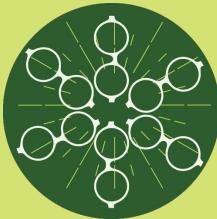


# CO<sub>2</sub> Tracker



# Final Report

A User Centered Design  
Project.

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01

# Executive Summary

# Project Overview

We proposed ourselves to help people become more aware of climate change and to motivate them to replace some of their habits for more sustainable ones.

## User Research

The user research was a crucial tool in our development, as it gave us guidance throughout the iterations of implementation. Before the implementation, we conducted interviews with people with knowledge about the environment and data tracking, as well as generalized questionnaires to understand the needs and preferences of possible users. After building the prototype, we tested it with our users to find ways to improve the usability of our app.



## Design Process

To design the screens for our prototypes we used Figma and to integrate the screens and buttons we used Framer. These tools allowed us to go all the way from the Low to Mid to High Fidelity prototypes.

## Solution

The solution we found was a smartphone app that tracks daily activities of users with concern to their environmental costs - transportation, housing, shopping and eating - and motivates people to improve them. Our algorithm calculates the amount of CO<sub>2</sub> emitted, which the user can compare between their previous days and also between peers. The app also gives personalized tips according to the habits that need more attention. For the app to be available for both iOS and Android, we built it using Flutter, with its Dart language and Firebase backend.

02

# Background

# The Team



**SAMUEL  
DOMIKS**

Project Manager  
ist198261



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FEIJÃO**

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LOPES**

Design Lead  
ist186518



**PATRÍCIA  
PIEDADE**

Documentation Lead  
ist189515

## We are 6GEEKS

We are a group of LEIC/MEIC students joined by the belief that geekiness does not automatically exclude artistry.

We have a passion for sustainability and saving the planet we inhabit.

But at the end of the day we are just a bunch of geeks trying to change the world one user at a time!



# The Client

For our project we identified that there would be two main stakeholders who would most benefit from using our CO<sub>2</sub> tracker:



- people that care about the environment and want to change their behaviour and make their friends and family more environmentally aware (e.g. Environmental Activists);
- people that already track some of their activities such as the daily number of steps and location (GPS) and could have their life bettered by a more eco friendly approach.

# Schedule



03

# Project Overview

# Context

Climate change is one of the main challenges thrown at humankind for this century. It is certainly happening and the whole species must make an effort to correct it, in order to save the planet. More so, this pandemic has allowed us to see that it is possible to decrease our CO<sub>2</sub> emissions.

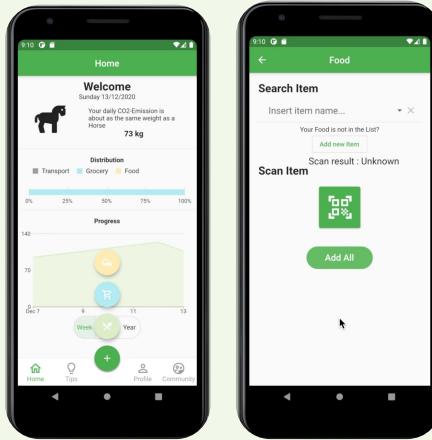
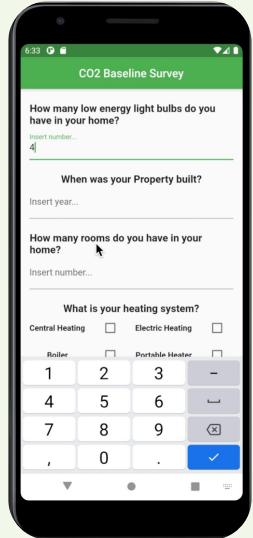
# Idea

Our challenge was to create a tool that would allow users to track their daily CO<sub>2</sub> emissions in several categories and give them tips on how to decrease them, while also giving them some challenges and competition among the community. If we could help several users make an individual effort, it could already make a real difference for the planet.

# Key Features

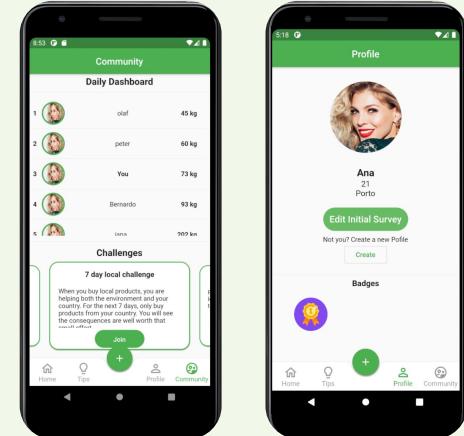
## CO<sub>2</sub> Baseline Survey

This survey is the first feature that shows up when the user first opens the app. It allows the user to input housing and energy related data. A CO<sub>2</sub> baseline is then established and the user can start changing the world



## Data Input

This feature allows users to input data in three separate categories: Food, Shopping and Transportation.



## Dashboard

This is the home screen where users can check their daily emissions, how they relate to previous days and in which categories they are emitting more CO<sub>2</sub>.



## Community

Users may also interact with their community through challenges and check how they rank in the leaderboard.



**04**

# **Process**

# Initial User Research

Starting with the stakeholder identification, our group did a brainstorming to analyze our users, focusing primarily on them regarding the course topic. After this initial brainstorming session (according to PMBOK-Guide), we identified that our users would be primarily people who already track, digital natives and people who are aware of the climate change and want to change their behavior accordingly (e.g. climate activists).



## Methods

After identification, we used different methods, so called method triangulation to identify the most concerning issues.



Therefore we started with an initial semi-structured interview with a climate activists to identify the most urgent challenges regarding daily CO<sub>2</sub> emissions.



Based on this and a literature review we developed a survey to get a more representative view on challenges.



Adding contextual inquiries with three people who are already tracking habits, we could analyze issues regarding tracking applications and understand the users need regarding tracking and their mental model of tracking.

# Categorizing Emissions

Analyzing the answers of the survey, as well as the interview, we understood that the highest factors on CO<sub>2</sub> emissions, which people can track are housing, shopping, food and transportation.



# Personas and Scenarios

Based on our findings we created two personas and scenarios, which can be found in the Annex. They served as our guideline for the development which we could always refer to if we were not sure which feature is important or we should focus on.

# Design Goals

Additionally the contextual inquiry provided us with information, which challenges we will need to surpass to develop a tracking application.



Additionally automatization could help to reduce the manual work.



Additionally most of the potential users discussed the importance of challenges and social translucence to being kept motivated.



Further personalization could keep them attached to their app



**Jose Almeida**

*"Felt like I did something. It felt like an achievement"*



**Filipa Silva**

*"Please do an app to help us be more ecologic"*

# Prioritizing Development

## Comparative Analysis

Before starting the development we needed to understand also what in our regard is missing in other applications, therefore we did a comparative analysis of three other applications, Capture, CO2 Cards and Ellie.



One of the major points were the missing social translucence, which most of our users wished for.

Automation was also not really implemented, for example an automated transportation recognition system.

One of the major points were the missing social translucence, which most of our users wished for.

Automation was also not really implemented, for example an automated transportation recognition system.

Additionally none of them had a CO2-Baseline estimation based on the housing, which is unlikely to change very often, like the chosen transportation method and distance.

## Platform Choice

Reconsidering our personas and the results of our comparative analyses we concluded that a mobile application would fit the needs of our potential users. For example looking into the automatic transportation or the need to enter whenever data into the tracking system could only be accomplished by a mobile application.



# Defining and Categorizing Features

Further we analyzed which features where the most urgent ones, by understanding our users needs and categorizing them on high/medium/low impact and complexity scales.

By assessing our own capabilities, we could categorize them in the complexity scale, as well as analyzing the number of mention and the corresponding adjective.



We concluded that following features where the ones with the highest value, and most of them also with an moderate complexity:

**Dashboard:** Which gives the user the possibility to understand the impact of their tracking



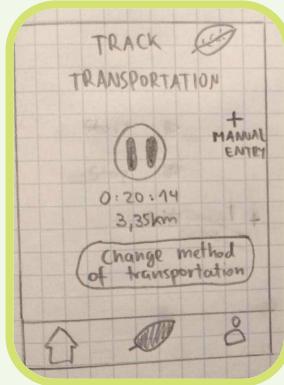
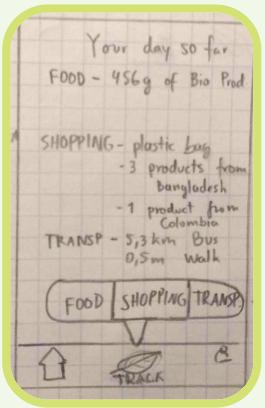
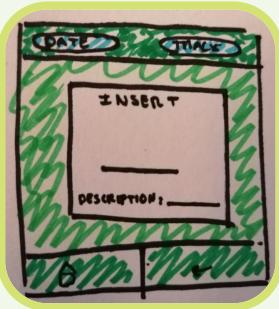
**Input:** Since tracking data surely need the possibility to include inputting manual data, or changing automatically recorded, but wrong, data.



**Housing:** Adding this non-volatile information gives a good baseline estimation for the daily housing emission which everyone has and can differ.

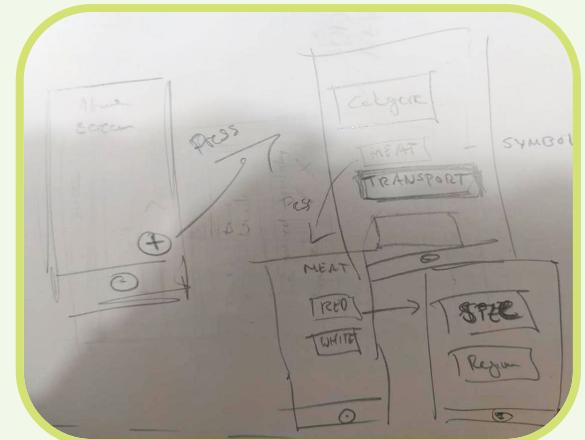
# Ideation

By looking into our Personas, we understood the needs and technical knowledge of our model users which we could base our prototype on.



To develop ideas on how to design our application and not be limited to existing solutions/prototyping tools, we started doing the 10+10 Method (slightly modified), where each of us drew their idea of how a certain feature should be designed.

By discussing and analyzing the pros and cons of each drawing, we decided through group discussion on a combination of the best and most intuitive ideas and based our Low Fidelity Prototype on these.



# Low Fidelity Prototype

The next steps consisted of developing a Low Fidelity Prototype, so we could test if the mental model of our users corresponds with the design flow of our tracking application.

Welcome Back!  
4/11/2020

Today you produced:  
One cat worth of CO2  
15 kg

Transportation  
Food  
Shopping

Monday Tuesday Wednesday Thursday Friday Saturday Sunday

Age:   
City:

Edit initial survey

Badges

HOME TRACK TIPS

Due to the current COVID-19 situation, this was done via Figma, not with the usual paper prototype.

## Wizard of Oz Testing

To understand flaws of our design we tested this prototype on three different users with a Wizard of Oz approach.

This is widely used for user testing in an early stage to understand the flaws and strengths of a prototype.

Therefore we decided on four tasks, which the user had to fulfill:

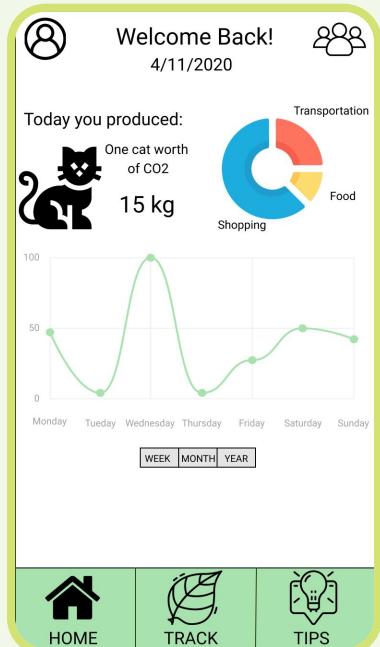
1. Input what you ate for lunch and your morning commute;
2. Find your total CO<sub>2</sub> emissions for today;
3. Add your housing information to the Initial Survey.



Additionally the users could also explore the app further if they so desired. During the session we used the think-a-loud method to capture the thoughts of the users.

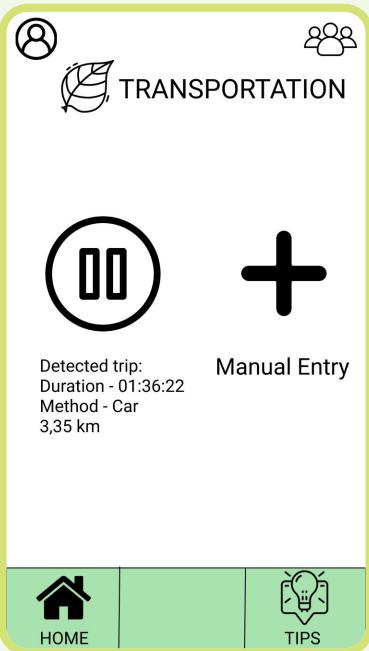
# Insights

The following points were the key takeaways:

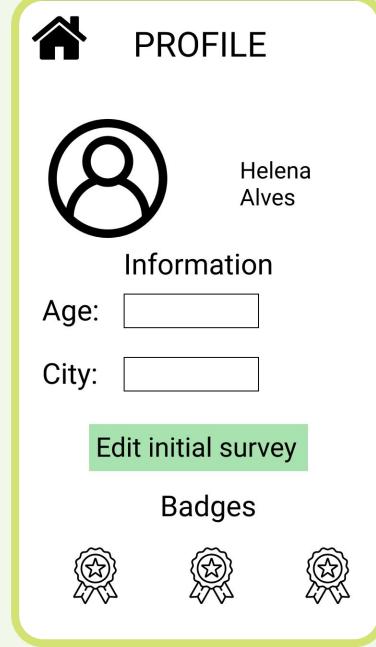


Navigation Bar is confusing and non consistent;  
The cat-metaphor is nice;

Transportation  
Tracking is confusing;

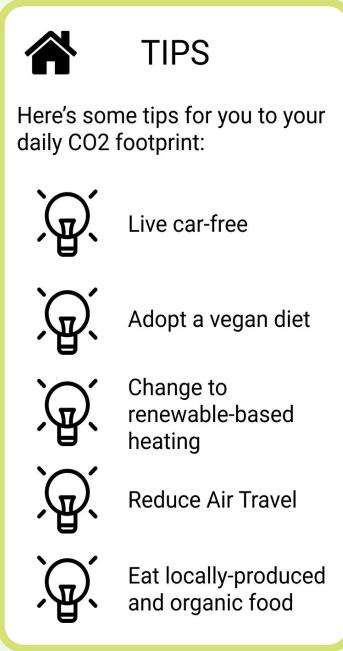


20



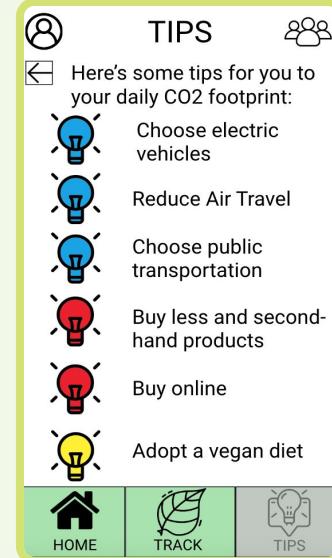
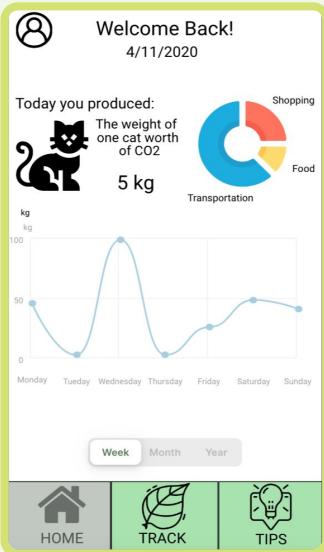
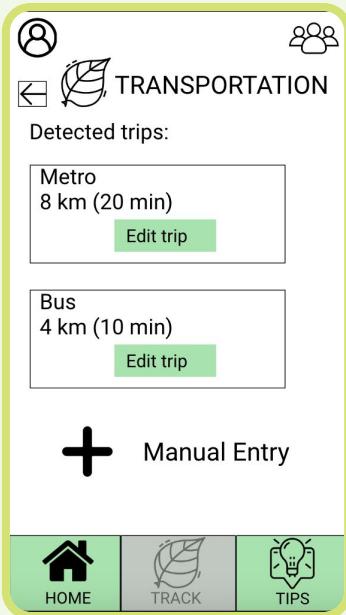
background should

Tips page should further personalized.



# Mid Fidelity Prototype

After analyzing the results of the Wizard of Oz method we further changed the following aspects in our prototype by using Framer:

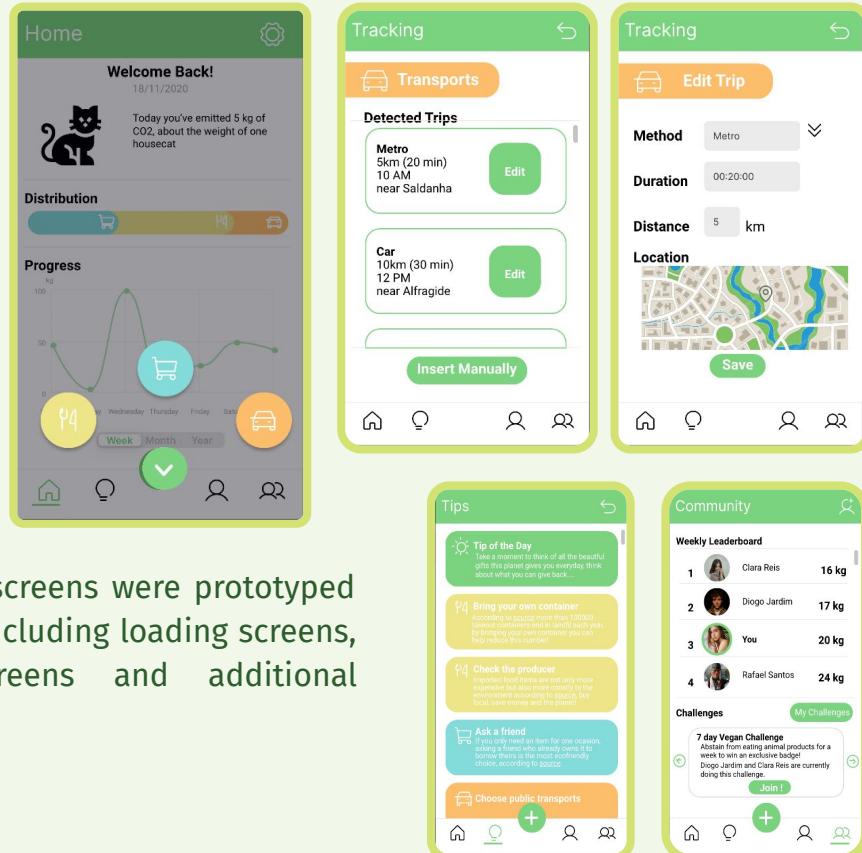
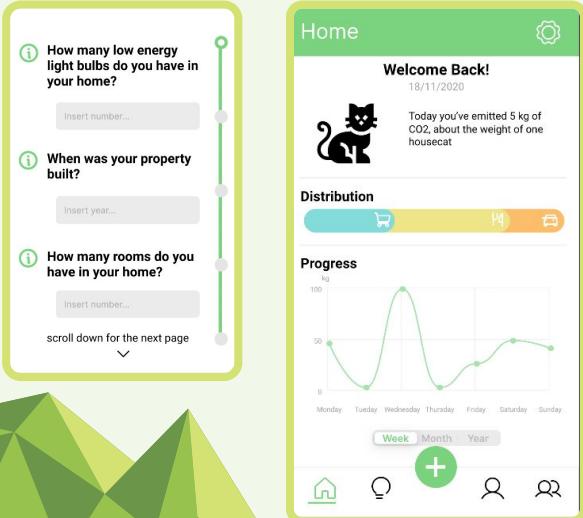


The screenshot shows a survey question: 'How much thought do you give to saving energy in your home?'. It includes four radio button options: 'A lot' (blue), 'A fair amount' (grey), 'Very much' (grey), and 'None' (grey). Below the question are navigation arrows: a green left arrow and a green right arrow. At the bottom right is a text 'Question 1/5'.

- Improving the Prototype regarding the user Feedback;
- Adding Page transitions;
- Further improving the Survey with more specific questions;

# High Fidelity Prototype

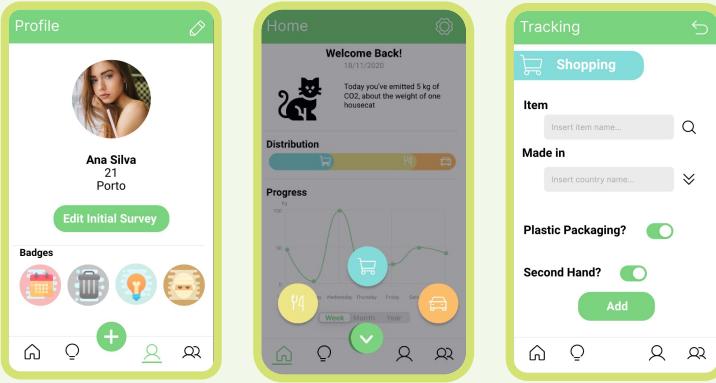
Finally, we started to craft the final design of our prototype by orienting on the user feedback, common well liked design choices of popular apps and the Material Design Guidelines which provide an elaborate way of designing Android applications so users can easily interact with the application and feel already comfortable within.



All additional screens were prototyped at this stage, including loading screens, secondary screens and additional features.

# Usability Testing

By testing our final design, we could further improve it before starting to implement. Testing was done with 6 different users, using a task-orientated approach, similar to what was done in the Wizard of Oz Testing, we could further identify any significant problems with our application and its design.



## Methodology

We tracked the clicks and time of every task. By using the think-a-loud method we could get additional insights from the users.

The following, similar to the first tasks, were used:

1. Fill the CO<sub>2</sub> Baseline Survey;
2. Find your category of most CO<sub>2</sub> emissions;
3. Add a Product you bought to your CO<sub>2</sub> emissions;
4. Find a Tip and your Profile Page.

# Insights

Before testing, we performed the task ourselves in order to obtain a baseline click value for each.

	Baseline	Average	Max	Min
Task 1	15	18.2	28	12
Task 2	0	6.2	20	0
Task 3	5	8.2	8	6
Task 4	2	3.5	8	2

Comparing this with the average number of user clicks the results were quite satisfactory, nearly identical save some well justified outliers.  
Time data was discarded as we found it to be irrelevant, as Framer does not simulate accurate processing time.

These results show that the flow and design of the application is nearly optimal users.

Everything supports the mental model of the user.

Further implementing the material design guideline helped the user to feel fast comfortable with the application.



But also we found out that the initial housing survey needed more refinement, since some questions were not clear to the users.

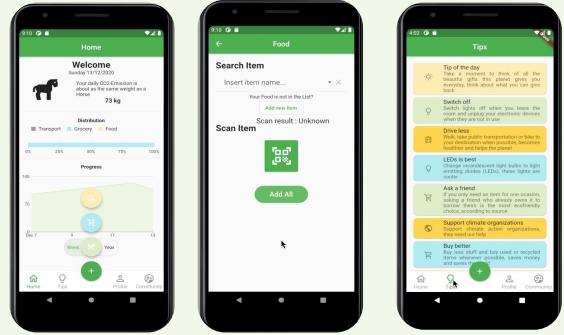
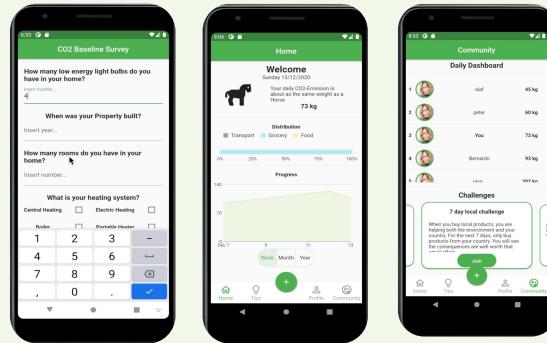
# Fully Functional Prototype

We firstly analyzed current technologies which are available, and quickly decided to implement it with Flutter, a Framework for Dart, which provides Material Design widgets that can be easily implemented. This fitted our approach the most.



Additionally we decided to use Firebase as the backend, since it made it possible to easily implement Challenges to keep our potential users motivated and User Profiles for the personalization.

- Daily Baseline Estimation via Housing Survey
- Data-Input for Shopping, Food, Transportation
- Mockup for Automatic Food Recognition and Transportation Recognition
- Mockup for Badges for successfully finishing challenges



- User Profiles
- Adding new Products/Foods
- Tips Page
- Daily/Weekly/Monthly Dashboard
- Challenges which can be accepted
- Weekly Comparison of Users of the Application
- Navigation Bar

05

# Conclusion

# Final Thoughts

We clearly saw the effect of talking with users. For example understanding their needs, which sometimes differed from our own, was at times surprising.

Specifically the initial version of the transportation page the mental model was really clear to us, but most of the users during testing were confused by it.

Additionally talking with users provide the possibility to more informed and well fundamented choices. Sometime we were not sure if our approach was the best, but the provided feedback helped us in understanding whether or not we were on the right track. Due to some limitations, like time, we were unable to do some more user testing, for example regarding the Low and Mid Fidelity Prototypes. This clearly would improve our application further.

Additionally we understood that a diverse team could help us develop a better application, since this represent our users better.

# Potential Improvements

There were more complex features that, due to time and technology constraints we were unable to implement, for example Automatic Transportation Recognition, Automatic Food Recognition (possibly using Firebase Image Recognition Framework), User-Authentication, Adding verified user for adding Products, Adding User generated Challenges, Combining Challenges with the Weekly Leaderboard.

As we mentioned previously we would have also benefited from further user testing, for example on the Fully Functional Prototype, and maybe some different testing methods, some of which were made impossible due to the COVID-19 pandemic.



The background features a repeating pattern of green and yellow triangles of varying sizes, creating a sense of depth and motion.

06

# Annex

# Jose Almeida



*"Felt like I did something. It felt like an achievement"*

**Age:** 22

**Work:** Student

**Family:** Single

**Location:** Lisbon, Portugal

**Character:** Digital Native

## Bio

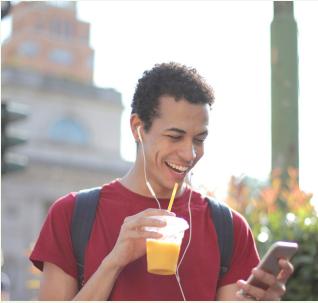
Jose is a digital native, with technology he manages to change habits for the better. He already tracks his GPS location and steps automatically, and inputs his calories manually. Since he was raised with a lot of technology, he uses it to support his daily tasks and routines. He wants to understand the data he tracks and analyze it.

For him, his phone an integral part of his daily routine, he uses it every day, on the go. Since his device is always on him, he likes having his information all in one place. Jose is an avid social media user and finds apps like Instagram very intuitive. He is used to user-generated content

## Tech



# Jose Almeida



*“Felt like I did something. It felt like an achievement”*

## Tracking



## Goals

- I want to see my progress visually.
- See the impact of the things I do.
- Change my habits
- I want to have Personalized Feedback
- I want to understand the collected data

## Frustrations

- Receiving too many notifications from one App.
- Complicated to find the right tracking-category.
- Too much unnecessary information about the tracked data.
- Data input takes too long.



# Scenarios

Jose, before going to bed, wants to capture his calories consumption of the day, since he thinks that he probably ate today more than he wanted. The application already notificated him yesterday about adding his daily consumption, but Jose found it really annoying. Today he wants to track his diet, this is the more comfortable way because the app shows him his weekly calorie consumption. He starts the application, and he easily finds the the field to input new data since it reminds him of instagram. Today he ate a frozen pizza, so he searches in the lunch categorie and finds even the brand of the pizza, which makes him feel to track the correct amount of calories. He adds it to his consumed dishes for the day. The dinner was at a restaurant, but luckily another user of the application has already entered the day for this dinner, which he easily can add. He also adds the consumed water for the day, but it is annoying since it is the same as the last days, but the app doesn't remember it. After inputting the data, he looks into the main screen, he likes that he has now the overview of the consumption calories. Since he also walked a lot today, the app showed him that he is allowed to eat more. He could scroll also down and see more differentiated information, but this would be too much information. Also he didn't really understand everything which is shown there. After that, Jose is finally finished. It didn't took him more than 5 minutes, which he likes. He can go now to sleep and start the next day.

# Filipa Silva



*"Please do an app to help us be more ecologic"*

**Age:** 24

**Work:** Student

**Family:** Dating

**Location:** Sintra, Portugal

**Character:** Eco Lover

## Bio

Filipa is an environmentalist at heart. She is a member of her University's environmental student association. Since watching *The True Cost* and *Cowspiracy*, Filipa has tried her best make eco positive changes in her daily life. She and her friends even went to a Climate Strike in Lisbon.

She uses Twitter and Observador to stay up-to-date on news a current events and Facebook to find events related to the movements she supports. Her phone auto-tracks her steps, but she doesn't look at them much. Since high school she's been tracking her menstrual cycle in an app recommend by her favorite YouTuber. Other than that she tries to keep her life offline.

## Tech

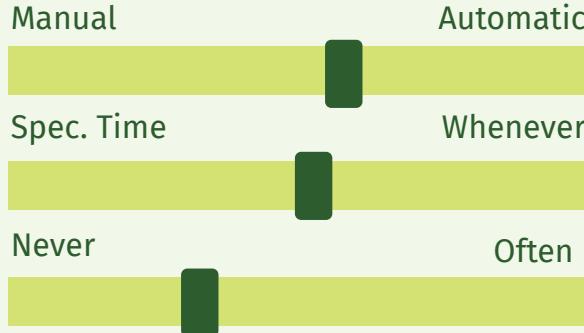


# Filipa Silva



"Please do an app to help us be more ecologic"

## Tracking



## Goals

- I want to be more eco friendly in my daily life.
- I want to raise awareness to the ongoing Climate Crisis.
- Incite systemic changes at a governmental level.
- I want to learn about my own impact in the environment.

## Frustrations

- Lack of interest in the environment by some of my peers.
- Apps that require me to spend too much time on my phone.
- Not seeing the impact of small lifestyle changes I make.
- Forgetting about a habit I'm trying to implement and giving up.



# Scenarios

Filipa, while going home by bus, was scrolling on twitter and noticed that a friend shared the CO<sub>2</sub> Tracker app. She was curious, since she had never used any application of the kind, nor had she ever heard of it, so she decided to try it out and downloaded the application. She thought she was an "environmentally friendly" person, so the application sparked her curiosity. She started by taking the initial survey, inputting data about her house and energy consumption. As soon as the results were calculated, she was shocked by the value of her emissions. Although 12kg was below average, as the app informed her, it was still quite high after all things she had done to be more eco friendly. Subsequently, he shared the results on twitter to all his friends, not only to make the application known, but also to show her case and maybe, finally get her most stubborn friends to join her in a journey to be more eco-conscious.

# Annex

## Architecture

For the functional prototype we use Flutter as a development kit and Android Studio as a development environment to develop for the Android platform.



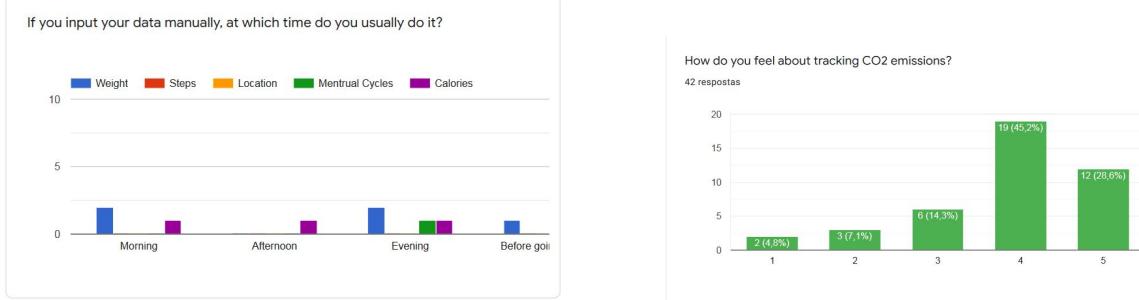
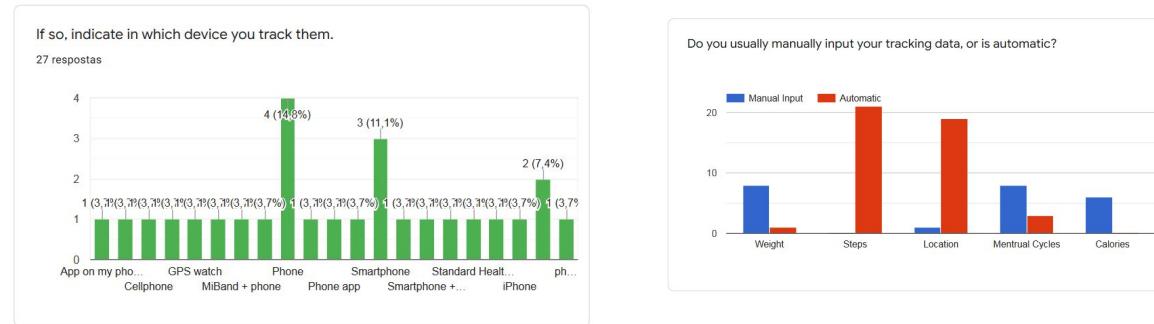
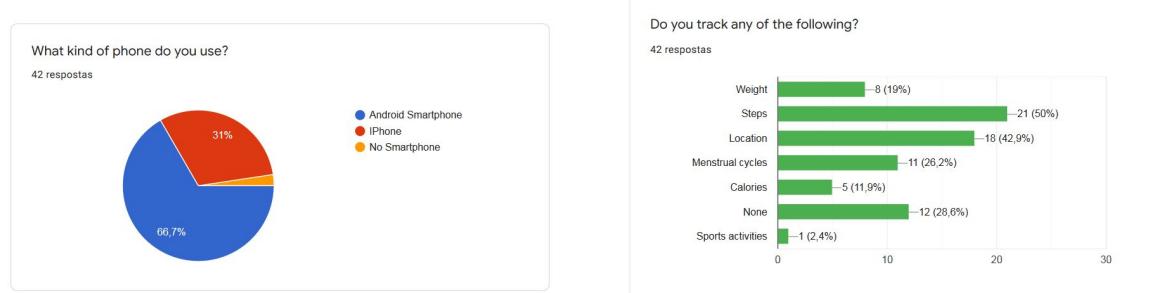
Our GitHub page can be found here: <https://github.com/kuerbisatom/6geeks>  
Our project website can be found here: <https://kuerbisatom.github.io/6geeks/>

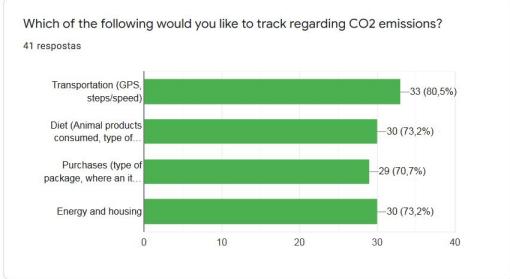
## System Design

We used firebase and flutter, where firebase acts as the backend and talks with the app about storing user information and the tracked data.

## Questionnaires / interviews

The following graphs shows the questionnaire and the results user research.





If there something you wish to add?

2 respostas

the more automated the tracking system, the better

Please do a app to help us be more ecologic!

Would you be available/interested to participate in further user research? If so, give us your email, so we can keep in touch.

5 respostas

tsoracco@itba.edu.ar

Fabio.vellata@mail.polimi.it

guilherme.leca@usp.br

carmenmargarida@sapo.pt

alexandramatos@gmail.com

The following interview aimed to understand what people are looking for and what is their feedback on the tracking app.

## Interview Guideline

Explanation:

A little introduction, don't read, just an idea.

Let the participant talk as freely as he wants, only stopping when it is clear it has nothing to do with the topic, but still give him some time.

Cursive Questions are just meant to be asked if the participants don't elaborate on that part.

Ask every question, even though it is not in this set, if it makes sense? Be creative :)

Introduction:

Thank you for having us and doing an interview for our project. We are a group of students which want to implement a CO2-Tracker for people that wants to track their CO2-Emission and helping to change the behavior, especially behavior which contributes exceptionally high to CO2-Emissions.

To understand the needs of the users we are making this interview with a few persons, so we can develop an application which helps the most and is easy to use for a wide range of people. It will take 20 till 30 minutes, later we will analyze your answers anonymously, so no personal information of you will be used. The other person is only taking notes, I will mainly ask questions, afterwards you can take a look into the notes if you want. Feel free to say everything that comes into your mind.

Question:

We already know that you use Trackers, so can you tell us what kind of activities do you track and how do you track them? (Probably a good idea to work here with the application)

*Automatically or via User Input?*

*Which time do you usually input it?*

*What benefits do you hope from tracking the data?*

*What was the motivation to track the data?*

*Do you look into your tracked data? How Visualization?*

*What do you like the most about the tracking?*

*Why did you choose not another application?*

*Did you miss a day of tracking? How did you cope with that? (Skipped or filled in later)*

Are there any activities which you tried to track but stopped? Can you tell me a little bit about it?

*Was it done via User-Input? What was the problem with that?*

*Did you forget to input data? Why did you forgot?*

*What was the most annoying thing?*

*How could it be prevented that you stopped using the app?*

*After which time did you stop tracking?*

*Did you still wish you could track the data? How would it be more convenient to you?*

Thank you for taking the time to answer our question. If you want to add something, feel free to add anything.

## The answers of the interview.

**14/10 14:00 (Calorias)**

Since I started to get older I started running to lose some weight (I run about 2 to 3 times a week). Earlier this year I was offered a wristwatch that has the ability to track calories, the number of steps and the distance covered.

The watch has the ability to collect data automatically from the moment I turn it on, put it on my wrist and start running. Later, it synchronizes with the application and puts the data there.

By tracking the data I get a much better / better notion of my evolution (whether I have progressed or not). In addition, I have much more sense of my performance in training.

I had no motivation to start tracking, it was my children who offered me the watch. I had seen several friends who used it and was curious to try it.

At the end of training I always see the tracked data and at the end of each week I do an analysis of the weekly data.

I usually see training data on the watch, but when I want to see data for more than one training (at the end of the week for example) I see it in the application.

What I like most about tracking is being able to easily follow my evolution, whether in miles traveled or in weight loss. The fact that I have such easy access to that information, makes me want to train more because I can "see the results" right away.

## 13/10 16:00 (Menstrual)

For about 2 years I have been using a tracker for my menstrual cycle through an application I have on my phone.

I put the data. I always put the data at night, before going to sleep.

By tracking the data I can much more easily control my menstrual cycle, I always know when I will have the period and the days when I will be most upset (laughs).

I started tracking because I had some difficulty in knowing when the period was coming and so I can always prevent myself, on the days when I will probably have the period I am already prepared.

I usually look at my data just to know at what stage of the menstruation cycle, I usually look at 1x per week generally.

I chose this app because it is what my favorite youtuber uses.

I tried to track the money I spent per month (where and how much), but gave up after 15 days.

I put the data in the application, but I had a problem, as I spend money several times a day, there was a time when it was very boring to record all my expenses and I often forgot to insert.

Applications to record expenses should be easier to use, have too many processes.

### Interview – Calories/Steps

#### Steps-Tracking

Tracking mostly steps, phone does it automatically. Using the I-Phone Health app. Showing monthly average. Don't understand the impact of the tracking. Just understanding if it is a lot or a little. I do not input anything. Doing it because I'm not very sporty. Walking is treating like an exercise. Feels like I did something. Feeling like an achievement. Input the weight at start makes me feel I can rely on the steps. It also shows calories. Not looking into all available data which is shown in the app. Looking once/twice a month into the data, can see a overview really fast. The possibility to put my weight into the application makes me feeling it is personalized. "Putting myself in". Application was already installed on the phone. Missing "All data in one place!"

#### Calories-Tracking

App: Yazo. All in one app, can connect to steps taken. Counts approximately calories from steps. Can input a longer goal. Sometimes too complicated, too much information. Hard to find, don't know all possibilities. (Finding new stuff during the interview^) I like there is just a list of choosing the food eaten. Notifications is frustrating. Begin to ignore, then just uninstall it. Can keep track of food eaten. I can input a goal, that is good, but should be possible to divide into smaller goals, since I don't see any progress. That is not motivating. Choosing this app because it has more options than other, especially really specific products which gives me the feeling of having an exact calculation of calories, no compromises in choose of products. Also local products. UI too overloaded, to much choices in startup screen. Just use the basic functionality. Hard to find my today tracking, a widget would be nice which would show this information. Goal too far away. Smaller goals. It is boring to not see any progress regarding the final goal. Can connect with health app(step-tracker). Depending on steps allowed to eat more, less. Filling amount of water is to long to do, there should be a widget. It would be nice to do this via voice ("Add drink 3 glasses of water"). At the beginning really excited, for three weeks everyday, then forgot sometimes, then left, also because notifications were disturbing. Started the last days again. Input data is similar to Instagram application, that is easy to use. Divided into topics the food (e.g. lunch, dinner). Really specific inputs available. Verified Products. Also user can add products. Can users share recipe, but I would like to, when I am cooking, input Cheese and get less calorie heavy option for cheese, since I am not cooking with recipes. Specific input, like grams and piece is good. Makes me feel because of the specific products that I can rely on it. It seems accurate because of that. Don't like when I have to many things to do to sign in. Best just connect with an existing Account (Single Sign On). Should be accessible, don't like that I need to remind myself to input data. Don't like notifications. Don't like when I'm using it, the first time, there are to many information. Some features are hidden, and it takes to long to do some things (adding water). Search bar would be nice. Would be nice to have a suggestion based on the last user input. Widget with statusbar would be nice, to see more information. Would like to have monthly reviews. Some Graphs would be nice to see the monthly progression.

## The following document is our framework for the usability test.

Thank you for participating, when doing the usability test, keep in mind, that we are not testing you, we are testing the application. Also speaks everything out which come into your mind, since this is important feedback for us.

Tasks to Perform and things to measure (keep encouraging the person to speak out loud)

1. Start by filling out your CO2-Baseline using the survey.
2. Tell us what was the category which emits the most CO2
3. Add a Product you bought to track the co2-emission.
4. Find a Tip and your User=Profile

What do you like the most in our application?

What did you like?

You can have 5 minutes and check things out on the app

Metrics:

Clicks:

1. 15
2. 0
3. 7
4. 1 + 1

## The following documents are the answers for the usability test.

### User Test 2 (male, 21 years old, student)

*Italics* – My own comments noted as the test took place.

Regular – Direct quotes from the user.

**Bold** – Headers and titles.

Metrics

Task Number	Time (hh:mm:ss)	Clicks (including scrolls)	Typing clicks
1	00:05:07	16	17
2	00:01:09	17	0
3	00:00:43	6	13
4	00:00:37	8	0

### Intro 1: How often do you use tracking apps/devices?

I don't use any tracking apps or devices

### Intro 2: On a scale of 1-10 how much do you care about the environment?

10.

### Task 1: Fill out the CO2 baseline survey

I don't understand the fuel question. How many times is electricity from lightbulbs supposed to count? The questions should be more specific to the house because sometimes one might think that the questions about heating may be about heating food and not necessarily the house. The questions should be easy to understand because this is an app to help people and the environment and not many people are fluent in English. The job of an engineer is to develop products of the greater good and must not be taken lightly.

### Task 2: Find which category you have the most CO2 emissions in

He didn't understand the question at first, but as soon as I repeated it, he found it straightforward.

Food, I think.

### Task 3: Track a purchase

When I write the name of the item, I was expecting a drop list with suggestions as I was writing.

The app is still in development and is not completely functional.

Understood

### Task 4: Find a tip and find your profile

The tip screen isn't clear enough. It needs just a few touches. The profile was easy to reach.

### General Exploration of the Prototype

The prototype functions were of easy access. The top bar in the home screen lacks aesthetics. The challenges part in the community seems like an advertisement.

### Likes

What I liked the most is the graphic in the home screen. I think that the most important thing about this app is to be able to see how much CO2 is emitted per person over time, so that we can see the evolution of our good habits.

### Drills

In the distribution bar, I would like to know the exact percentages of each category.

### User Test 3 (male, 22 years old, student)

*Italics* – My own comments noted as the test took place.

Regular – Direct quotes from the user.

**Bold** – Headers and titles.

Metrics

Task Number	Time (hh:mm:ss)	Clicks (including scrolls)	Typing clicks
1	00:06:27	1	didn't count (but didn't make mistakes)
2	00:00:10	0	
3	00:00:35	6	
4	00:00:22	2	

### Intro 1: How often do you use tracking apps/devices?

Never

### Intro 2: On a scale of 1-10 how much do you care about the environment?

9

### Task 1: Fill out the CO2 baseline survey

What makes low energy?

Not sure when the house was built.  
The fuel selection is not specified for house, he thought it could also be car fuel, for example.

How many times does he use the fuel? Shouldn't it be "how often"?

### Task 2: Find which category you have the most CO2 emissions in

Intuitively said food (correctly), but not sure of the answer. Didn't know if the bar represented 100% of the emissions or if the bars where superposed.

No comments on the image.

### Task 3: Track a purchase

Very easy and intuitive. Expected to open the menu to choose country (not implemented yet, but it was the correct position).

### Task 4: Find a tip and find your profile

Easy to find the tips, a bit difficult to read the yellow tips, but the colour scheme is appealing overall.

Profile was also easy to find and edit.

**User Test 1 (female, 20 years old, student)**

*Italics* – My own comments noted as the test took place.  
 Regular – Direct quotes from the user.  
**Bold** – Headers and titles.

**Metrics**

Task Number	Time (hh:mm:ss)	Clicks (including scrolls)	Typing clicks
1	00:03:45	21	7
2	00:00:46	0	0
3	00:00:38	8	17
4	00:00:09	2	0

**Intro 1: How often do you use tracking apps/devices?**

Maybe once a month, not very often

**Intro 2: On a scale of 1-10 how much do you care about the environment?**

8

**Task 1: Fill out the CO2 baseline survey**

The first screen is very accessible, I normally have trouble seeing up close and I can read everything perfectly.

*Doesn't know the year of built of the house at the top of the head, takes a bit to think about it.*

*Questions whether we mean rooms to sleep in or total rooms.*

*There is a missing space in the fuel question, the fuel names are too technical, the user struggles to relate them to the terms she normally uses (might be a language gap thing)*

*Final Comments?* The questions should be a little clearer, specially the fuel types one. Maybe a little question mark icon if the person doesn't know what a fuel is.

**Task 2: Find which category you have the most CO2 emissions in**

*The user quickly finds the Distribution section and starts to list off what she thinks the icons for categories mean, food and transportation are straight forward, shopping not so much. Daily life things maybe?*

*Easily finds the biggest category is food.*

*Final Comments?* The distribution was easy to find, and the housecat metaphor is cute. This a very pleasing design by the way.

**Task 3: Track a purchase**

*Intuitively finds the plus sign and the shopping icon, after being told to track a purchase the meaning of the shopping cart seems obvious.*

**Task 4: Find a tip and find your profile**

*Finds the tip easily.*

*Finds the profile easily.* The design is very pleasing and the badges are cute.

The smaller text on the tips page is a little hard to read, specially over the yellow background, I have to squint, maybe make it like Tinder so the text can be bigger. Suggestion of using horizontally swappable cards that appear one at a time.

**General Exploration of the Prototype**

Very interactive I like it!

[on profile page] I wonder if I can [clicks edit profile] ah yes very cool!

You can scan food? That's really useful!

**Likes**

I like that it's very personalized, I can add a lot of different things.

When I read that it was a CO2 tracker I thought it was going to be basic and only focus one category of emissions, but this one has everything that's relevant!

**Dislikes**

The distribution was a little unclear, I wasn't sure if the one with the most emissions was the biggest bar or the right-most bar. User says that the appearance of the visualization might indicate 3 superposed bars, going from largest to smallest from left to right.

**Final Comments**

I like the cat!

**User Test 2 (female, 22 years old, student)**

*Italics* – My own comments noted as the test took place.  
 Regular – Direct quotes from the user.

**Bold** – Headers and titles.

**Metrics**

Task Number	Time (hh:mm:ss)	Clicks (including scrolls)	Typing clicks
1	00:04:20	28	15
2	00:00:40	0	0
3	00:00:32	7	7
4	00:00:12	2	2

**Intro 1: How often do you use tracking apps/devices?**

I use one, an expense tracker.

**Intro 2: On a scale of 1-10 how much do you care about the environment?**

7.

**Task 1: Fill out the CO2 baseline survey**

It's a quick questionnaire, that's good, generally these kind of questionnaire take a long time. The question "When was your property built?" can be a little difficult to answer.

**Task 2: Find which category you have the most CO2 emissions in**

Transportation, maybe.

**Task 3: Track a purchase**

*She didn't have any difficult and achieves the result quickly.*

**Task 4: Find a tip and find your profile**

It was easy to find, everything is intuitive.

**General Exploration of the Prototype**

The design is cool and I think that everyone can use easily.

**Likes**

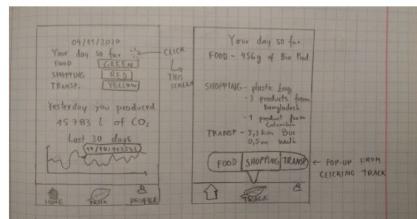
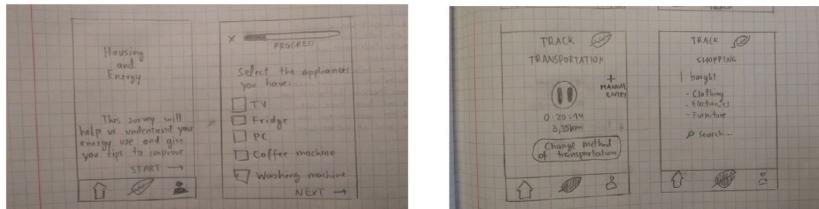
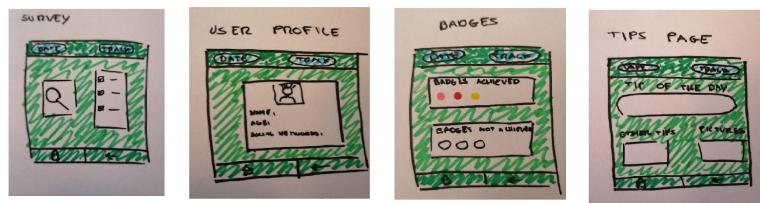
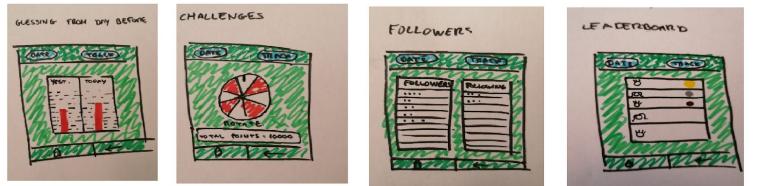
I think it is a good initiative because CO2 emissions is one of the greatest problems of modern world and it's good to know that there are people who care about it.

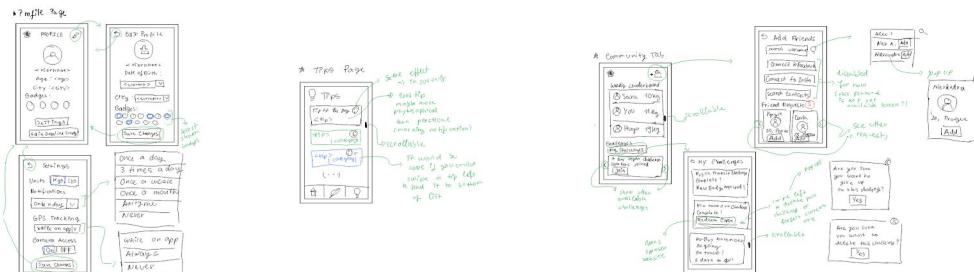
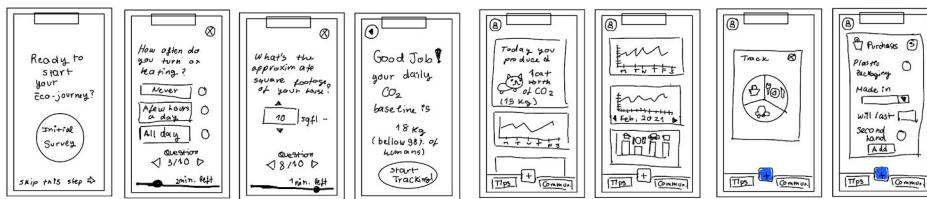
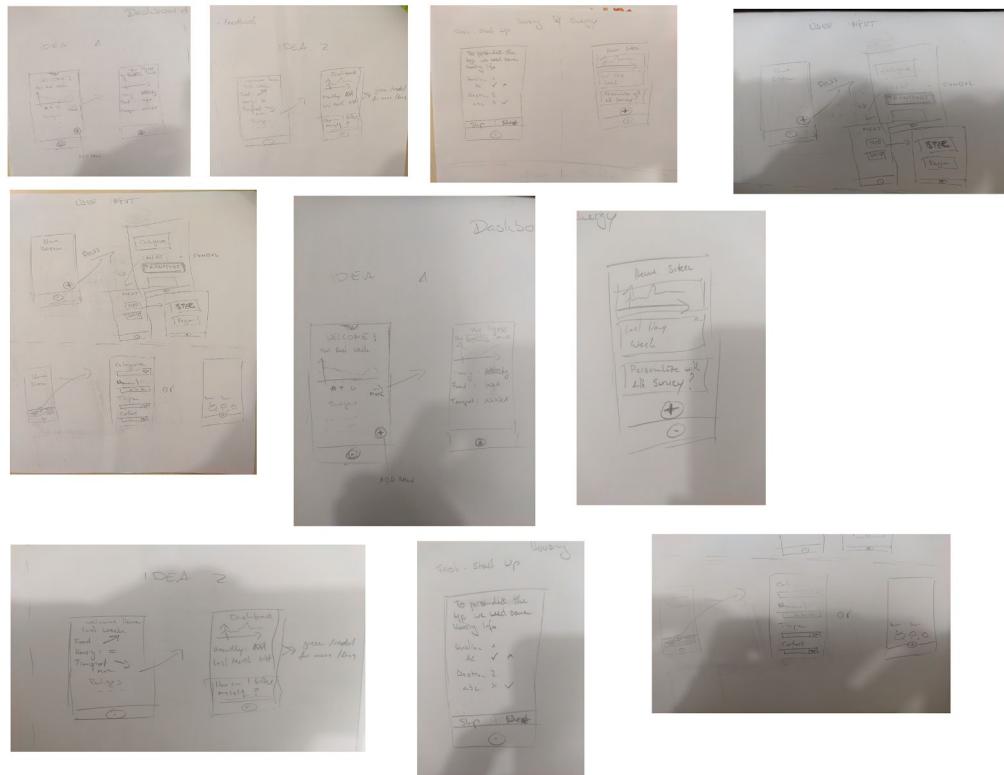
**Dislikes**

The tip of the day should have more emphasis.

# Sketches

The following images are our first sketches, for the low fidelity prototype.





# Comparative Analysis

## Carbon footprint & CO2 tracker

- +5k downloads
- 3.9 Google Play rating
- Global warming algorithm
- Baseline questionnaire
- Meat and Travel
- Manual Tracking
- Offsetting and Donating
- Teams
- News and Eco tips

## Ellie

- 500 downloads
- 4.5 Google Play rating
- Carbon offsetting
- Manual Tracking

## CO2 Cards

- +10k downloads
- 4.5 Google Play rating
- Gamification
- Rewards in cryptocurrency
- Trade cards with friends

# Thank You.

For more information on this  
project please visit

[https://kuerbisatom.github.io  
/6geeks/](https://kuerbisatom.github.io/6geeks/)



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