengineer fulfilled its target audience needs and expectations a study was conducted. The main goal of this study was to see if, and in which way, our target audience would be able to perform complex tasks in the app without any help or hints and feel satisfied using the prototype.

Data regarding time, clicks, mistakes and pages visited while using the app were collected as well as a form where users could give feedback about their feelings while using the app.

3.2.2. Tasks

The users were asked to perform a total of 6 tasks. These were deliberately complex, involving many clicks and going through different screens, since we believed this would result in more useful data. The tasks chosen were the ones displayed in the wireflows of 3.1:

- **Task 1:** Recommend the 3rd most popular event of the week to your friend Joaquim;
- **Task 2:** Try to change classes in Human Computer Interaction with the student Pedro Dias;
- **Task 3:** Write down in your schedule a trip to the cinema with your friends this Wednesday from 19:00 to 21:30;
- **Task 4:** Search and add the student Ramiro Costa to your friends;
- **Task 5:** Sign-up for the most popular event the week;
- **Task 6:** Log in and delete your account.
-

3.2.3. Users

The results were obtained by collecting data from thirty-one students from the University of Porto (our target audience) while performing some tasks in our app prototype.

To make sure the sample of students wasn't biased to users with a specific skill set or experience level, we didn't only interview students of the 3rd grade in LEIC at FEUP. We also got people from other grades (from 1st to 5th), other courses (like LEEC and LEA) and even other University of Porto Faculties (like FCUP and FLUP).

3.2.4. Method

Firstly, the users were given a quick oral explanation of what Calengineer aims to be:

“Our app, Calengineer, is designed to help FEUP students. All users have their profile and friends, the app encourages socialization since its main focus is events divulgation. Fitting these events into a day-to-day life is also facilitated with access to a customizable schedule and calendar for better organization of personal routine. It is also offered the opportunity to exchange classes with other students, to try to get the best possible time.”

Then, they were asked to perform the six tasks in ascending order of their number, no further explanation or hints were provided. The user performance in these tasks (success rate, time, misclicks and others) was tracked using Maze.

Finally, users had to answer a Google Forms questionnaire so they could express their opinions about the system. This included 10 questions with quantitative answers for the System Usability Scale (SUS) but also 3 open questions for users to point out specific thoughts. These open questions were:

- “If you could change anything, what would it be?”
- “What’s something you don’t like about the app?”
- What’s something you like about the app?”

3.2.5. Measures

In our project, we gathered some information, while the users were completing the tasks, that we assumed to be relevant and helpful to better analyze our results.

- Amount of missed clicks
- Amount of time to complete the task
- Success rates
- Failure rate
 - All of the data above was collected using the Maze platform.
- User satisfaction
- User opinion
 - Both were collected using a Google Forms at the end of tasks completion

3.3. Results and Statistical Analysis

3.3.1 Statistical Analysis (Efficiency and Efficacy) - Task 1

Task #	Miss Click Rate	Success Rate	Failure Rate	Average Time(s)
1	29,43%	93,55%	6,45%	35

The following analysis were done for the task duration:

Average	SQ	Variance	Standard Deviation
31,868	12948,021	431,601	20,775

$$N = 31 \quad \sigma = 20,775$$

$$\text{Median} = 26,66 \quad 95\% \text{ Confidence interval : } 31,868 \pm 7,62 \text{ seconds}$$

3.3.2 Statistical Analysis (Efficiency and Efficacy) - Task 2

Task #	Miss Click Rate	Success Rate	Failure Rate	Average Time(s)
2	5,24%	96,77%	3,23%	20

The following analysis were done for the task duration:

Average	SQ	Variance	Standard Deviation
19,745	7321,539	244,051	15,622

$$N = 31 \quad \sigma = 15.622$$

$$\text{Median} = 14 \quad 95\% \text{ Confidence interval : } 19,745 \pm 5,73 \text{ second}$$

3.3.3 Statistical Analysis (Efficiency and Efficacy) - Task 3

Task #	Miss Click Rate	Success Rate	Failure Rate	Average Time(s)
3	54,39%	100%	0%	26

The following analysis were done for the task duration:

Average	SQ	Variance	Standard Deviation
26,101	10501,923	350,064	18,710

$$N = 31 \quad \sigma = 18,710$$

$$\text{Median} = 21,67 \quad 95\% \text{ Confidence interval : } 26,101 \pm 6,863 \text{ seconds}$$

3.3.4 Statistical Analysis (Efficiency and Efficacy) - Task 4

Task #	Miss Click Rate	Success Rate	Failure Rate	Average Time(s)
4	6,89%	100%	0%	16

The following analysis were done for the task duration:

Average	SQ	Variance	Standard Deviation
16,315	3148,788	104,960	10,245

$$N = 31 \quad \sigma = 10,245$$

$$\text{Median} = 12,76 \quad 95\% \text{ Confidence interval : } 16,315 \pm 3,758 \text{ seconds}$$

3.3.5 Statistical Analysis (Efficiency and Efficacy) - Task 5

Task #	Miss Click Rate	Success Rate	Failure Rate	Average Time(s)
5	7,25%	100%	0%	14

The following analysis were done for the task duration:

Average	SQ	Variance	Standard Deviation
14,349	1277,848	42,595	6,526

$$N = 31 \quad \sigma = 6,526$$

$$\text{Median} = 11,49 \quad 95\% \text{ Confidence interval : } 14,349 \pm 2,349 \text{ seconds}$$

3.3.6 Statistical Analysis (Efficiency and Efficacy) - Task 6

Task #	Miss Click Rate	Success Rate	Failure Rate	Average Time(s)
6	18,76%	100%	0%	15

The following analysis were done for the task duration:

Average	SQ	Variance	Standard Deviation
15,207	759,855	25,329	5,033

$$N = 31 \quad \sigma = 5,033$$

$$\text{Median} = 14,16 \quad 95\% \text{ Confidence interval : } 15,207 \pm 1,846 \text{ seconds}$$

3.3.7 Statistical Analysis - Satisfaction

To evaluate user satisfaction, users who tested the prototype in Maze were invited to answer a Google Forms with their thoughts about the application.

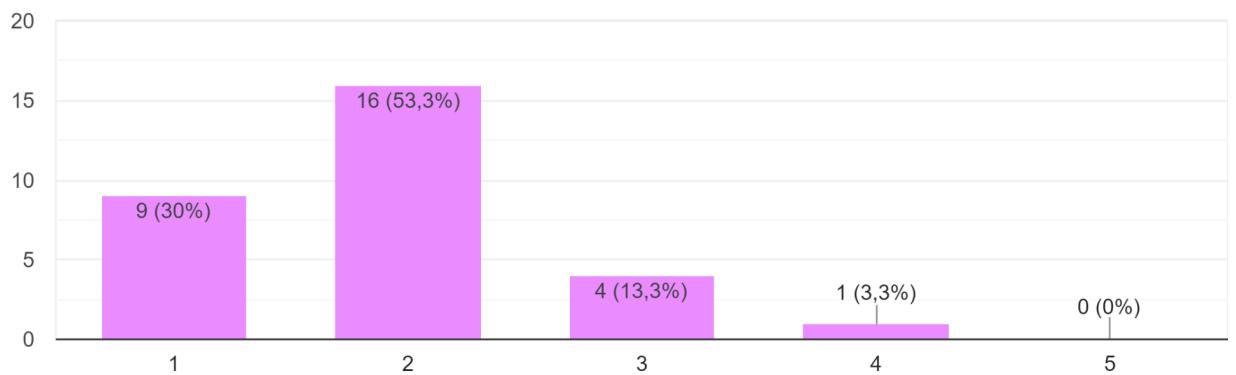
The questions could be answered on a scale of 1 (“Strongly Disagree”) to 5 (“Strongly Agree”) and asked from the opinion regarding the complexity, consistency, ease of use, integration and confidence when using the system.

Complexity:

Most people (83,3%) found the system from simple to very simple, only 3,3% considered the system unnecessarily complex.

I find this system unnecessarily complex.

30 respostas



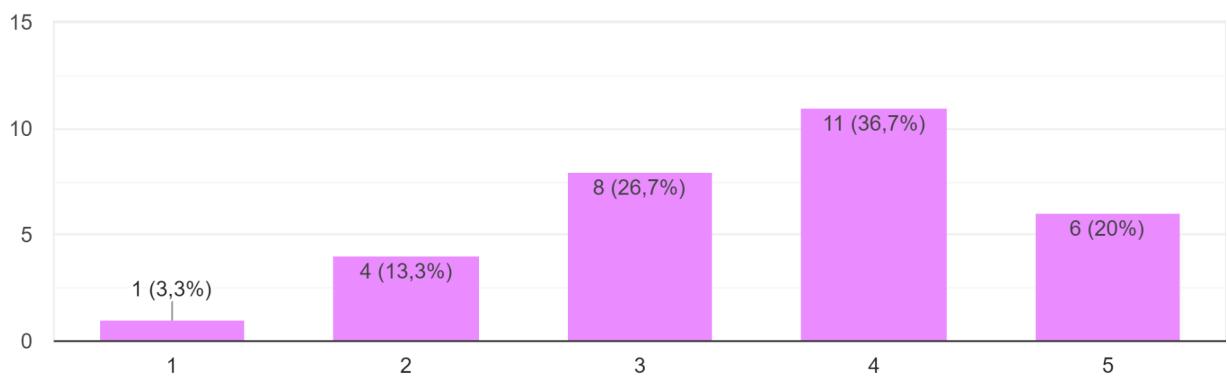
Frequency of Usage:

Most people (56,7%) would like to use this system regularly.

It should be noted that a low score on this question may not mean that the user does not like or find the application unnecessary, it could mean that it does not have features that they would use on a regular basis, but that are important from time to time

I think I would like to use this system often.

30 respostas

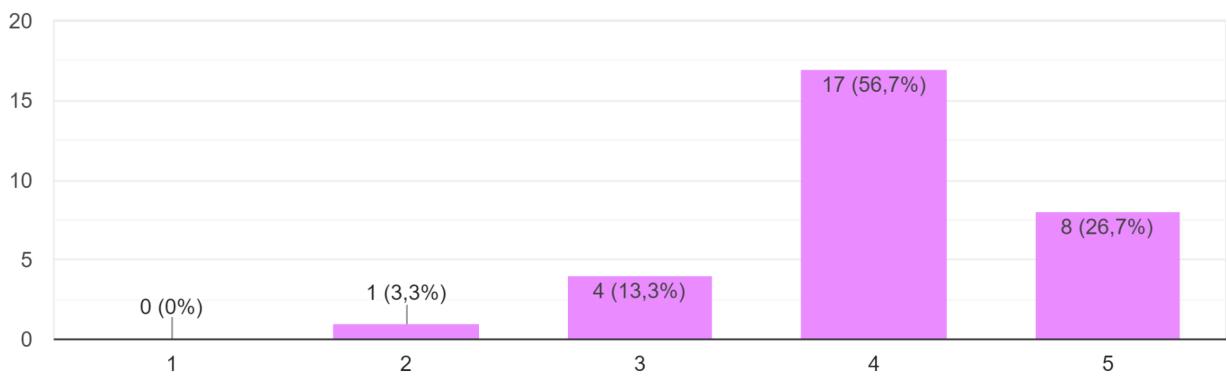


Ease of Use:

A large percentage of surveyed users (83,4%) found the app from easy to very easy to use.

I found the system easy to use

30 respostas

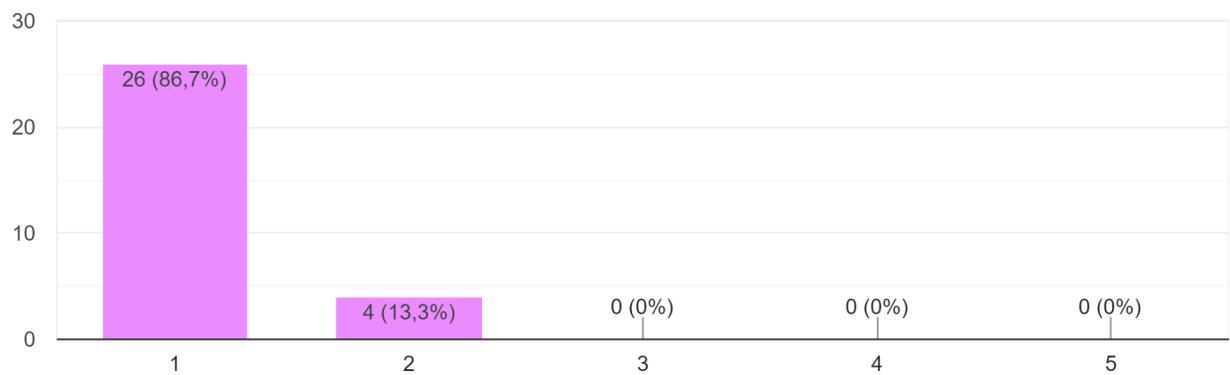


Need of Technical Support:

Most people thought they wouldn't need a lot of technical support.

I think I would need support from a technician to be able to use the system

30 respostas

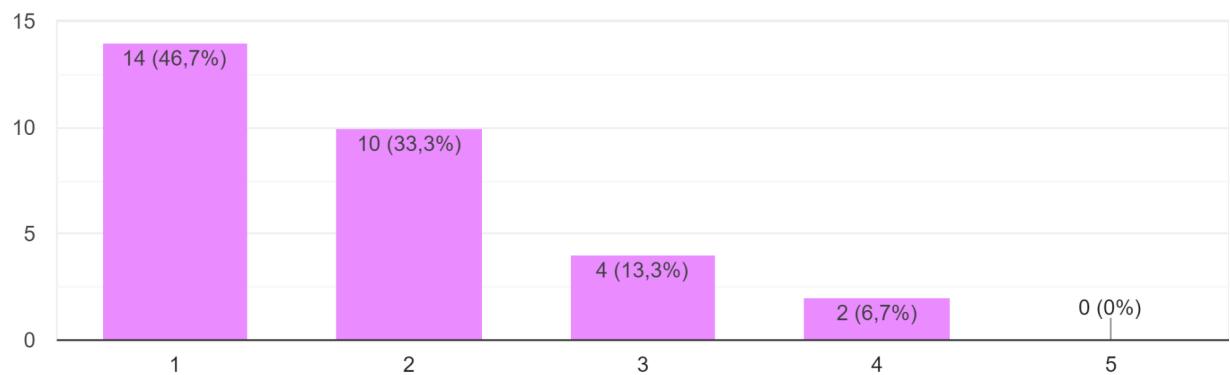


Integration:

Most people thought that the system was well (36,7%) to very well (43,3%) integrated.

I think the system has too many inconsistencies

30 respostas

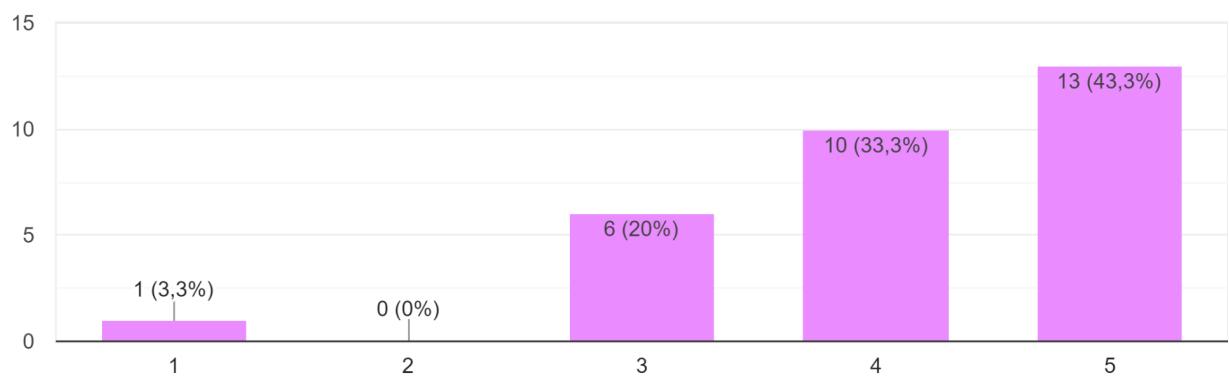


Ease of Learning:

The majority of the users thought that people could learn to use the system quickly. A part of the users (20%) considered the system not easy nor difficult to learn and 3,3% thought that it's hard to understand the usage of the app.

I imagine people will learn to use this system quickly

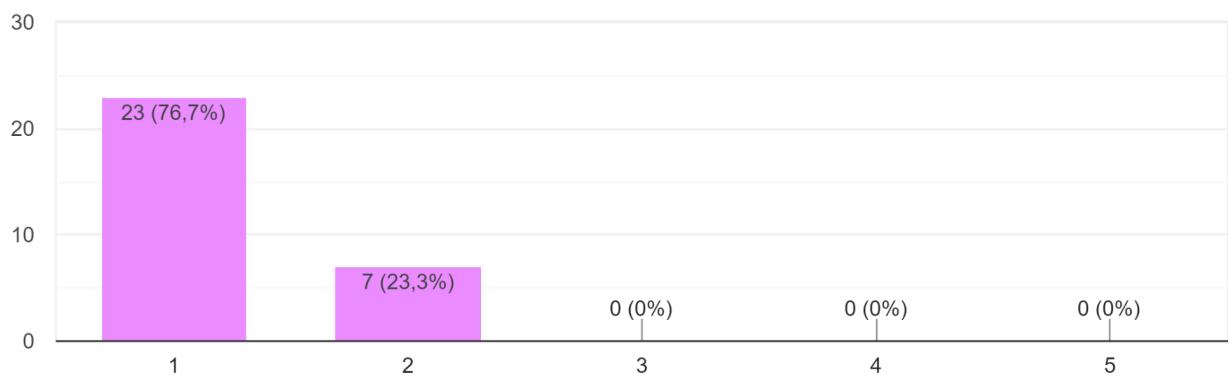
30 respostas



The surveyed users responded that they did not feel that prior knowledge was needed beyond what they already had to take advantage of what the application had to offer.

I will need to learn many new things before I can use the system

30 respostas

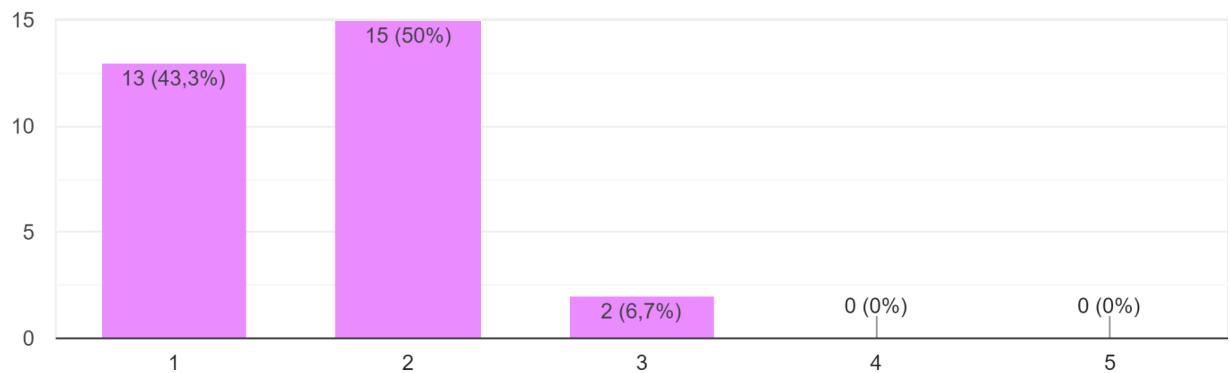


Difficulty of Usage:

93,3% thought that the system was not difficult to use, a small portion of voters thought that the system was not easy nor difficult to use.

I thought the system was complicated to use

30 respostas

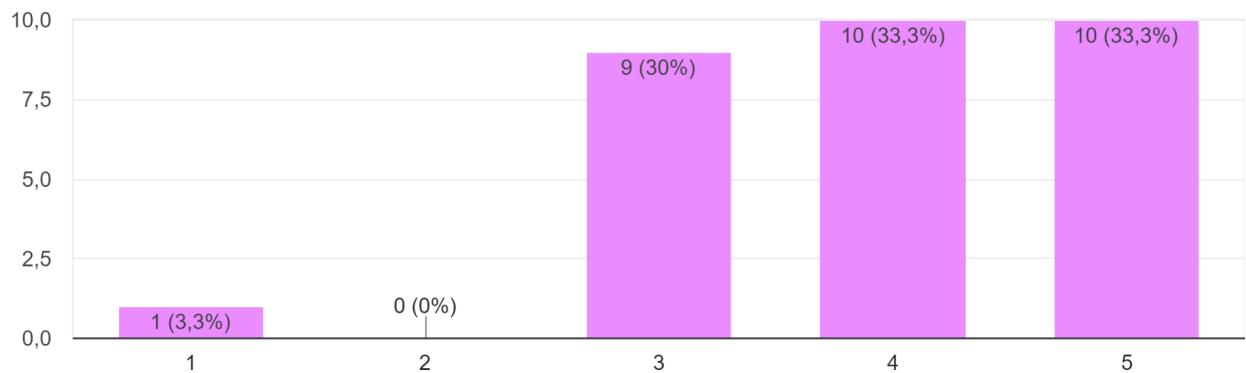


Confidence using the system:

About 66% of the people surveyed felt confident while using the system, 30% didn't feel a lot of confidence, but they didn't feel intimidated either. Only 3,3% of the users didn't feel confidence at all while using the system.

I felt confident using the system

30 respostas



Open questions

The open responses helped us to understand what already satisfied users and what we could improve in the future. Some of the examples of these responses were:

- "I did not understand what was the most popular event."; - this answer may clarify why the first task took longer than others.
- "It's looks really nice and professional made";
- "Ease of use";
- "Certain areas could be more easily accessible with a footer, for example".

Overall, the answers showed a great satisfaction rate, which can be seen below in the annexes.

3.4. Conclusions

Overall, we consider this project a success. The feedback we earned was mostly positive and users seemed to like our ideas and their execution, which tells us that our efforts were placed in the right places.

These 3 project phases all taught us important principles for designing UI for the best UX, and the feedback from others proved more valuable than we were expecting, since we alone couldn't grasp many of the app's problems. Without it, we would probably just design the app for us, not for the users, which wouldn't result in a massively appealing design or experience.

The final prototype still had features to refine, but we'd already managed to fix and address user complaints made before successfully. So we're sure that, with more iterations (and following user evaluations), we would be able to refine our design even more and develop this idea into something valuable and useful for our target audience.

3.5 Annexes

- [Google Forms to evaluate user satisfaction](#)
- [Answers to google forms user satisfaction in a spreadsheet](#)
- [Google spreadsheet where some statistics were calculated](#)
- [Figma - Calengineer](#)
- Note: unfortunately, the Maze public link to share only lasts 24 hours, but we will gladly share whenever asked

