



FBP REPORT

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SUMMARY

Community Makers is a platform that has as a goal to grow, strengthen and connect communities of people who are actively improving their environments. They can use the app to start projects and find collaborators, both in their own social media network and in their physical neighbourhood. The app helps manage the project with a shared task list and asks project members to take pictures throughout the process regularly. From these pictures, it creates a time-lapse video of the project being built up from the ground. Providing a nice memento that can also be shared to inspire others. This video is an important feature as it both helps strengthen intrinsic motivators such as pride and sense of accomplishment and contributes towards getting even more people enthusiastic about improving their neighbourhoods.

This is how the app works on a small scale. However, the goal is also to connect communities, however far apart they may be. That's why, next to browsing projects near you that you could possibly join, you can also see projects that are being done all over the world, and even import them, including all tasks and notes, so that valuable knowledge and experience, but can be built upon by the whole community of makers.

I've done this project in the context of High Tech Campus Garden, a community garden initiative by and

for employees of High Tech Campus. This is a great example of people actively trying to improve their environment, in this case their workplace.

Although the garden attracted many potential collaborators at first, the initiators found they weren't able to retain and find new members as well as they would have liked further along in the process. They had difficulty generating content for their social media channels and generally wanted some more people thinking about and taking initiative towards projects in the garden. By using this platform in combination with their existing social media channels, such as the High Tech Campus Facebook group, I think it could help them out with finding, motivating and retaining new members for their community, because the app can lower the threshold and spread the workload of both maintaining the garden and maintaining the community.

Another potential use case relates to the Dutch government and municipalities. One of the main goals of our govern-

ment is to move from a welfare state to a so called participatory society. This entails that people take responsibility for their own lives and environments. There is a greater focus on citizen initiatives and networks rather than institutions pick up tasks and responsibility, preferably even in collaboration with municipalities.

Community Makers can help reach this ideal as it empowers citizens to start their own projects and take responsibility for their environments. A great opportunity in my opinion would be to work with municipalities and give them a voice on the platform. By involving them the process of doing projects in public space can be smoothed considerably making the threshold for citizens significantly lower.



TABLE OF CONTENTS

Summary	2
Table of contents	3
introduction	4
Client	6
Design Goal	8
target group	9
Concept Development	10
<i>First concepts</i>	10
<i>Gamification</i>	12
<i>Final concept</i>	15
product Development	16
<i>First prototype</i>	16
<i>User test</i>	18
<i>Second prototype</i>	20
Validation	22
Realisation	24
Business & Entrepreneurship	26
<i>Competitors</i>	26
<i>Customers</i>	27
<i>Business model canvas</i>	28
<i>Risks</i>	29
<i>Funding</i>	30
Presentation	31
Conclusions	33
Recommendations	33
Acknowledgements	34
References	34
Appendix A – Questionnaires target group	35
Appendix B – First prototype	36
Appendix C – User test Questionnaire	52
Appendix D – Changes prototype 1 to 2	56
Appendix E – Second prototype	81
Appendix F – Feedback Stefan Pfundtner	82
Appendix G – Code processing sketch	83
Appendix H – Video	87



INTRODUCTION

This report will describe the design process behind Community Makers, a platform where people can start projects to improve their neighbourhoods and find collaborators. The project was primarily done in the context of community gardens, but the final product can be used for any kind of collaborative physical project.

In this section of the report I will give some more insight in the theoretical framework related to the project. I will give some important benefits of community projects, as well as common challenges. Finally, I will relate this to some articles about the process the Dutch government is making towards a participatory society.

Community gardens benefit neighbourhoods in several ways. Some benefits include: improved social networks and organizational capacity in the communities in which they were located; increased neighbourhood pride and aesthetic maintenance of neighbourhoods; health promotion by improving local, sustainable food systems, addressing problems of depression and other mental health issues and addressing the need for green spaces and aesthetics; lowering crime in urban neighbourhoods; improving job skills and employment opportunities for participants; increased property values (Armstrong, 2000)

Most of these benefits also apply to other community citizen initiated projects. People taking control over their own environment can have great results, because it gives people

a sense of control and ownership over their own neighbourhood, making them feel more responsible for it and the people in it.

In the 'Inspiratiegids voor lokaal beleid preventie, zelfregie en participatie met kunst en cultuur in het sociaal domein' (inspiration guide for local governance of prevention, self-regulation, participation with art and culture in the social domain) by LKCA, current municipal challenges of the participatory society are explained, as well as how art and culture projects can help with them. They describe the transition to a participatory as: 'a transition to a society where citizens and their initiatives form the starting point, a society that is interactive, where individuals aren't just provided with information but also provide it, and a society where networks rather than institutions take



Figure 1: Vegetables from Proeftuin Meerhoven.

over tasks and responsibilities or tackle them in collaboration with the government.'

They saw several important benefits of participatory art projects. One of them was prevention or delay of health care as these projects increased the mental or physical health of participants. Another benefit was that stronger communities emerged, and individuals were able to find their strengths, build skills and networks and look past their boundaries and limitations. Finally, people were able to find meaning in doing these projects.

These benefits fit perfectly in the goals of a participatory society and are comparable if not identical to the benefits gained from projects such as community gardens and other citizen initiated projects for improving neighbourhoods.

It is clear that participatory projects work. However, an article by Movisie (2017) shows that in 2016, 81% of the Dutch population had never taken part in a citizen initiative, and that the people who start initiatives are mostly highly educated native Dutch people. They are better equipped to arrange things like funding and are generally more able to find their way to the necessary help and permits from municipalities.

The question at hand is therefore: how can we stimulate people in all levels of society to organise and take part in these types of projects in their communities?



Participatory projects strengthen communities and empower individuals

CLIENT

Before starting, I was planning to do this project in the context of my student team, VIRTUe. We are designing a sustainable house for the Solar Decathlon Middle East competition which will be built later this year. Part of the design is an urban farm that is shared within an apartment complex. However, the design of the farm was still very open and taking this case would mean I would have to design the urban farm from scratch for this very specific situation, giving me a quite low level of abstraction and transmissibility. My coach therefore suggested I find an additional client that already has a specific farm I can design for.

At first, I found the idea of finding a client quite haunting. I had never worked with an external partner before, and felt this might constrain my design freedom. In the past, my projects have always been very open, with very little constraints or even requirements and preferences. I did however feel it was important to step out of my comfort zone, so I started contacting some potential clients.

I contacted several community gardens in the neighbourhood, like High Tech Campus Garden and Proeftuin Meerhoven. In addition, I contacted some more high-level organisations who aim to facilitate and stimulate

urban farming initiatives. For example: Proeftuin 040 and Stadtse Boreen. I've got responses from some, two of which were open to collaborating.

I first visited High Tech Campus Garden, a community garden initiative by and for employees of High Tech Campus. They were very enthusiastic and had clear problems that could be tackled through design, like a lack of participation even though there was a lot of initial interest. They were also very open to implementing new technologies in their garden if necessary.



Figure 2: People at work in High Tech Campus Garden. Copyright High Tech Campus



Figure 3: Crop growing in an urban farm

The other garden I visited was Proeftuin Meerhoven, which is a very well-organised community farm in the residential area Meerhoven. I met with the farm-leader, Leo Bakx, who also runs Aardwerk, an organisation that educates groups of people to help them with urban farming initiatives. He was able to give me a lot of information about the organisation of this successful community farm, as well as the more technical aspects of running a farm. This farm posed less of an immediate design question. The farm seemed well ran, probably due to a professional actively taking part, and although they are always

looking for more participants, they also did not have any big problems in that department.

Leo also told me about the community garden at our university, and mentioned they were experiencing problems very similar to those of HTC Garden. This is not entirely surprising, as they are in a similar situation: relatively new organisations in working environments without one clear leader.

I ended up continuing to work with HTC Garden, as I saw most opportunity there, and was able to work

for people who are enthusiastic about and open to changes. Through the network of my contact, Stefan Pfundtner, I would also be able to gather information about my target group and find participants for user tests.

Working with a client turned out to be the best thing I could possibly have done. Instead of limiting me, it focused me to solve real-life problems and helped me direct my design process. Also it gave me access to resources and a network I would otherwise not have been able to profit from..

DESIGN GOAL

With my client in place the next step was to formulate my design goal. In my first attempts at formulating a goal, I noticed I was trying to solve every single problem they had. I got feedback to try and narrow down the goal as much as possible.

My first goal existed out of 5 parts:

1. Motivate people to contribute to a shared urban farm
2. Educate people about sustainability—aspects of food production and reconnect them to the food production process
3. Help people to complete farming tasks in the right way at the right moment
4. Connect people using the inherent cycle of farming

From analysing the actual problems at the garden and distilling what the clients goal for the garden really was, I managed to bring the goal down to the following:

Growing and strengthening the community of people involved in HTC Garden.

In this case, 'people involved in HTC Garden' wouldn't necessarily have to be getting their hands dirty, it could also just be people enjoying the environment in their lunch break and picking a berry to eat every now and then, or people organising or coming to social gatherings or workshops in the garden.

During the design process, I came upon a solution that is more widely applicable than just in HTC garden. The final design goal is therefore to grow, strengthen and connect communities of makers. The goal specific to HTC garden is of course also covered within this larger goal.



*Grow, strengthen
and connect
communities of
makers*

TARGET GROUP

The target group of my design is any employee of High Tech Campus in the context of my client. In the larger context, the target group is extremely broad and could really be almost anyone, although the focus is on the group of adult citizens who have an intrinsic motivation to be part of a community or take part in community projects. People who have no wish to take part in them should not have to, and should not feel that they are supposed to.

As a starting point for my design, I wanted to find out what factors are important in someone's choice to be part of a community farm or not. I wanted to know what motivates people who are part of one, and what stops people who are not.

To gather this information, I made two online questionnaires. One was aimed at people who were involved in a community gardening initiative and the other was aimed at people who were not currently involved in a community farming project. The focus of both questionnaires was to find out the motivations of people to be part

of such a community or not. I spread this questionnaire in my own network as well as the network of my client. The questionnaires can be found in appendix A.

The results of these questionnaires were that about 50% of the people were interested in joining a garden initiative. The main reasons to (potentially) join were cultivating and eating fresh organic food and it being an outdoor, hands-on activity. The main reason not to join was the time investment associated with a community farm.

Since I did not have an extremely big response on my questionnaire, I wanted to support my results with literature. Here I found that members of a garden are most often found through the existing networks of the participants that are already active (Glover, Parry and Shinew, 2005), and that access to fresh food and enjoying nature indeed are important considerations for joining, as well as (mental) health benefits (Armstrong, 2000). Glover, Parry and Shinew (2005) also found sociability as one

of the main reasons for joining and especially continuing to be part of a community garden. Armstrong did not include sociability in her survey, which may have been the reason it did not turn up in her results.

The results from this research were in line with the observations of the client. The aim of the garden was to be a leisure activity for HTC Garden employees, allowing them to escape to nature in their breaks thus promoting a healthy workplace and new social connections. Their initial group of participants mostly came from their personal networks, but they weren't able to retain new members as well as they would have wanted. They partly attributed this problem to their inability to properly maintain social media channels, thus keeping the community interested by promoting the jobs to be done as well as the successes achieved.

CONCEPT DEVELOPMENT

In parallel with my questionnaires standing out I started developing my first concepts. In my initial ideation cycle I was still working with my very broad design question, and was not yet working with HTC garden.

FIRST CONCEPTS

My first idea was mostly aimed at the goal of educating people about food production, encouraging them to eat healthier and helping them farm correctly. My idea was to create an augmented flower bed that would provide the user with information on the nutrition value of a crop, information on the growth process, and

possible recipes and tips to reduce food waste. To help people farm correctly, there would be a troubleshooting option where they could find out what went wrong if a crop did not grow correctly.

There were a few problems with this idea: first of all, it was in danger of drowning the user in information. Augmented reality is often used on a phone screen, as it would be in this case, since the solution should be mobile and available to anyone who is part of the urban farm. The screen might appear cluttered and it might actually become quite hard to find

the information necessary. Also the information given was quite unrelated. If you are using a service to help you with the process of farming, you are probably not interested in that service telling you what to cook with that crop, especially not while you are standing in the farm trying to perform a task. These problems could of course easily be eliminated, but another more important problem came up when I found my client: this idea did not relate to the design goal that turned out to be most important to them: motivating people to come into the garden.

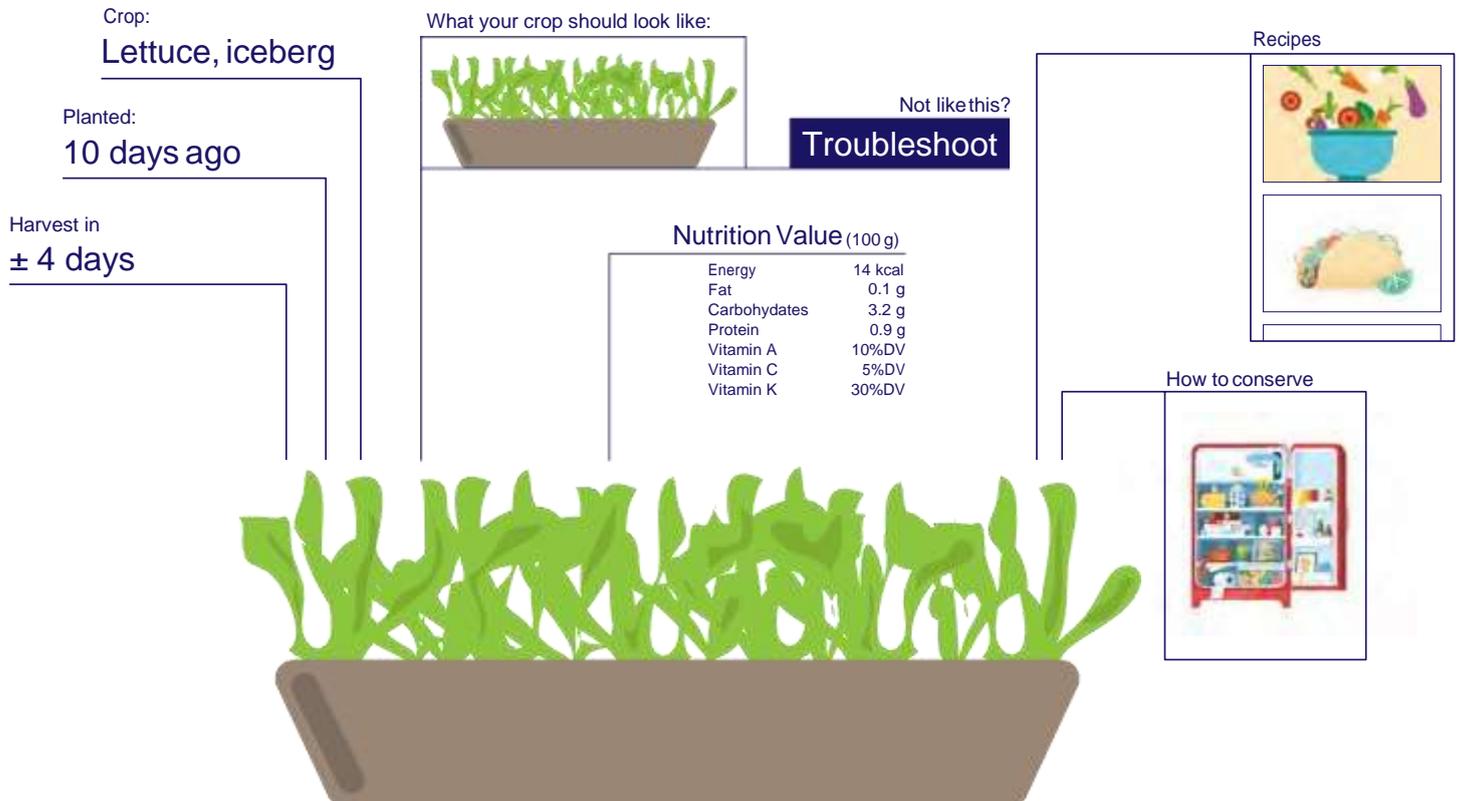


Figure 4: Visualisation of my first idea.

I continued brainstorming to see if I could use augmented reality to get people to come into the garden in the first place. I decided that as-screen based augmentation would not work for this, as you want to appeal to people who haven't even heard of the garden as well. So I thought about augmentations that could be applied in the physical world. Some of these included: projecting the growth history of the garden on the garden itself, or that of specific plants onto these plants; indicating routes with light; placing speakers in the garden that would play inviting sounds to make people curious and come looking for the source of it.

These ideas might work at first, however, they all depend on curiosity and therefore work only for a short time. They might get people into the garden once, but when they have seen the projection show, walked the light route or discovered where the sound comes from they would probably lose interest again. In order to also keep people interested, I started to explore gamification options.

Gamification

My first idea for gamification was very elaborate: apps where defining and doing tasks, organizing and attending events and taking photos and getting likes would earn you points. Points with which you could customize you own virtual garden gnome that others could see walking around the garden in augmented reality. QR codes in the garden would direct you to the app where you can see the gnomes walking around and proceed to make your own profile and gnome.





In relation to this idea and the use of gamification in general, I decide to do more research on the benefits and drawbacks of gamification. Although many papers report positive effects on motivation through gamification, some also found that focus on extrinsic motivators such as point and badge earning systems could weaken intrinsic motivation (Faiella and Ricciardi, 2005). Especially when intrinsic motivation is high, extrinsic motivators have the potential to demotivate (Glover, 2013). In the list of game mechanics by SCVNGR (Schonfeld, 2010), a developer of a mobile game with real-world challenges, this is referred to as the Moral Hazard of Game Play: 'The risk that by rewarding people manipulatively in a game you remove the actual moral value of the action and replace it with an ersatz game-based reward. The risk that by providing too many incentives to take an action,

the incentive of actually enjoying the action taken is lost. The corollary to this is that if the points or rewards are taken away, then the person loses all motivation to take the (initially fun on its own) action.'

This was an important consideration in how to choose game mechanics. I let go of the point earning system and avatar, as these were motivators that had little to do with the actual activity, and were the ultimate examples of extrinsic motivators. I wanted my design to foster and amplify the intrinsic motivations that the target group already has, as was evident from the initial interest in High Tech Campus Garden as well as my questionnaire and literature review.

Game mechanics for gamification are often derived from video games. In the aforementioned list of 47 game mechanics and explanations of their nature by SCVNGR (Schonfeld, 2010) I highlighted the mechanics which relied on intrinsic motivation and the ones that promoted inclusion of new players, which then became the set of game mechanics I continued to work with.

*Too many
extrinsic motivators
may cause
demotivation*

The motivators are::



Achievement – a representation of an accomplishments. Strengthens the intrinsic motivator of the feeling of having achieved something.



Behavioural momentum – the tendency to continue doing something once you have started. The more time you put in to something, the more meaningful it becomes.



Envy – the desire to have what others have. Seeing what other people are doing is essential for this mechanic to work.



Epic meaning – the idea that you are working towards something bigger than yourself.



Pride – the feeling of ownership and joy at an accomplishment



Ownership – the feeling that something is yours.



Progression dynamic – a dynamic in which success is granularly displayed and measured through the process of completing tasks.

The mechanics for including new players are:

Communal discovery – the dynamic where an entire community is rallied together to solve a problem.



Social fabric of games – the idea that people like one another better after they've played games with them, have a higher level of trust and a great willingness to work together.



Viral game mechanics – a game element that requires multiple people to play or works better with multiple people.



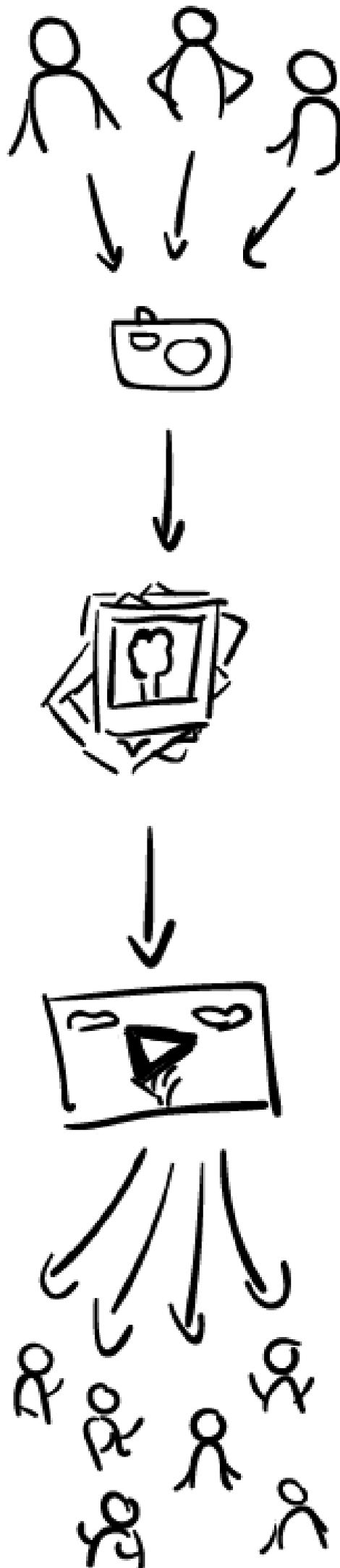
- CONCEPT DEVELOPMENT

FINAL CONCEPT

With the help of these mechanics I came up with the initial idea for the final product together with Jun Hu, my project coach. The general idea started out as people having to work together to document a process. Every day, an individual in a group of people would take a picture of a process or project happening. These pictures would then be put together in a time-lapse video of a process happening. This process could be anything, although initially it was envisioned as a growing process of a crop.

This idea already covers most of the game mechanics. The video functions as an achievement, is a visualisation of progression and can amplify pride as it is something that can be shown to others. Viewing a video done by someone else can elicit envy, motivating you to start your own project. Taking pictures every day creates a behavioural momentum, and can result in a sense of ownership. Sharing the task of taking photos does not only decrease the workload on a single person, but the social fabric of games also comes into play and a sense of responsibility might be created as the task is not just important for an individual, but the work affects the final result of the group.

I made the decision to expand the service with project pages, task lists and profiles, because I wanted to develop a more complete service, that would also allow people to look for collaborators in their own networks



as well as in their neighbourhoods. In order to look for collaborators there has to be some kind of representation of the project you are going to do, in this case the project page, that can be shared and viewed by other people, who can then decide to join or not. The task list was a logical consequence, as it provides more information about the project, and can help coordinate the tasks that need to be done. I did consider whether it was necessary to have this functionality in the app, as there are many other good apps for shared task lists. The reason to keep it in was mainly the fact that I wanted people to be able to view and import projects from anyone around the world, including their experience and knowledge. For this it was important that the task lists are transferable and therefore present in the app. The profiles are necessary because in order to be able to be part of and join projects, people need to be identifiable, both by the app and by others.

I considered adding a chat function to the app as well, so that teams could have their own group chats to talk about the project. I decided not to include this function, because I felt it was sufficiently covered by WhatsApp, Facebook chat and similar services and there was no real necessity to have it in the app like there was with the task list. Essential communications can be done through notifications in the app, and once people are in a project together, they can get access to each other's contact information.

PRODUCT DEVELOPMENT

FIRST PROTOTYPE

From this concept, I developed my first version of an application that would be home to the service described in the previous section. I used Adobe XD to draft an interface in the form of stills with all functionalities I thought the service needed to work. To decide on the look and

feel of the interface as well as the workflow I drew inspiration from other applications such as Facebook, Instagram, Peerby, Reminders and Contacts. I wanted the application to be easy to learn, so I tried using as many elements as possible that were either completely self-explanatory or commonly used in other applications.

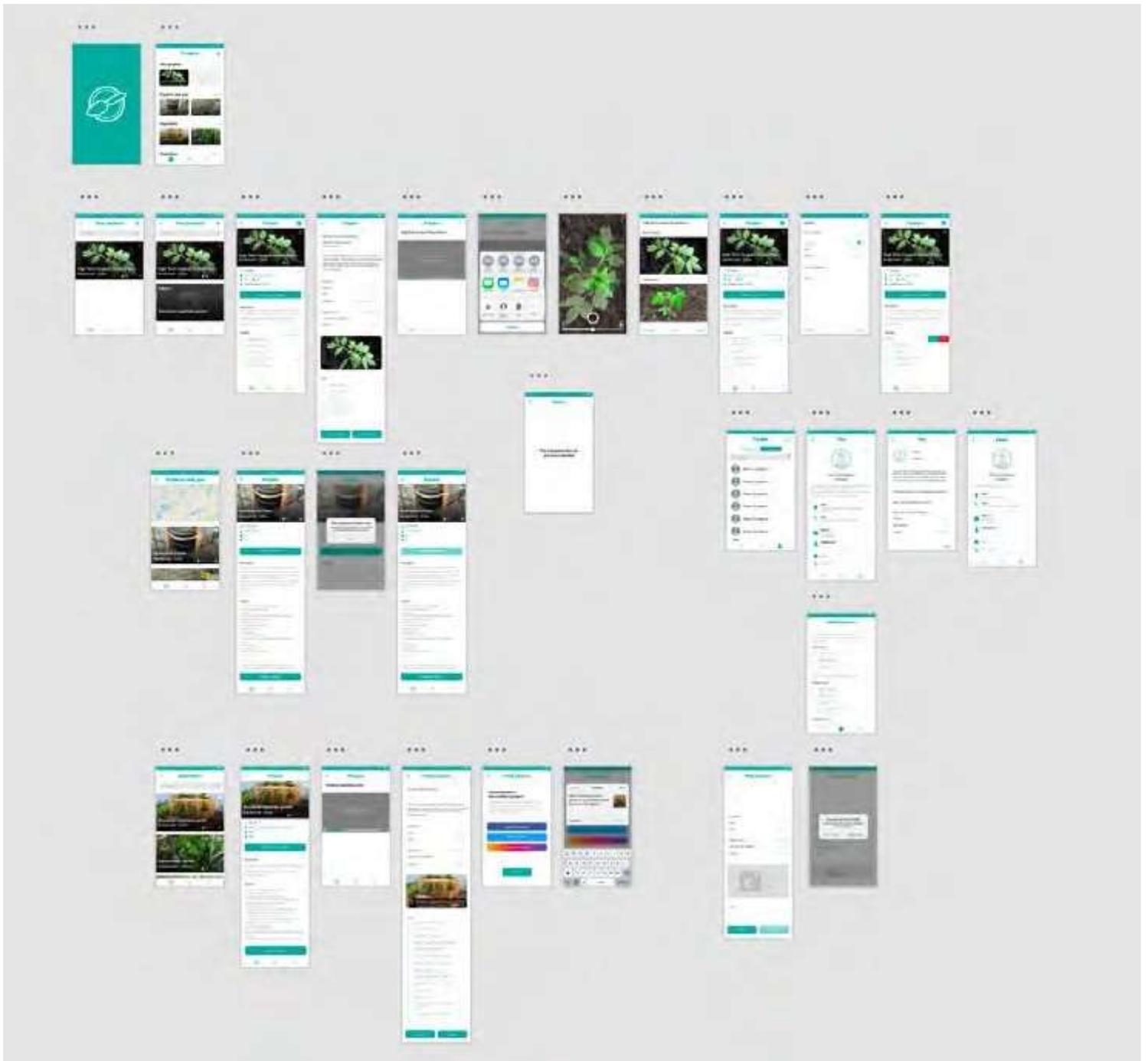


Figure 5: Overview of all screens in the first prototype.

This first prototype was meant for user testing so that I could improve upon the service and interface according to user feedback. Since I had a limited number of devices available, I decided to make a paper prototype of the app, so that I could test with multiple users at the same time. I printed the stills and labelled all interactive elements with the number of the page on which the destination still was located. See appendix B for the full prototype.

In hindsight, it might have been easier to make the prototype interactive in Adobe XD or inVision and publish it to a URL for test subjects to access. I wasn't fully aware of this option beforehand though and luckily the paper prototype also worked very well.

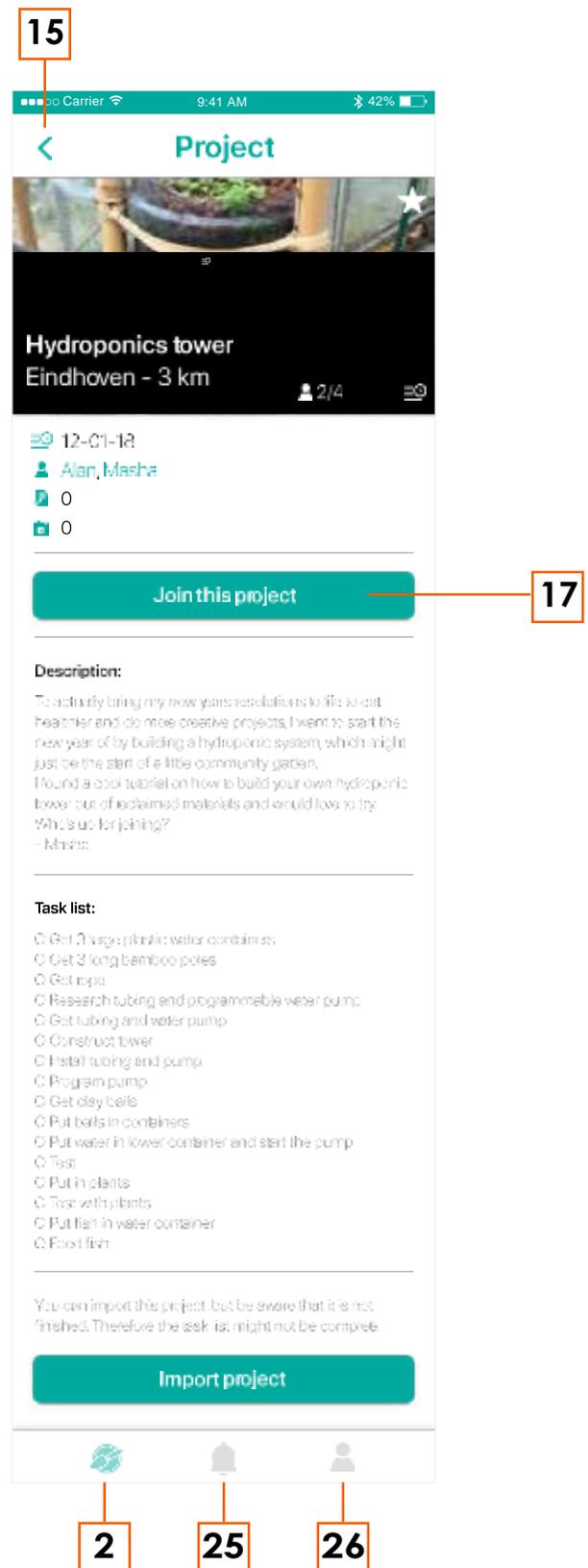


Figure 6: Example of a page from the paper prototype

USER TEST

My user test existed out of 3 parts. In section A, users had to try and complete 4 tasks on the app, documenting their steps until getting to the desired screen. They also rated the task on how easy or hard it was, how quick or slow and how fun or tedious. In section B, users got a list of all functionalities of the app/service. They had to indicate whether or not they could find this functionality and how important it was to them in this service on a scale from 1 to 10. They also had the opportunity to name any functionalities they felt were still missing. Finally, section C asked for general feedback and remarks on the app and the service. You can find the full questionnaire in appendix C.

I conducted my user test at High Tech Campus, in the garden. Some participants were present through invitation of my client, some were people that were just strolling through the campus that I asked to join and some were representatives of facilitating companies of HTC (The Colour Kitchen, yoga instructor). In total I had 9 participants, 4 of which worked in pairs, so a total of 7 responses. Considering the length of the user test (about half an hour) I was quite pleased with this number.

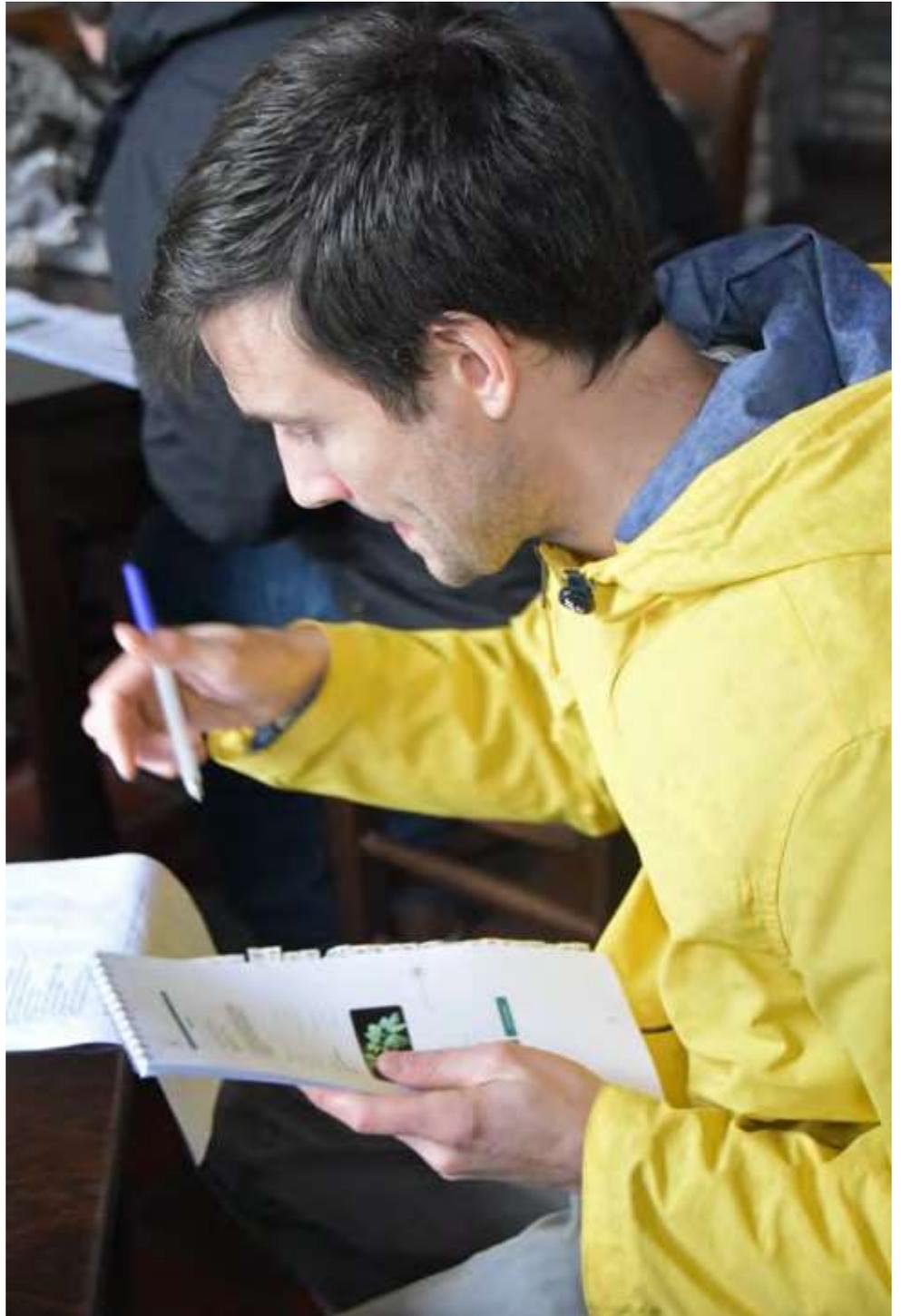


Figure 7: A participant of the user test is using the prototype and filling in the questionnaire.

From the test it turned out that the tasks were in general easy and quick to do and they were usually found to be neither fun nor tedious, or a little bit fun. Adding a photo was generally found to be the most fun task, but this might have been due to the fact that it was the first, so the experience was still very new. Section A therefore did not yield any results that needed much attention.

Section B gave me better insight in what is important to users of the app and what isn't, as well as the usability of the app. Table 1 shows an over-

view of the results. I used these results to alter functionalities and parts of the interface. These changes and how they result from the test can be found in appendix D. Some important additions of functionalities that were suggested include: delete project, sharing to social media from more screens than just the project creation screen, video as project identifier instead of picture, add parameters like effort, difficulty, impact and cost.

The responses from section C were overall very positive. All participants liked the overall design of the app

as well as the overall concept. Some participants also suggested using the app for other projects outside of community gardens or even in education or companies. This prompted me to start exploring how the app might be applied to other community projects and on a larger scale to aiding the participatory society. None of the participants said they would not use the service, although one participant said she wasn't sure whether she would continue to use it over time.

Not found by	functionalities	grade per participant						average
		1	2	3	4	5	6	
3	Change opacity overlay		5	3		3	3	3,5
3	Set and view skills/tools		6	4			4	4,66666667
1	View project by person		8	3	4	7	5	5,4
4	Edit task details		5	8			6	6,33333333
1	Notifications page		8	5	5	9	5	6,4
2	Restrict who can see a project		8	4		7	7	6,5
2	Restrict who can join a project		8	4		8	7	6,75
3	Share project on social media	10	10	4		8	2	6,8
1	View profiles		5	7	8	8	6	6,8
	Export process video		10	7	6	7	6	7,2
1	Save a draft project		10	3		9	8	7,5
1	View inspirational projects	10	8	6		10	4	7,6
	Import project		10	6	8	8	7	7,8
2	Favourite projects		10	6		9	7	8
	Take process picture		10	8	7	9	7	8,2
1	View projects near you	10	10	6		7	8	8,2
1	Claim task		8	10		8	7	8,25
1	View process video		10	8		8	7	8,25
1	Show completed tasks		10	10	8	7	7	8,4
2	Add/edit task		10	8		9	7	8,5
2	View process video of other's		8	8		10	8	8,5
	Edit project		10	9	6	10	8	8,6
1	Join projects		10	10	7	8	9	8,8
1	Project task list		10	10		8	8	9
	Add new project		10	10	7	10	10	9,4

Table 1: Results of section B of the user test. One participant did not complete section B and is therefore left out of the analysis.

SECOND PROTOTYPE

With the insights from the user test, as well as some of my own, like the fact that the time lapse video was not present enough in the first prototype, I made a second version of the platform. This time I used Adobe XD to make the prototype interactive, so that the interface could be used like a real app, even though the app isn't actually functional. I considered using inVision to prototype the interactions instead, but was underwhelmed with the user experience of this

service. It is an online platform which unfortunately was quite slow and sometimes didn't respond altogether. It also didn't offer significantly more functionalities than Adobe XD already did. Another disadvantage was that in inVision you can't edit the design, so small changes in the are very difficult to make once you've started working in inVision, while Adobe XD offers an integrated design and prototyping experience.

All changes that occurred from the first prototype to the second, with argumentation can be found in appendix D. The final prototype can be found in appendix E.



Figure 8: Overview of all screens in the second prototype.

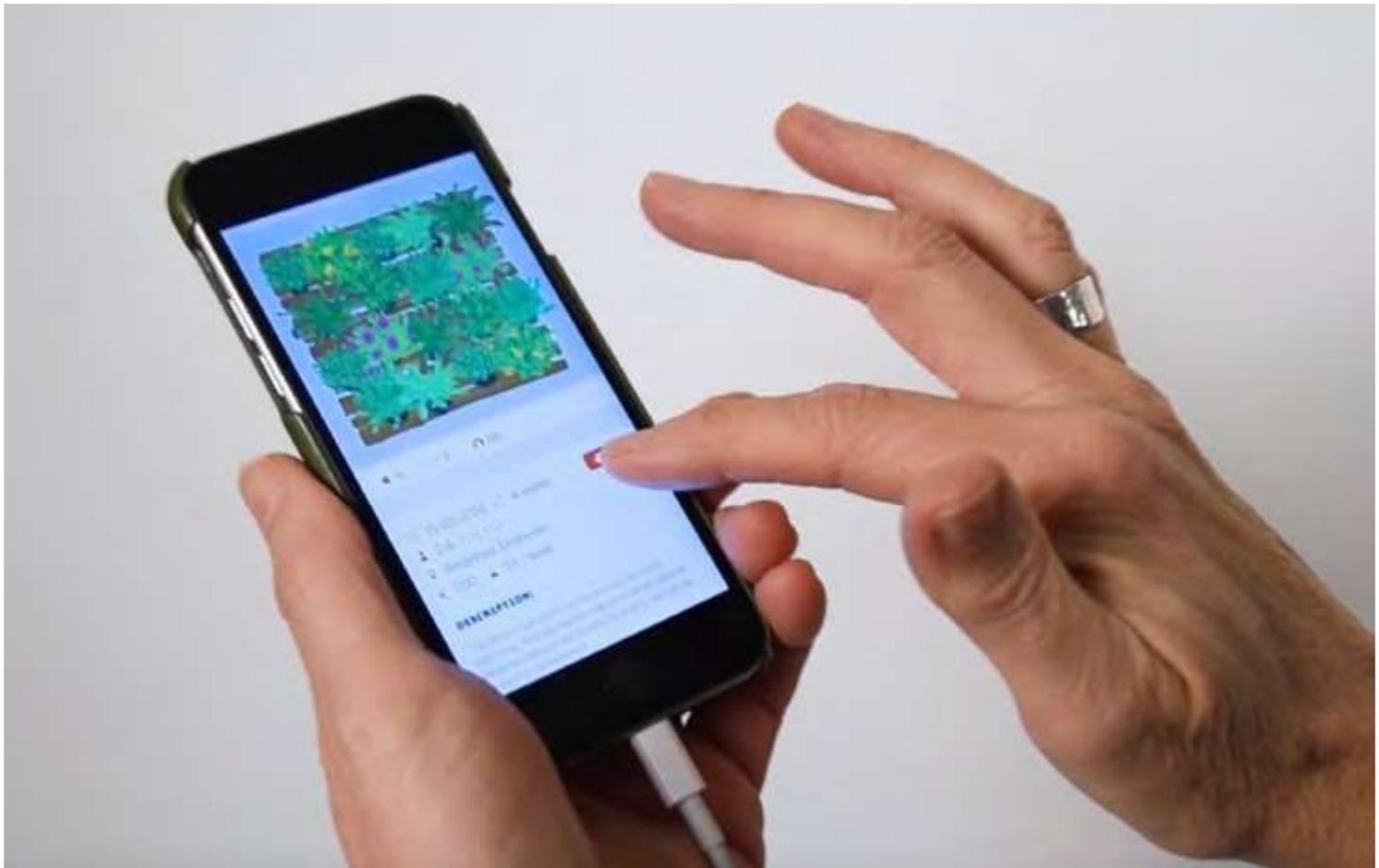
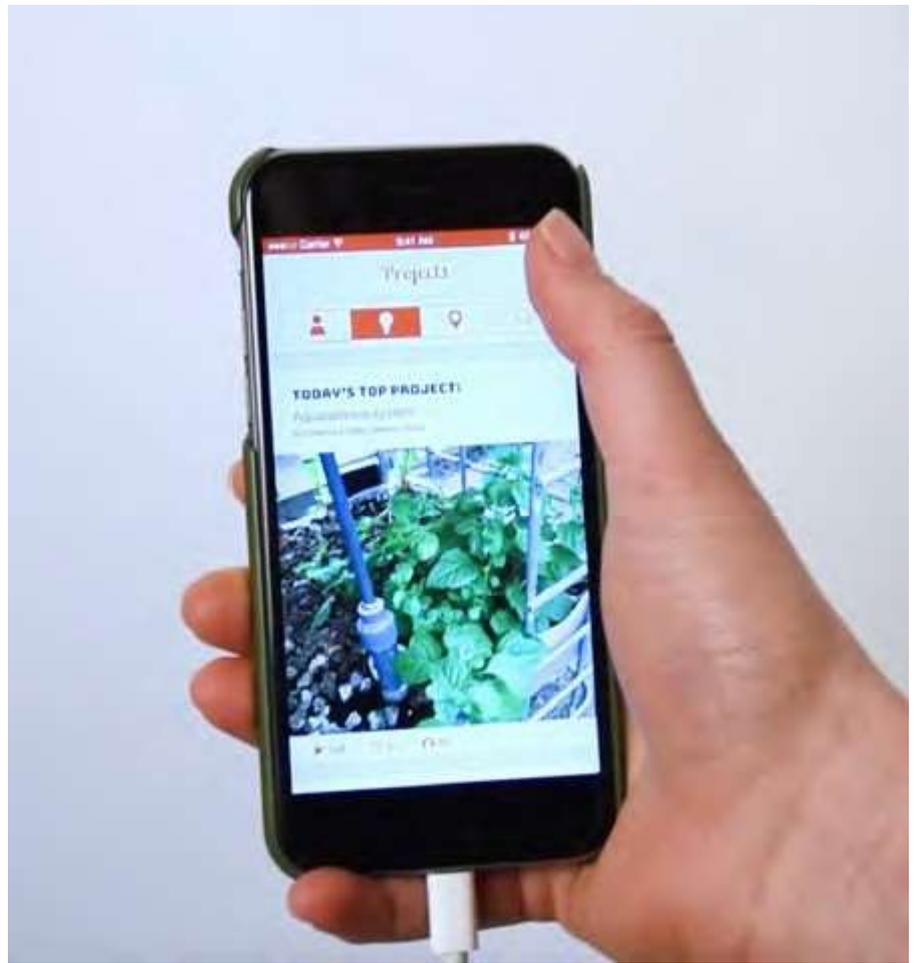


Figure 9: The prototype in use.

VALIDATION

As I was unable to make and launch a functional app within the time span of this project, I have not yet been able to test the platform in a real life situation. Therefore, I had to find validation of whether the service is probable to achieve the goal of growing, strengthening and connecting communities of makers in different ways. One of these forms of validation comes from the feedback of my client. Another comes from literature: I found some papers that relate more closely to the product I ended up designing rather than the theoretical framework I started from. Lastly, I found some validation in reactions from visitors of demo day.

My client was very enthusiastic about the final prototype. He was happy with the concept and could imagine how the app would work for community projects, both inside and outside of the garden. For the full feedback by Stephan Pfundthner (HTC Garden), see appendix F.

In literature I came across two relevant quotes:

‘Despite the promise of virtual networking, a clear message is that wider engagement will only ‘materialize’ if virtual connections also manifest themselves in real space through concrete actions and connections, and only if a range of both online and offline engagement tools is used in order to include both technologically-savvy citizens and the ‘slow adapters’. Continued engagement, offline and online, will only occur if the rewards accrue to residents in the ‘real world’, in the form of neighbourhood improvements, better services or events.’ (Kleinhans, Ham & Evans-Cowley, 2015)

About examples of initiatives that are being done in the same context as Community Makers, Haern et al. (2014) say: ‘although it is too soon to speculate what large scale systemic change is heralded, the examples discussed give evidence of commu-

nity level changes of some importance. Furthermore, although there will be churn in these new media innovations, we suggest that innovative multi-platform technical solutions may demonstrate longevity.’

From these quotes, I think that Community Makers definitely has a chance of working as envisioned. This because virtual connections do manifest themselves in real space, and the rewards are present in the real world and not just in the virtual realm. However, the app does not yet target the slow adapters of technology, which might be problematic in reaching weak members of society such as the elderly or mentally impaired. This is definitely an opportunity for improvement in order to make the platform more suitable for aiding the participatory society.

The second quote reinforces that the platform has a potential for community level changes and longevity.

“I see a lot of excellent use cases not only for gardening, but for any community project in the urban setting”

- Stephan Pfundthner (HTC Garden)

Finally I got some reactions from visitors of demo day that I think are worth mentioning in the context of validation. First of all, I spoke to three people who could see the platform being used in their own specific context. One offered to put me in contact with a housing corporation in Limburg, that does projects comparable to Space-S, where potential residents are involved in the planning process. This is a direction I had already considered taking the platform and I was therefore very pleased to find others independently reached this same conclusion. Someone else saw my service fit in a project by Schouwen-Duivenland, who are looking to start a network for cooperative projects between entrepreneurs, companies, citizens and municipalities, once again a direction I could imagine this project going in. Yet another person was interested in the app for a context that is much closer to the one I started from: namely a voedselbos (food forest) that will be laid out near Boxtel. She was interested in using this service to document the process and engage more participants, so basically what it is designed for in the first place. I also talked to several students and other visitors, and asked them whether they would use the platform. Most of them said they would, and if not, the reason mostly was that they were not interested in doing community projects at all, which places them outside of the target group of the service.



REALISATION

Unfortunately, I was not able to realise a working version of the app, due to my lack of experience with app development. Learning how to develop a working app would have been possible, but would have taken me a considerable amount of time. App development was also not part of my learning goals or my vision for my future. Therefore I decided to allocate this time in other parts of the process.

What I did do to toward realisation was to create a high-fidelity prototype (appendix E), in which almost all interactions were worked out, so as to give users the closest experience possible to the real thing. Unfortunately, I wasn't able to realise one of

the most significant parts in the prototyping tool, namely the functionality of taking pictures of which the app then creates a time lapse video. To be able to show this functionality anyway, I wrote a Processing sketch which mimics the app's interface and allows you to take pictures. These pictures will then be played back on the project page in a time lapse video like they would be on the actual app. For the full code of the processing sketch, see appendix G.

To help me with prototyping as well as possible future realisations, I also kept track of the functioning of the app in a descriptive model. This model represents the different flows of information in the service system.

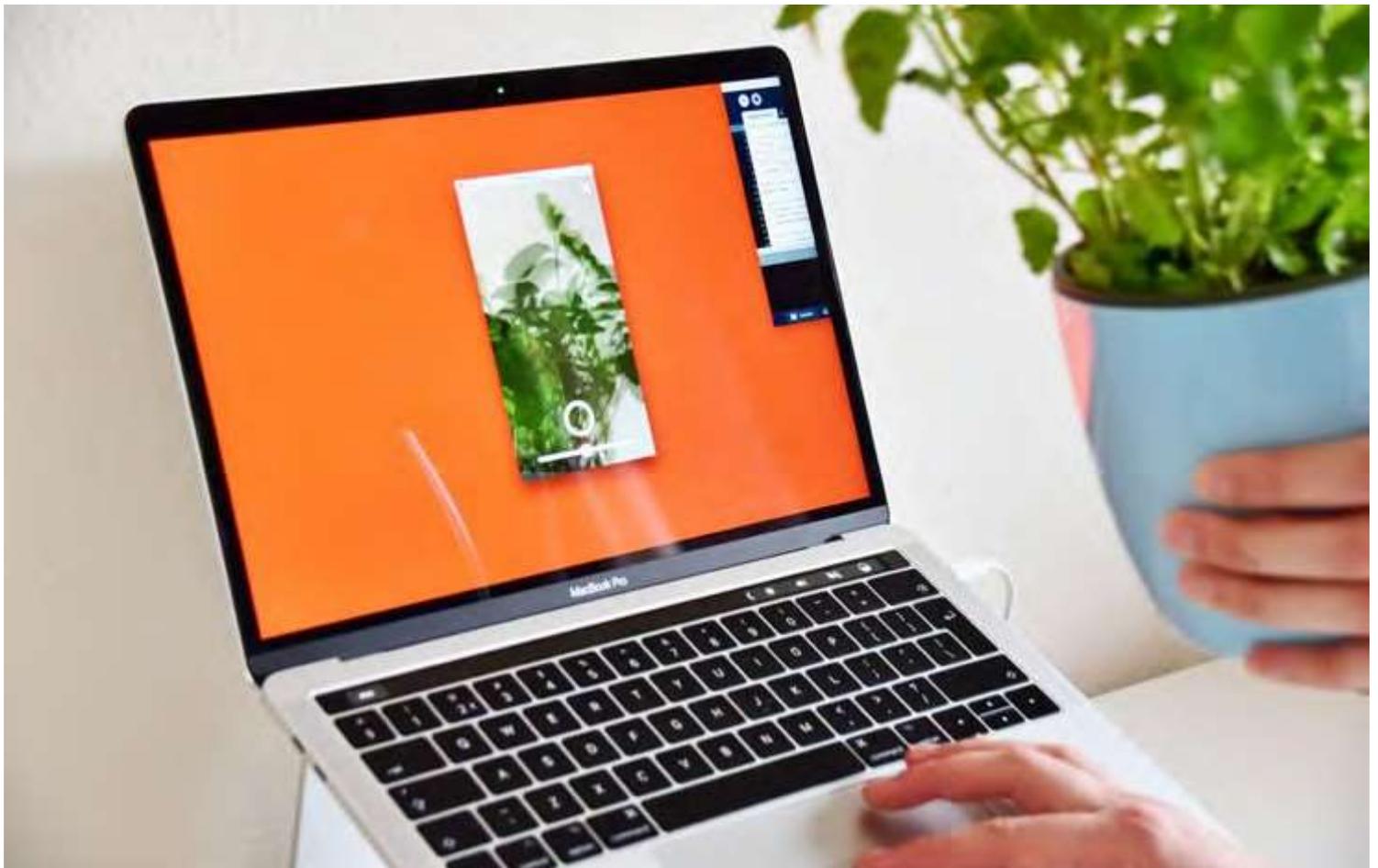
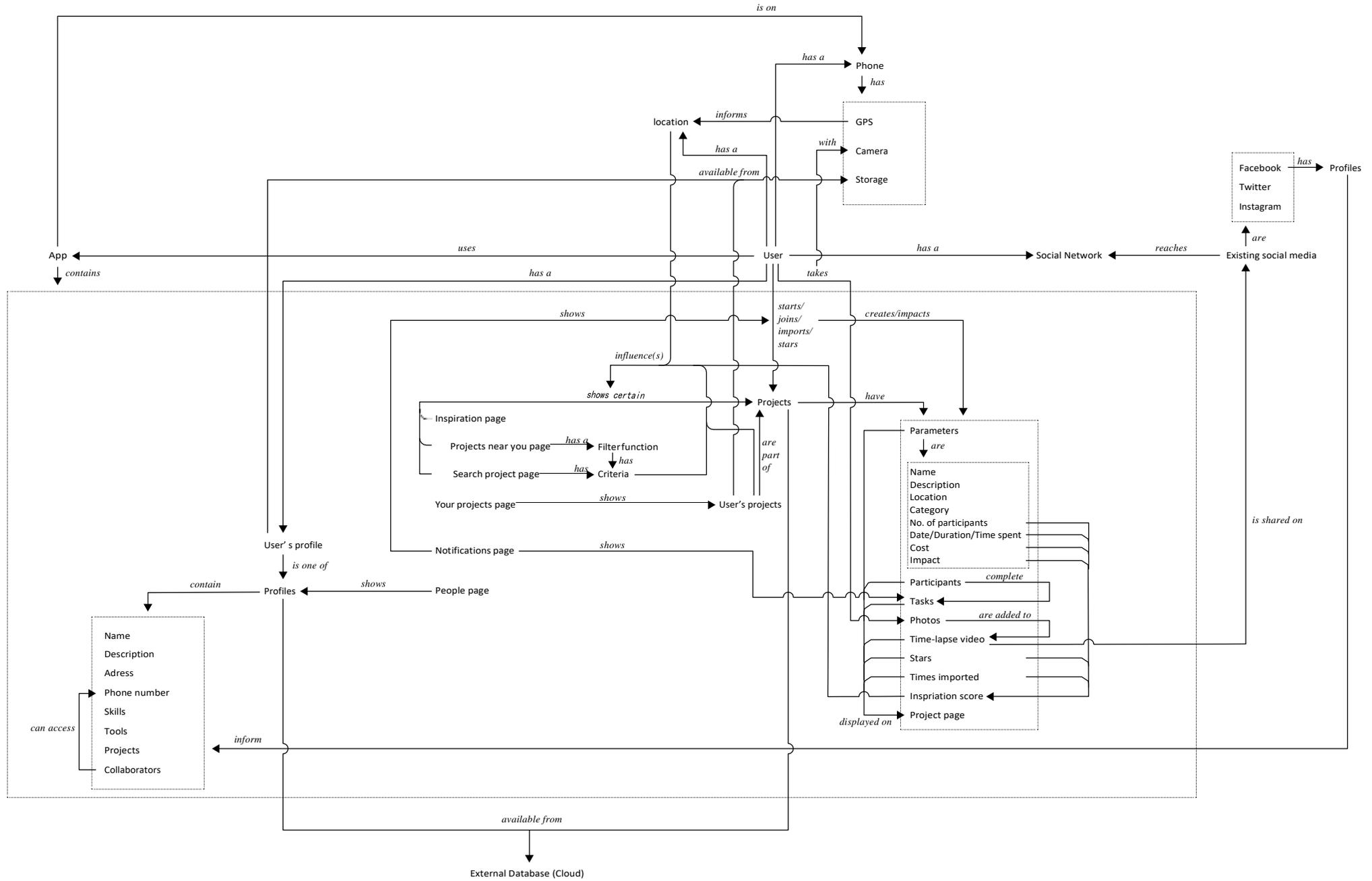


Figure 10: Taking pictures using the Processing sketch.

Figure 11: Descriptive model of the Community Makers platform.



BUSINESS & ENTREPRENEURSHIP

It was important to me to include a business perspective in this project as this was one of my learning tools. To help me create a business case for this project I used a tool that I first used when I participated in TU/e contest with my student team. This tool is called Golden Egg Check, and it is an online platform that helps you build a solid business case for emerging projects. Some of the elements have already come along in this report, like the target group and product description. In this section I will give some more insight in potential competitors, customers and risks. Also I will include a business model canvas. Finally, I will go into possible ways to continue the project, in the form of grants for which this project might be considered.

COMPETITORS

Here I will describe my most important competitors, as well as what advantage my product has over them.

Facebook: Gives the opportunity to form groups, also around specific activities. Powerful for communication as well as for sharing content. Community Makers differentiates because it is a lot more specific to the cause of doing community projects, and allows you to find people and projects easily unlike Facebook. Community Makers uses Facebook for its extensive network and communication tools by allowing users to share content generated by the app to Facebook.

Instagram/Pinterest: Both are powerful tools for sharing and finding content and inspiration. However, they do not offer functionalities to copy projects from others entirely. Also they don't have any project management functions.

Wunderlist/Trello/other shared to do apps. These give users the opportunity to have a shared to do list like in Community Makers and even allow other people to take over public lists. However, they do not have a documenting function like the picture function in Community Makers and again are not specified to commu-

nity projects, making it hard to find those projects you would like to do, let alone browse for inspiration. Also there is no opportunity to join to do lists you weren't invited to specifically.

Werkspot (werkspot.nl) gives independent entrepreneurs the opportunity to find small jobs. However, the focus here is on paid jobs and not on volunteer or leisure projects.

One of the closest competitors is Nextdoor, a neighbourhood platform for organising anything in the neighbourhood. This platform wants to help people build a better neighbourhood. The difference with Community Makers is that this platform is much broader, for example you can use it to find a babysitter, sell your child's old bike or find your escaped pet as well as find people to do projects with you. However, the focus is on connecting citizens in general, not necessarily on projects. The service does not contain shared task lists or a photo documentation functionality, and probably most importantly, it does not allow you to see what is happening outside of your own neighbourhood. So you cannot get inspiration from other neighbourhoods and apply their projects to your own.



CUSTOMERS

The customers I have described so far, have mainly been general users of the app: people who start and join project of their own account, in their community garden or their neighbourhood in general. The whole point of the Community Makers is to keep the threshold as low as possible for people to start and join projects, therefore I want the application to be free and free of ads.

In order to make this service a viable business opportunity, as well as to make it work better, I would like to develop it further to involve municipalities. I think it would add value to the user if the lines of communication to municipalities were shorter, so that they can easily negotiate permits and perhaps even grants, without having to go through long and difficult processes. This might even make the practice of community projects more inclusive, since now it's mainly highly educated people who make it through these processes.

For municipalities, it can also add value, as they are interested in stimulating citizen initiatives, as is prescribed by the participation law. Also, it might be interesting for them to know what initiatives are going on and use the generated videos for communication and promotion. Therefore, I would like to develop special accounts for municipalities in the future, in which they have access to well organised data and are able to contact initiators of projects in public space, as well as access videos created by citizens.

This service would be accessible through a paid plan.

This same functionality opens up another customer segment. Namely of housing companies like Trudo, who are trying to develop living spaces where community is an important aspect, like Space-S. They might want to continue to inspire residents to work together on projects. I spoke to a resident of Space-S, who told me all their communication channels were currently only used for remarks on noise or littering and little to no positive or community building related purposes. He mentioned he would definitely appreciate a service like Community Makers to bring back the positive vibe and he anticipated many others would too. Again, housing companies could use content generated by residents to promote their housing solutions.

Finally, there is also a potential to work with educators. I can imagine using the app might add to student projects, maybe motivating them more or opening them to new insights as they document their process. Employees of the Colour Kitchen expressed interest in using Community Makers with their students during the user test. However, in order to make this service really suitable for education, I think it would definitely need some redesign. Maybe this purpose is even not possible within the current platform, but it might be an opportunity for a future spin-off.



<p>KEY PARTNERS</p> <ul style="list-style-type: none"> ■ Software Developer ■ > develops application and later perhaps a web based application for use on PC's. ■ Municipality ■ > Can help provide funding and publicity. ■ > Can help to get the service used. ■ > Can be a player on the app to make the process of approving projects in the public space more easy for users of the app. ■ Citizens ■ > Will be the users of the app ■ > Will provide input in the form of project and sharable content through foto's ■ Organisers at community centers / community gardens / neighbourhood associations ■ > Perform the same roles as citizens ■ > Additionally can encourage people in their communities to use the service. 	<p>KEY ACTIVITIES</p> <ul style="list-style-type: none"> ■ Building and maintaining the app ■ Developing new functionalities specific to the needs of (potential) paying customers ■ Promoting the app to generate an initial user population (fans) ■ Gathering feedback from users for improving the app. 	<p>VALUE PROPOSITION</p> <ul style="list-style-type: none"> ■ Help finding collaborators for community projects ■ Generating sharable content ■ Help manage community projects ■ Help finding projects to join in neighbourhood ■ Promotion of community projects and citizen initiatives ■ Insight in community projects that are being done ■ Access to projects anywhere that can be recreated anywhere and by anyone 	<p>CUSTOMER RELATIONS</p> <ul style="list-style-type: none"> ■ Users of the app expect a working service. They should be able to give feedback and ask questions if they are unable to do something. ■ > A working app is most costly, about 10000-20000 euros, this is also the most essential though. ■ Municipalities, companies and educators would form the base of paying customers for this app They will expect to get benefits like ■ > improved insights in the activities in their domain ■ > More activity in their domain ■ > Access to data on specific users or groups of users ■ > Inclusion in the development process to suit their specific needs. 	<p>CUSTOMER SEGMENTS</p> <ul style="list-style-type: none"> ■ Citizens ■ Organisers at community centers / community gardens / neighbourhood associations ■ Municipalities ■ Housing companies such as Woonbedrijf ■ Governments ■ Educators
<p>COST STRUCTURE</p> <ul style="list-style-type: none"> ■ Development and maintenance of the app ■ Development of new functionalities ■ Promotion ■ publishing app on App Stores 		<p>REVENUE STREAMS</p> <ul style="list-style-type: none"> ■ Initially: subsidies from municipalities/ creative industry grants to get the product up and running and develop new functions for paying customers. ■ Later: Companies, municipalities, and educators pay for access to specific functionalities, such as access to data, ability to be part of projects, etc. ■ > Additional functionalities for users can also be added for users in the communities of paying customers ■ > monthly or yearly plans ■ > These revenues should help pay for further development of functionalities ■ Companies, municipalities and educators can also be promoters of the service. 		

RISKS

Some of the risks in the development of this business might be:

Insufficient initial funding. If I am not able to find funding for the development of this app, the app and therefore the business will not come to exist, or not with the functionalities I would have liked. To solve this, I will have to analyse why people are unwilling to invest in this service, and with this knowledge have to either go back to the drawing table, adjust my story, or decide the service has no future after all and let go of the project.

No traction with the target group. It could be that the app is launched but no one will use it. In this case I will have research why people are not using the service. The problem could be that the service does not actually add value, is not designed well enough to use consistently, misses critical functionalities or it could be that people just do not know about it. The first case would be the biggest problem, it could mean that the service is never going to work. I would then have to evaluate whether there is a way to alter the service so that it does add value. The next two cases are more easily remedied by redesigning parts of the app. In the last case I will have to try and find people who have a specific reason to use the app, like members of community gardens and see if I can create an initial user population in this way that can then slowly grow larger and larg-

er. All of these problems would have implications for the budget, adding significant extra costs.

No traction with companies. It could also occur that the app is popular with individual users, but organisations are not interested in paying for additional functionalities. In this case I will have to revisit the value propositions and see in what other way value could be added for organisations. Alternatively, I could decide not to target organisations, and just leave the app as a free service, meaning the app would probably not turn a profit. To raise money for maintenance of the app I could consider crowdfunding or a pay as you like system for users of the app.

Misuse of the app. The platform is meant for projects to improve a neighbourhood in some way. However, the app could also be used for organising and documenting other things. For example, families could use it to organise and document their home remodelling, or prospective parents could use it to document a pregnancy. These are examples of very innocent 'misuses' of the platform, but you could also imagine that people take inappropriate photos or start inappropriate projects. If this starts happening I will have to decide on a policy. Do I want to allow people to start projects that are not related to improving a neighbourhood, but that do fit in the format of the app? I personally would not mind the app being used for other purposes, but

it is important to consider how this affects the community, as it might change the demographic of the service, and the projects it was meant for might drown in others. I think that the fact that the projects are publicly visible does help prevent this problem. Alternatively, I could install a system where users of the app can flag projects that don't belong there, which can then be removed from the app.

FUNDING

I've looked into a few options for possible funding and found some programs Community Makers could potentially fit into.

Stichting DOEN finances projects that help create a greener, more social and more creative society. Community Makers fits well in their 'Nieuwe Ontmoetingsplekken' (new meeting spaces) program. This program looks for projects in which citizens play an active role, and that stimulates new social connections that might not occur spontaneously. (https://stimuleringsfonds.nl/nl/subsidies/deelregeling_digitale_cultuur/)

Stimuleringsfond Creatieve Industrie provides grants for projects in the creative industries. Community Makers would fit well in their 'digitale cultuur' (digital culture) program. Amongst others, it looks for projects that promote social engagement and public activities. (<https://www.doen.nl/wat-we-doen/sociaal/nieuwe-ontmoetingsplekken.htm>)

Several provinces have subsidies for 'leefbaarheid en sociale cohesie' (roughly translated: livability and social cohesion), for stimulating citizen initiatives. The most relevant of these is from the province of Gelderland, which is looking for projects that can help citizens start initiatives amongst others.

(<https://www.gelderland.nl/Leefbaarheid,-ondersteuning-van-bewonersinitiatieven-op-gebied-van-leefbaarheid-en-sociale-samenhang>)

Other possibilities for funding could come from potential clients like municipalities and housing companies as described under customers. For example through the contacts I got during demo day.

PRESENTATION

My demo day presentation existed out of 4 parts:

- The final prototype, displayed and usable on phone.
- The Processing sketch showing the photo/video functionality of the app displayed on a laptop
- A video explaining and showing the concept
- An A4 poster with a short explanation of the project and a QR code that allows visitors to experience the prototype on their own device.



Figure 12: Demo day set-up.

In general, visitors responded well to my set-up at demo day. I got positive reactions on the coherence and professionalism of the display as well as the pitch.

Although I have made product videos before, I was able to try some new techniques in this one. I shot video footage in front of a green screen and combined this with digital animation to show a project being build up. Without this I would not have been able to communicate my concept as well. I had never worked with green screen before and was pleased with the results considering my limited experience. For the video, see appendix H.



Figure 13: Setting up the film studio

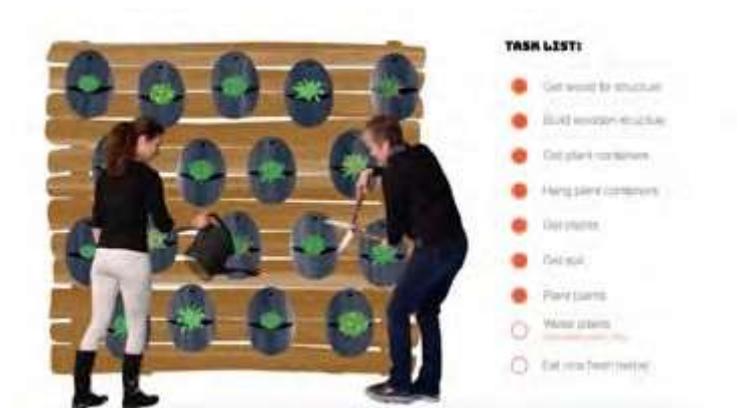


Figure 14: Stills from the final video.

CONCLUSIONS

Community Makers definitely has the potential to at least address the problem of the client, and can even grow beyond that to help stimulate community projects in general. In order to get definite conclusions on whether the product will work, it will need to be implemented and used in real life situations, starting with already running projects, and gradually continuing into projects with no real base of participants so far.

If the product does work, it will stimulate citizen initiatives and community projects. These can contribute to increased mental and physical health of citizens, stronger communities and more self-reliant and accomplished citizens. These are all consequences that can help progress the participatory society.

There are several possible business cases for Community Makers, although slight changes or additions will need to be applied to the service to realise them. This would have to be done in collaboration with potential clients. However, this can be done at a later stage, as the initial app can be launched for regular users with the help of subsidies.

RECOMMENDATIONS

The next steps associated with this project would be realisation and implementation. The results from this will then inform further refinement of the service. I think it is also important from this stage on to contact municipalities and companies to discuss with them what value they see in the project and how this value could be increased for them.

Also in further development of the service I think there is an important opportunity in finding a way to reach less technologically inclined citizens. It is important that especially these people can also be included in the network. It might be interesting to provide analogue tools that users of the app can spread in their own neighbourhoods. Something like automatically generated posters could already have the desired effect.

ACKNOWLEDGEMENTS

I would like to thank:

Jun Hu for coaching me throughout this project and giving valuable input for the final product.

Stefan Pfundtner for giving valuable feedback and for lending his network to help me gather information on my target group and organise user tests.

Leo Bakx for taking the time to give me so much information about community gardens and their organisation.

Inge Vlugter, Stephan Frank and Ayla van der Pasch for helping me shoot and starring in the video.

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APPENDIX A – QUESTIONNAIRES TARGET GROUP

QUESTIONNAIRES

A copy of the questionnaire for people who are currently part of a shared urban farm can be found here:

<https://docs.google.com/forms/d/1YsA-fEb0sMboZIIjm8CqsX0xIImlonlhYW-jKqChrABg/edit?usp=sharing>

A copy of the questionnaire for people who are not currently part of a shared urban farm can be found here:

<https://docs.google.com/forms/d/18y-WxhBKpY2IjoT-QvpgYdlaWCRhMXTsm-Mtm3eI2zdA/edit?usp=sharing>

RESULTS

I have not included the results of the questionnaire here to protect the privacy of the participants. If you do wish to view the results, please contact me at

I.v.beers@student.tue.nl.

APPENDIX B – FIRST PROTOTYPE

The first prototype starts on the next page.

Note: Not all photos used in the prototype are my own.

The picture of a young tomato plant was retrieved from <https://kiza.eu/art/image/869>.

The picture used for ‘Community Vegetable Bed’ is property of Buurttuin Breda.

The strawbale vegetable garden was retrieved from: <http://oldstreettown.com/wordpress/vijf-voordelen-en-een-nadeel-van-tuinieren-op-strobalen/>

The second picture of a young tomato plant is also not mine. Unfortunately I was unable to find the owner to credit them properly.

PROTOTYPE #1

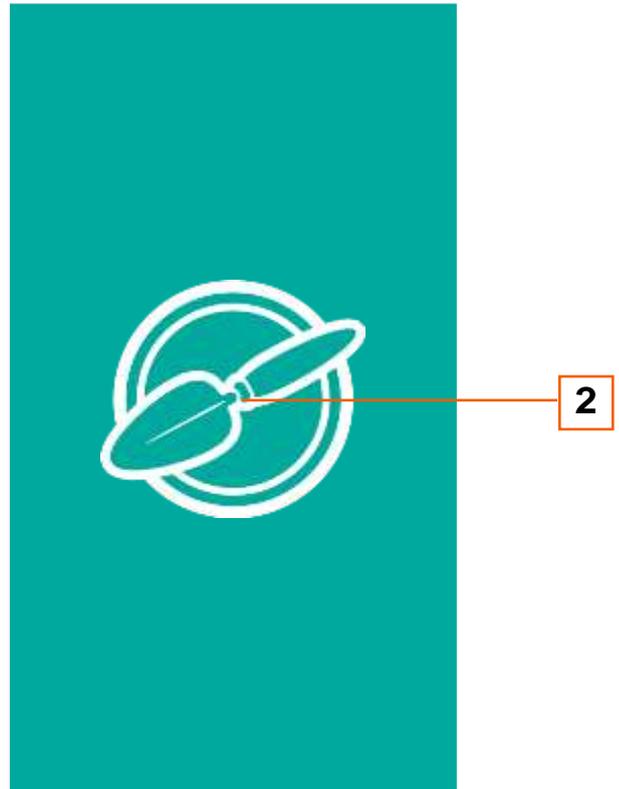
Instructions for use:

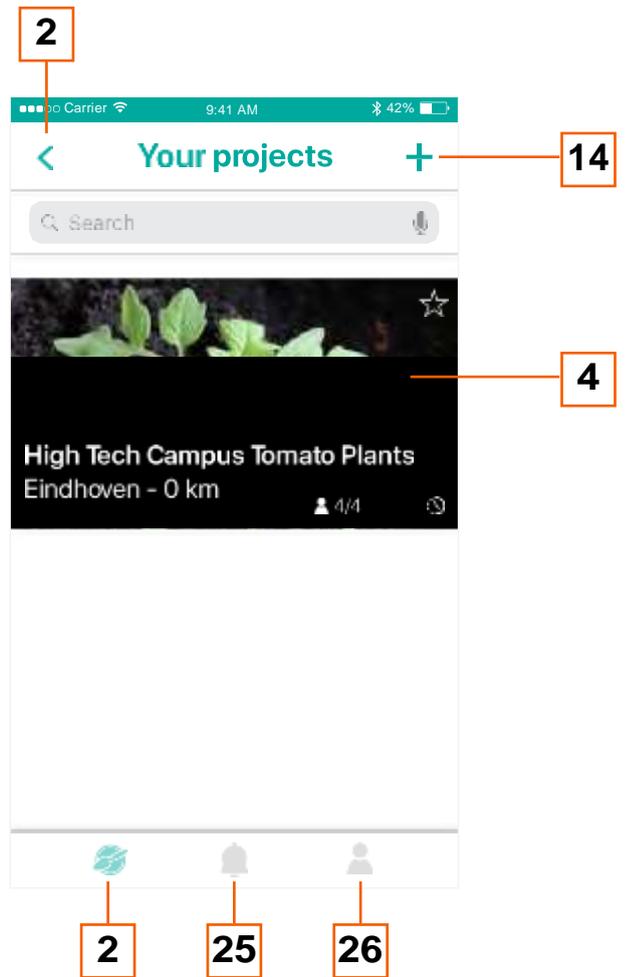
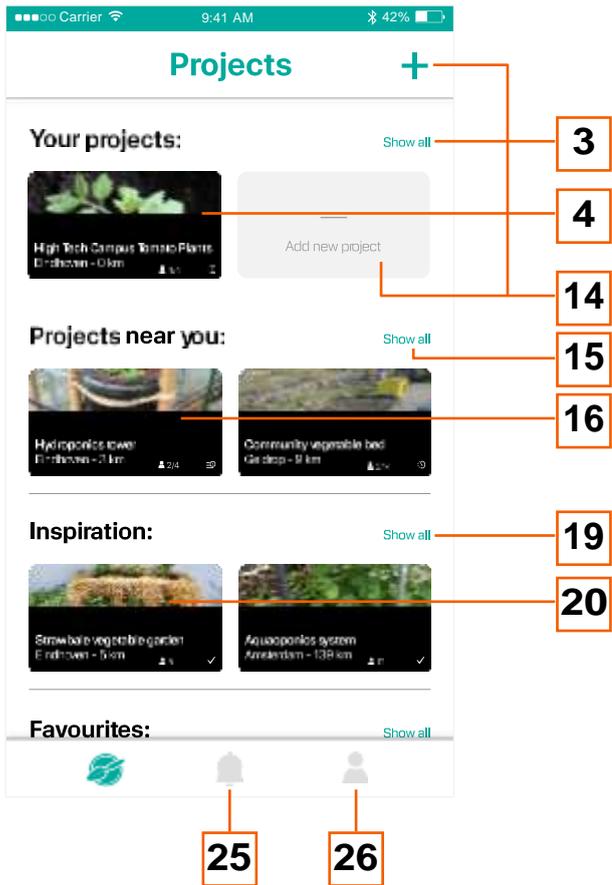
The number in the orange label is the number of the page to turn to simulate the interaction with the object the label indicates.

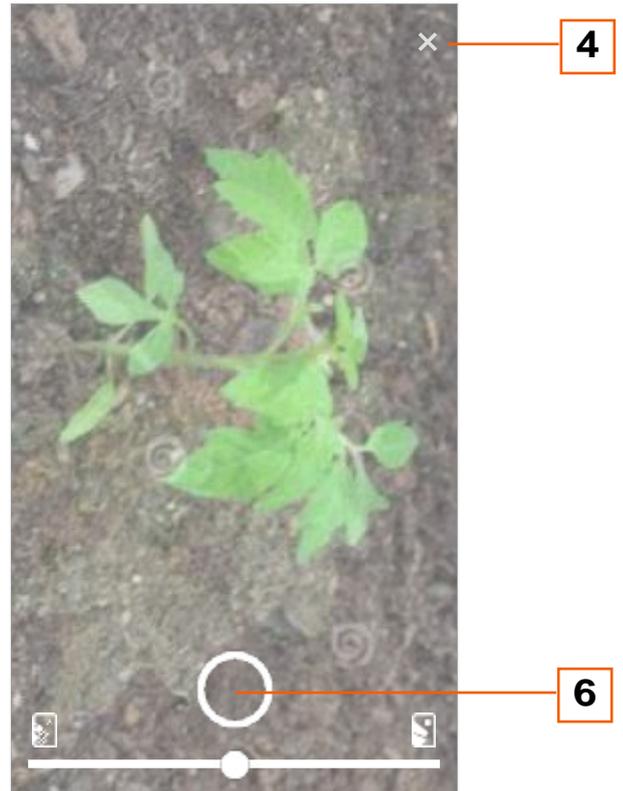
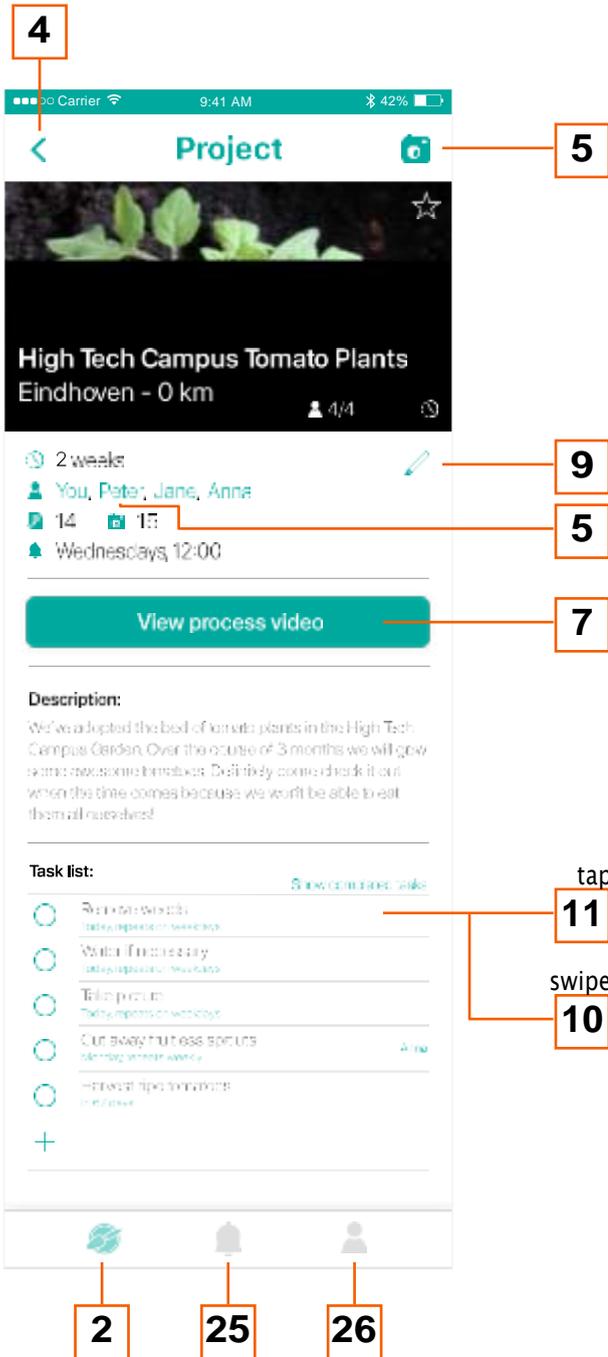
From a page you can only go to a page indicated by one of the labels. Just like in an actual app you can't access all pages from any page.

Not all interactions have been completely worked out in this prototype. If there is no label it just means I haven't been able to make a page for that interaction.

When a page is the end result of one of the assignments on the questionnaire, it will say so at the bottom of the page.



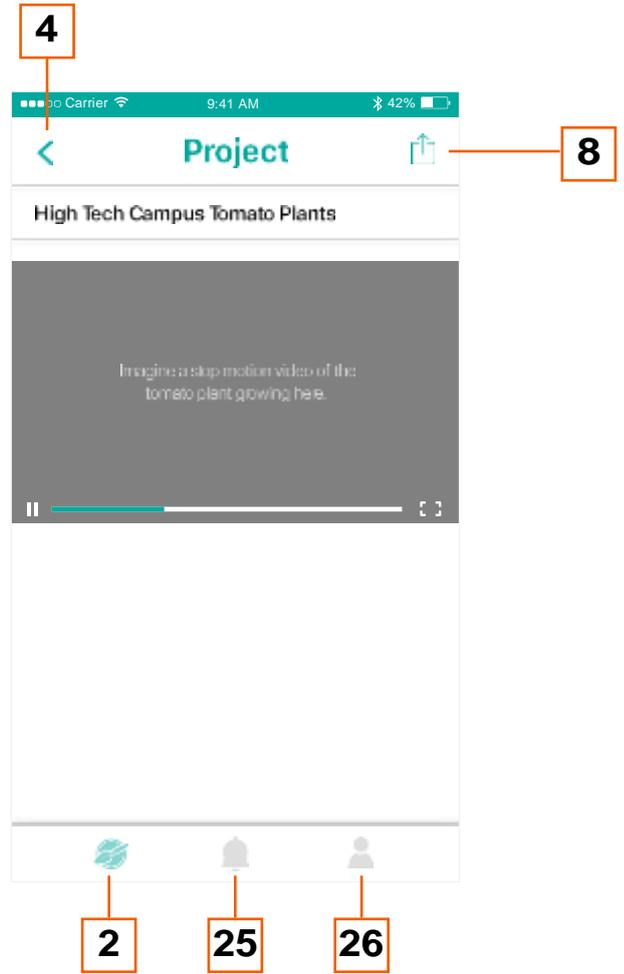




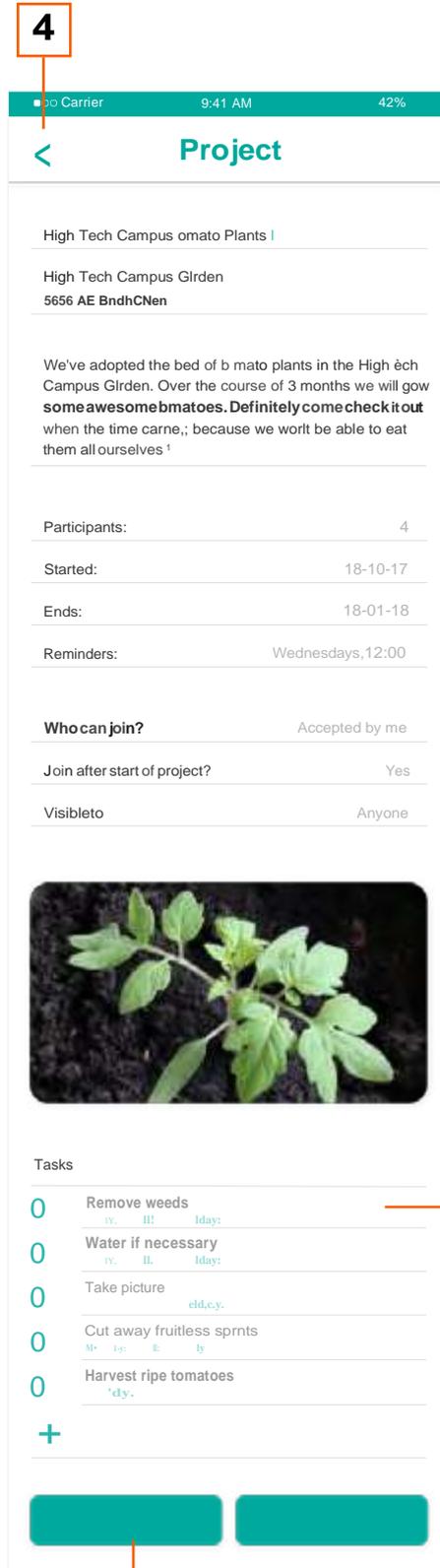
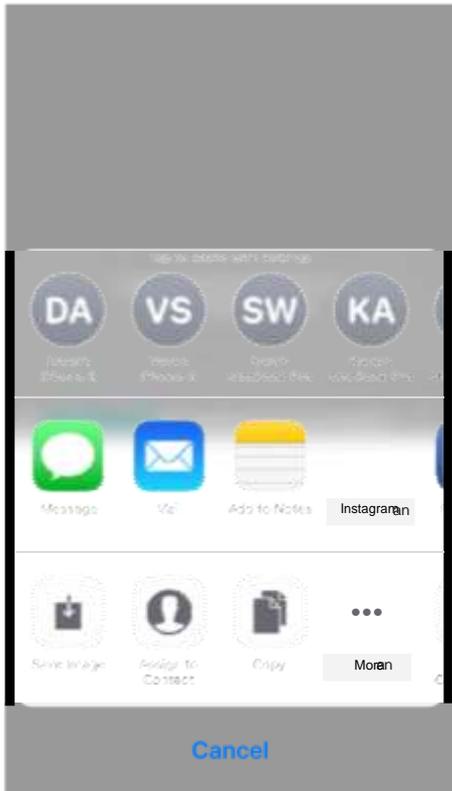


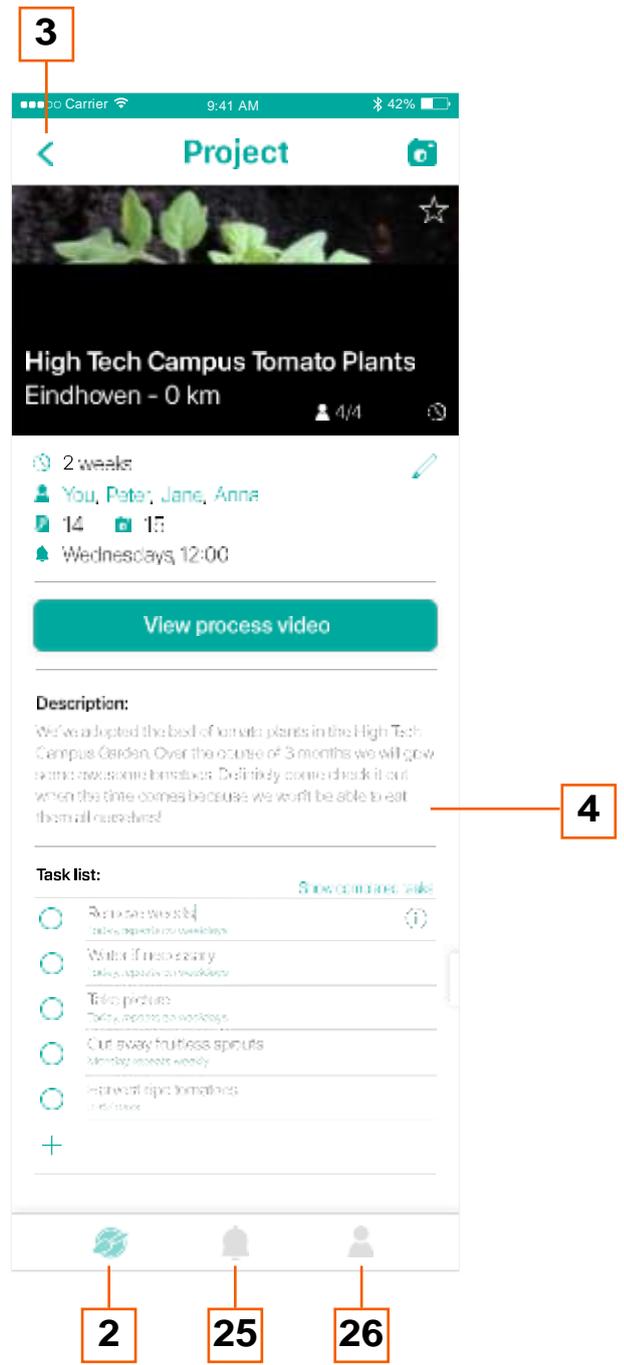
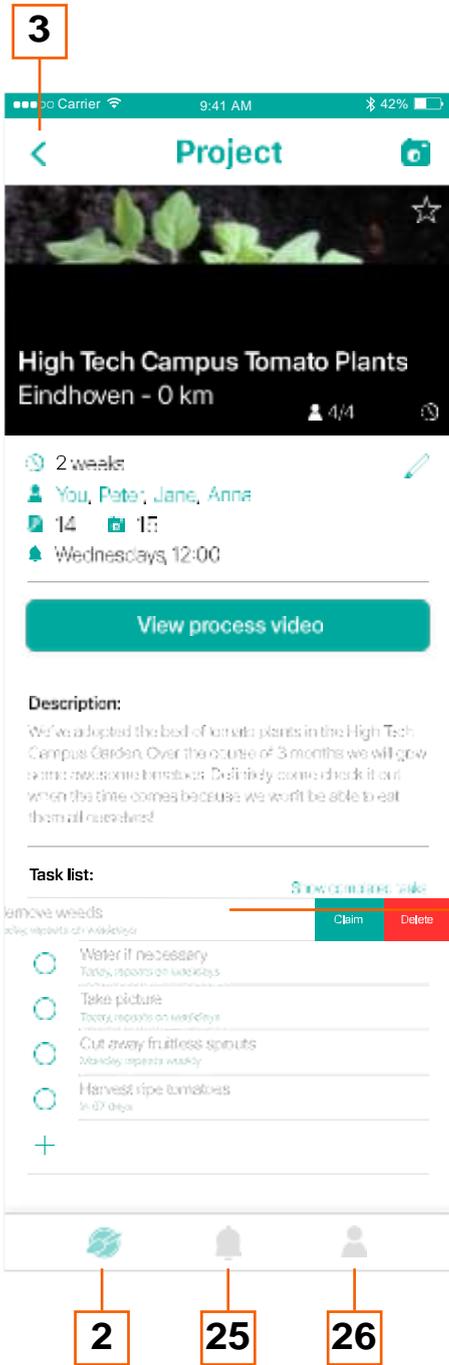
5

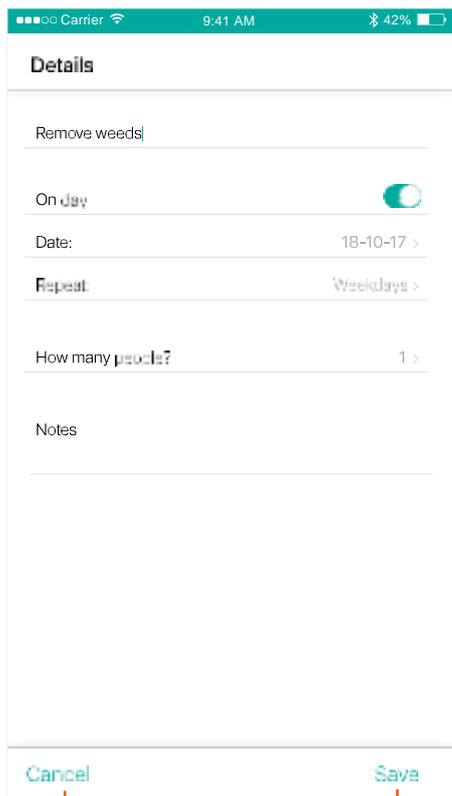
4



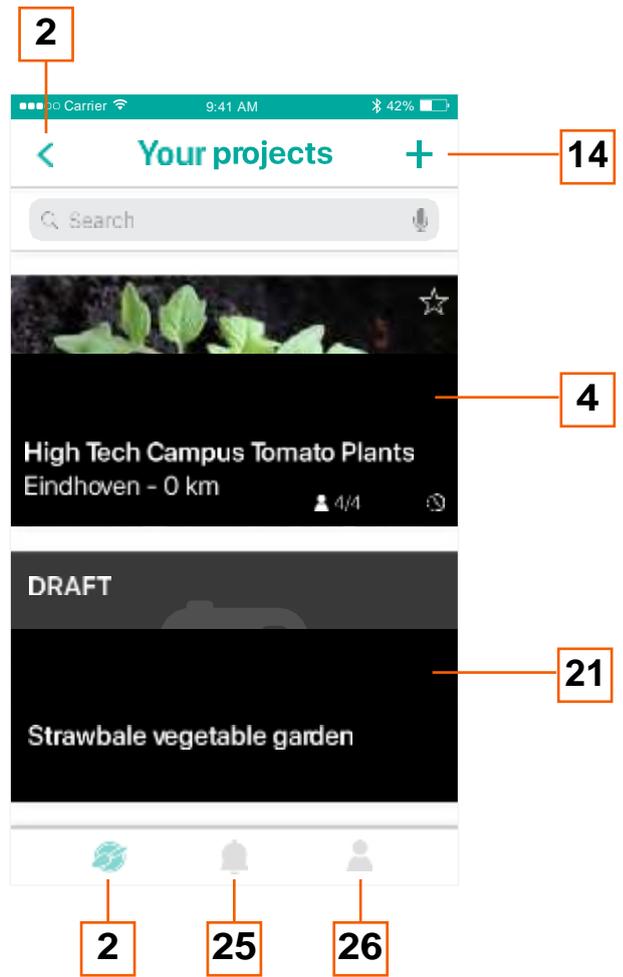
**You have completed the assignment
'Add a picture to the High Tech Campus
Tomato Plant stop motion video'.**







previous page
11 or 9



previous: 2 or 3 or 13

Carrier 9:41 AM 42%

New project

Project name

Location

Description

Participants: ∞ >

Starts: t.b.d >

Ends: t.b.d >

Who can join? Anyone >

Join after start of project? No >

Visible to Anyone >

add cover picture

Tasks

+

Save draft Publish

2

Carrier 9:41 AM 42%

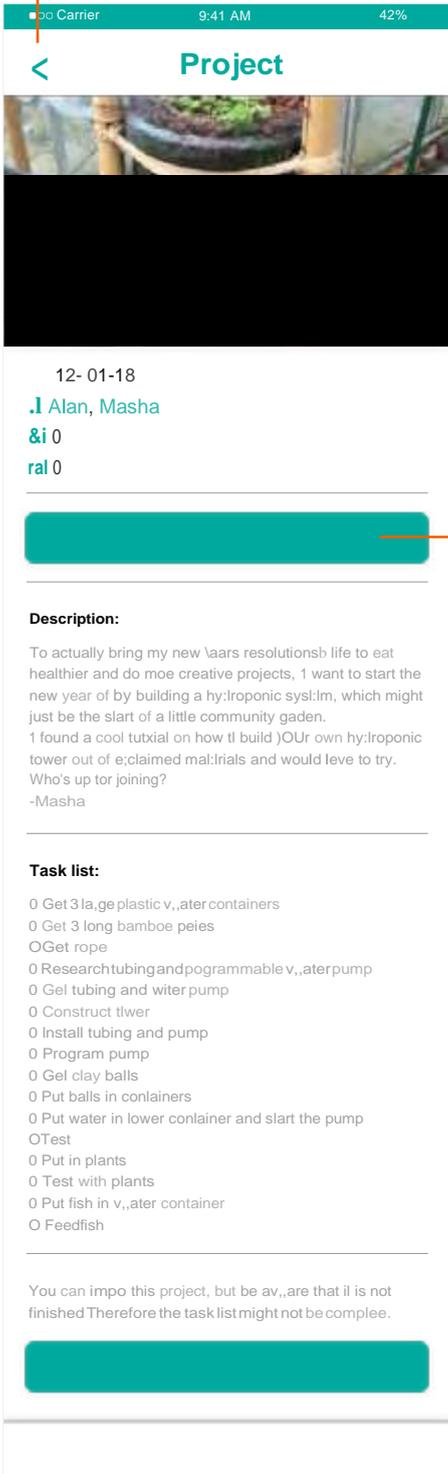
Projects near you

Hydroponics tower
Eindhoven - 3 km
2/4

2 25 26

16

15

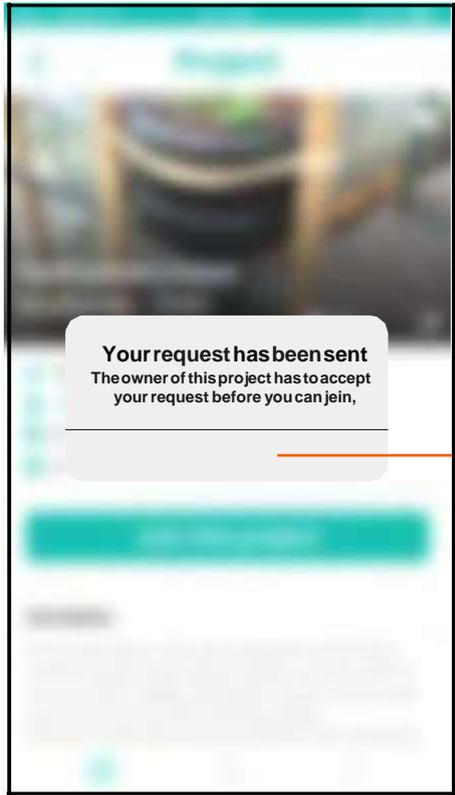


17

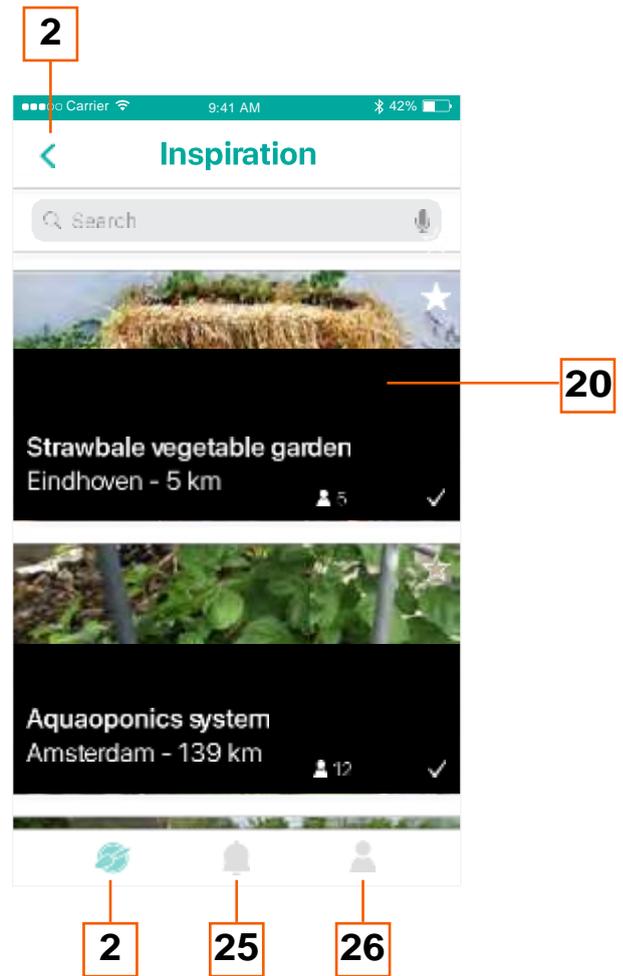
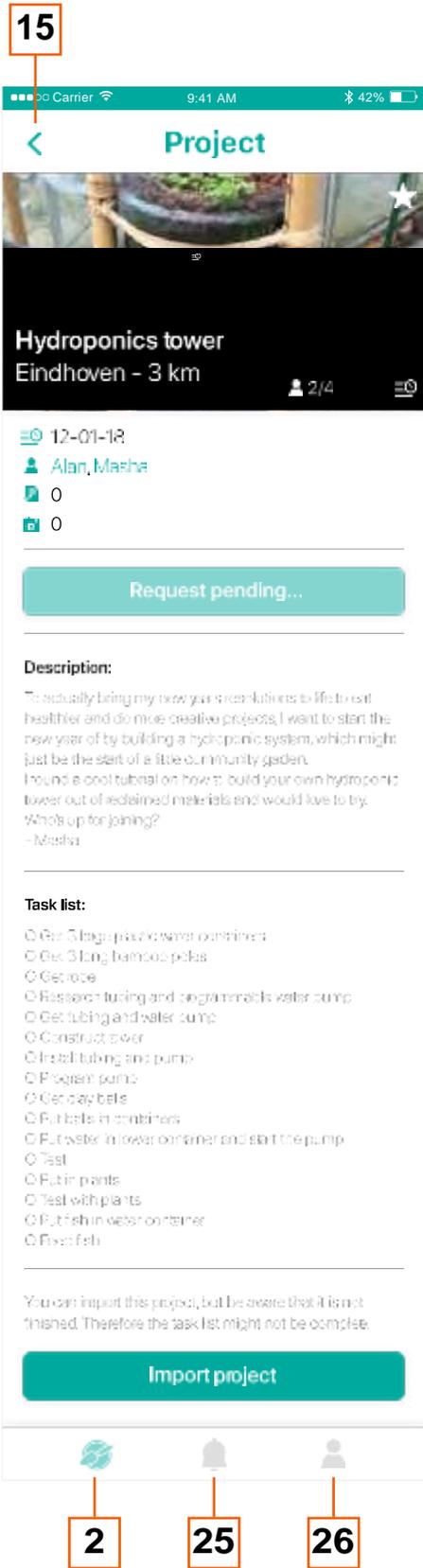
2

25

26



18



**You have completed the assignment
'Join the project Hydroponics Tower'.**

19

Carrier 9:41 AM 42%

< Project



13-09 -17

ElLEN, Lina, Joy, Stephnanè, Anna
&i 35
ral 115

Descripti on:

We saw this awesome idea at ÚJtch Design Waek and decided to try are own hand at it.It was so much fun b start this garden and it worl-s like a charm' Can definiely recommend trying!

Task list:

- 0 Buy small stiawbale (not hay!) (day 1)
- 0 Place at final location (day 1)
- 0 Completely soak stiawbale (day 21)
- 0 Keep strawbale wet though and th,ough (day 3-4)
- 0 Fertilize with oiganic fertilizer (day 5-7)
- 0 Spray with w,ter (day 5-11)
- 0 Ferilize with half the amount of éertilizer (day 8-11)
- 0 Add calciumb correct the pH 1.0lue (day 12)
- 0 Keep strawbale wet (day 72-21)
- 0 Check that tamperature is under 37°C (day 12-21)
- 0 Spread 3 cm of soil on the stswbale (day 21)
- 0 Put seeds in soil (day 21)
- 0 Make the soil wet (day 21)
- 0 Put potted plantes in the side of the bale with some soil (day21)
- 0 Check on plants and water il necessary (day 21-end)

21

2

25

26

22

Carrier 9:41 AM 42%

< New project

Strawbale "3getable garden!

We saw this awesome idea at ÚJtch De sign Waek and decidedb try are ow n hand at it.It was so much fun b start this garden and it worl-s like a charm' Can definiely recommend trying'

Participants: 5

Starts: 10-10-17

Ends: 10-04-18

Who can join? Accepted by me

Join after start of project? No

Visible to Anyone



Tasks

- 0 Buy small stiawbale (not hay!)
- 0 Place at final location
- 0 Completely soak stiawbale
- 0 Keep strawbale wet though and th,ough
- 0 Fertilize with oiganic fertilizer
- 0 Ferilize with half the amount of éertilizer
- 0 Add calcium b correct the pH 1.0lue
- 0 Keep strawbale wet
- 0 Check that tamperature is under 37°C
- 0 Spread 3 cm of soil on the stswbale
- 0 Put seeds in soil
- 0 Make the soil wet
- 0 Put potted plantes in the side of the bale with some soil
- 0 Check on plants and water il necessary

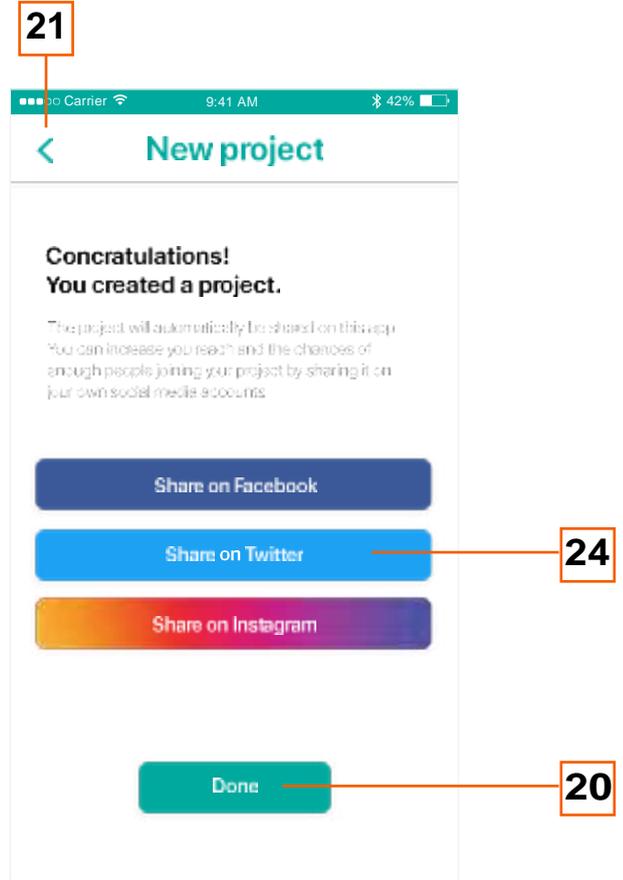
+

20

23



20



21

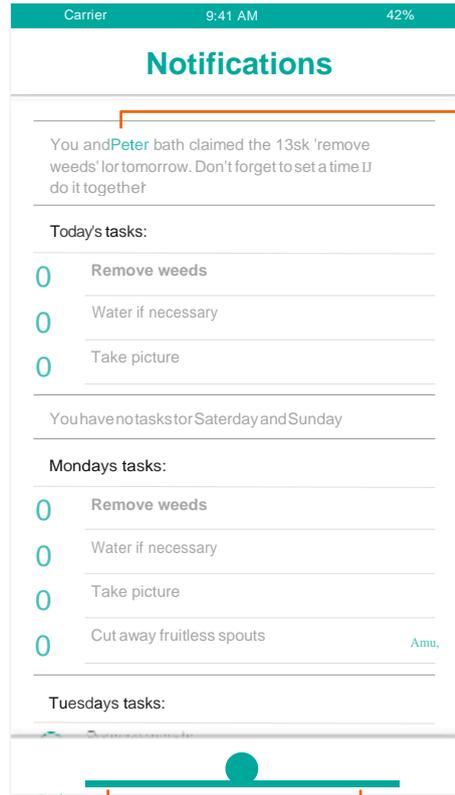
24

20

**You have completed the assignment
'Copy and publish the project Strawbale
Vegetable Garden'.**



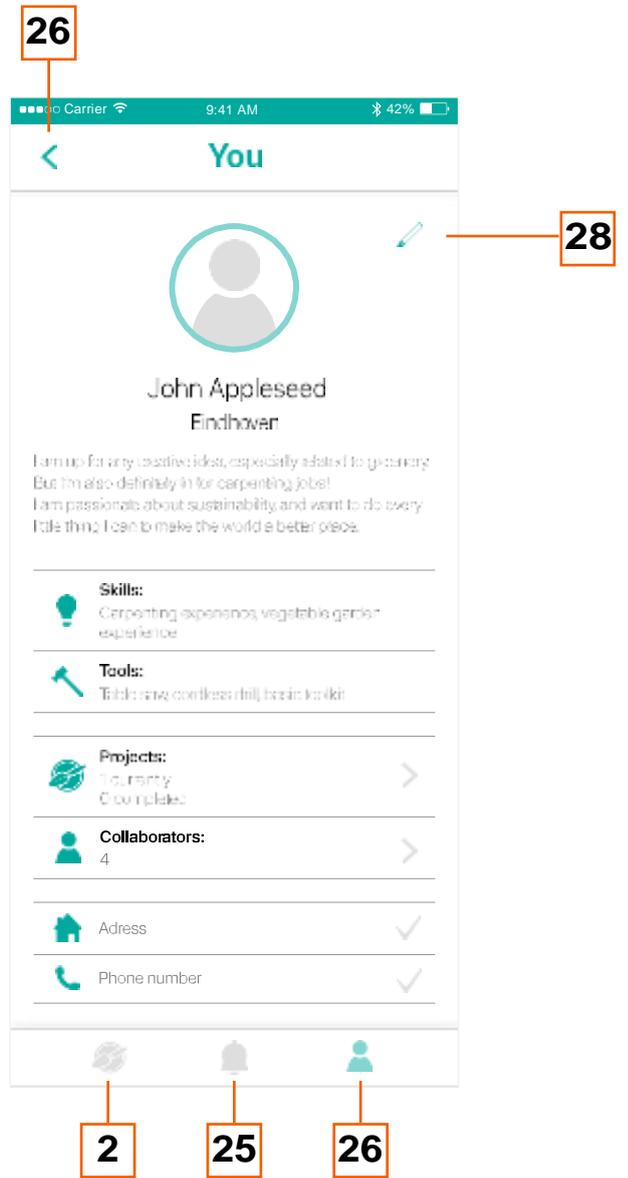
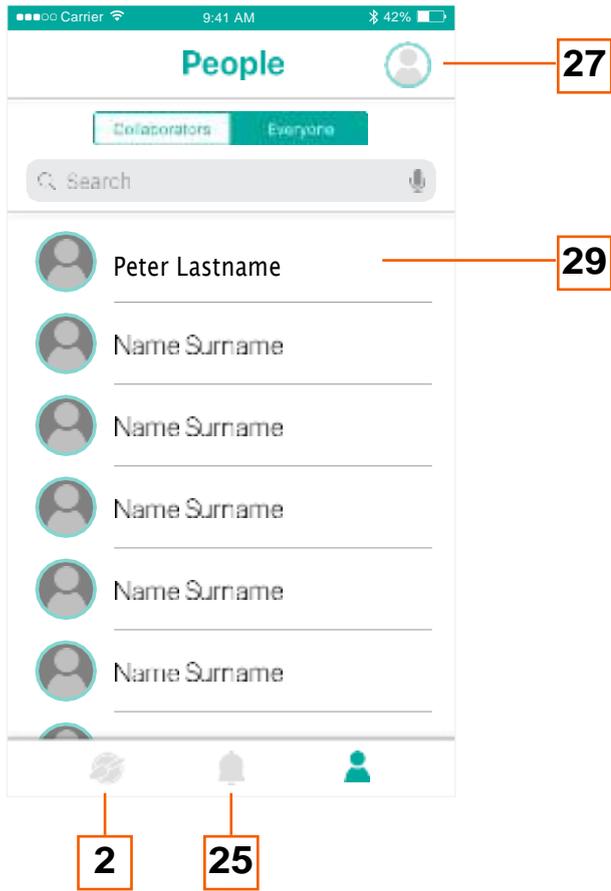
23



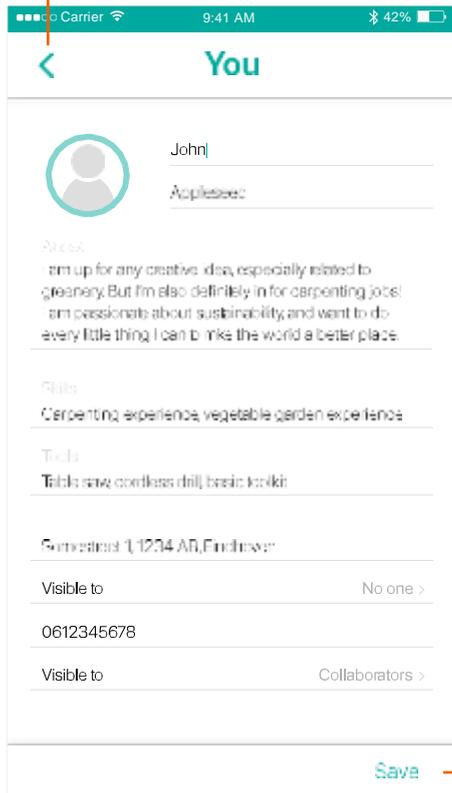
29

2

26

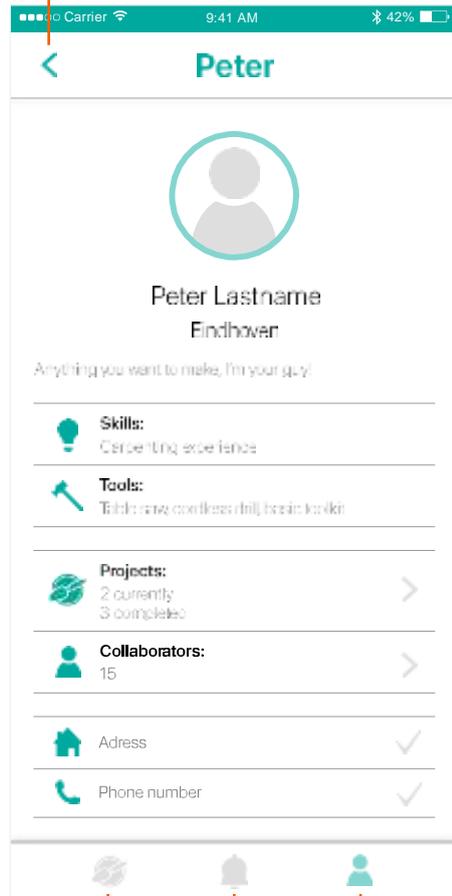


27



27

Previous: 4 or 25 or 26



2

25

26

You have completed the assignment 'Find Peter's profile'.

APPENDIX C – USER TEST QUESTIONNAIRE

The questionnaire starts on the next page

User test #1 10-10-17

Please answer the following questions according to prototype #1.
Make sure to read the instructions for use on the prototype before starting.

Section A: Assignments

Try to complete the following assignments. For each one, write down each page you access while trying to complete it. This includes pages that did not help you progress towards the goal. Complete the assignments in order: Last page A.1 = first page A.2.
Then give an indication of whether the task was easy or difficult, slow or quick, and fun or tedious by putting an X on the line between the respective words.

A.1: Add a picture to the High Tech Campus Tomato Plant stop motion video.

Easy	_____	Difficult
Slow	_____	Quick
Fun	_____	Tedious

A.2: Join the project hydroponics tower

Easy	_____	Difficult
Slow	_____	Quick
Fun	_____	Tedious

A.3: Find Peter's profile

Easy	_____	Difficult
Slow	_____	Quick
Fun	_____	Tedious

A.4: Copy and publish the project Strawbale Vegetable Garden.

Easy	_____	Difficult
Slow	_____	Quick
Fun	_____	Tedious

Section C: overall impressions

For these questions, please give a grade between 0 and 10 and suggestions or remarks if you have any.

C.1: What do you think about the overall design of the app?

C.2: What do you think about the overall concept of the service represented by the app?

C.3: Is this app/service something you would want to use yourself?

Section D: survey (optional, but helpful)

Rate this survey on the following aspects. (This helps me improve my surveys in the future.)

- Length: Too short
 Right length
 Too long
- Clarity Not clear
 Understandable
 Very clear
- Prototype Not representative of reality
 Adequately representative of reality
 Very representative of reality

APPENDIX D – CHANGES PROTOTYPE 1 TO 2

The document starts on the next page

Note: Not all photos used in the prototype are my own.

The picture of a young tomato plant was retrieved from <https://kiza.eu/art/image/869>.

The picture used for 'Community Vegetable Bed' is property of Buurttuin Breda.

The strawbale vegetable garden was retrieved from: <http://oldstreettown.com/wordpress/vijf-voordelen-en-een-nadeel-van-tuinieren-op-strobalen/>

The second picture of a young tomato plant is also not mine. Unfortunately I was unable to find the owner to credit them properly.

The PET hydroponic wall is a still from this video: <https://www.youtube.com/watch?v=9B2Yyvm5A5I>

The picture used for 'Edible Public Park' was retrieved from: <https://www.eet-baarnijmegen.nl/moerbeiplantsoen/>

The picture used for 'Community Garden in the Fields' is property of High Tech Campus.



mmunit

MAKERS

VERSION DOCUMENTATION

This is the documentation of the differences between version 1 and version 2 of the community makers app.

OVERALL DESIGN

While previously the app used lots of elements of the apple iOS look and feel, the second version has moved more towards its own aesthetics. Also, the first version was quite inconsistent in design choices, while in the second version the design is consistent throughout all pages. This makes the experience of using the service more smooth and easy.

Fonts version 1:

SF Pro Text Bold

SF Pro Display Semibold

SF Pro Display Regular

SF Pro Display Light

Version 1 used many different font sizes without any real rules. It also used very small font sizes like 12 pt and even 10 pt which were very hard to read.

Fonts version 2:

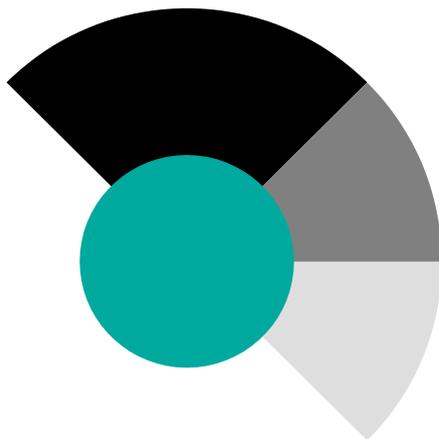
Lobster Two Regular

BUNGEE

SF Pro Display Light

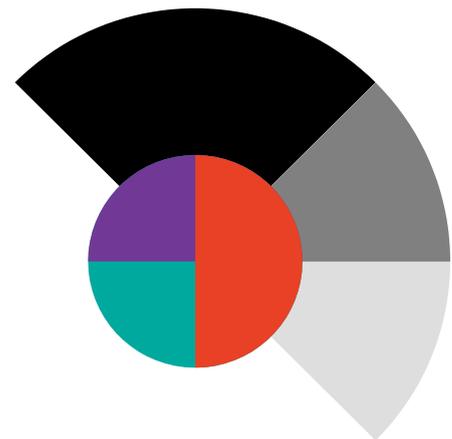
Version 2 uses exclusively font size 14 pt and 17 pt in text and titles, and 13 pt and 17 pt in buttons. The font Lobster 2 is only used at the top of the pages in 27 pt.

Colours version 1:



Primary colour: White
Secondary colours: Black, Greys
Accent colour: Turquoise

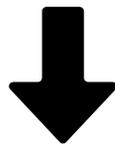
Colours version 2:



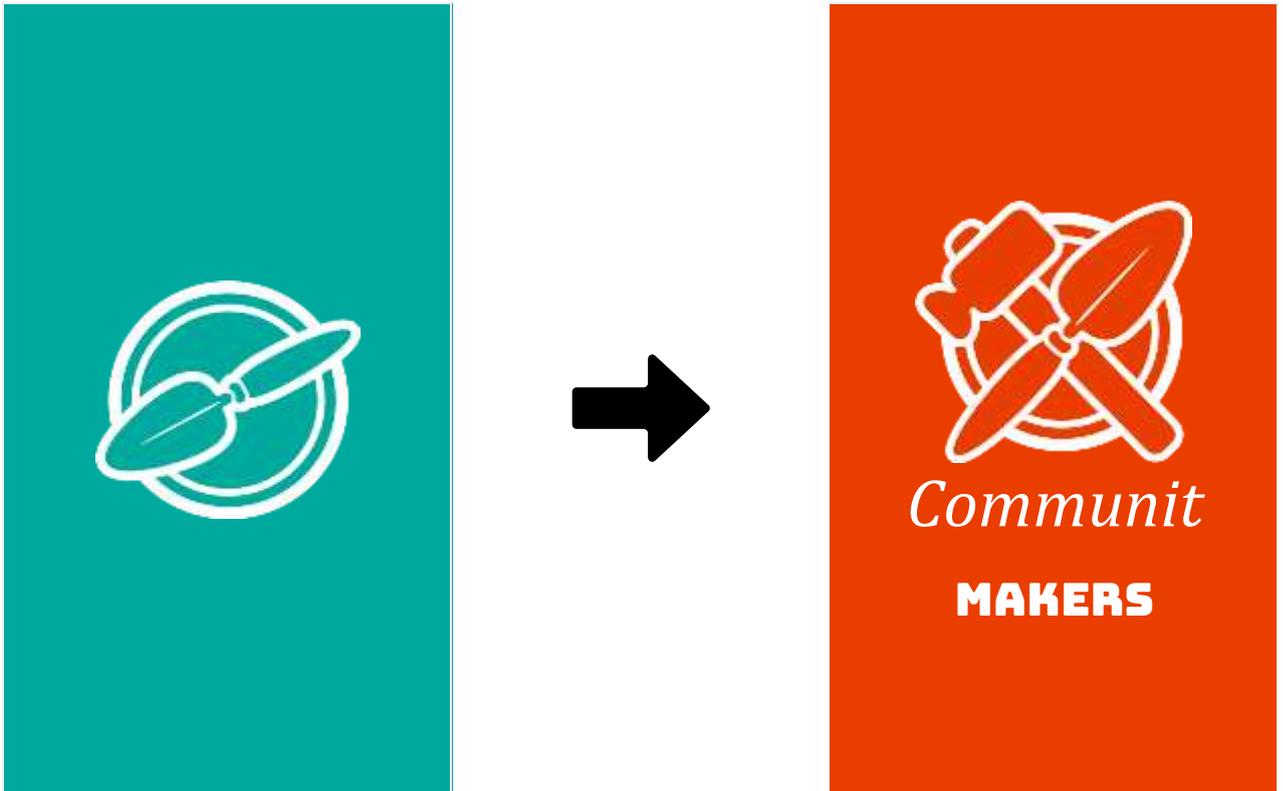
Primary colour: White
Secondary colours: Black, Greys
Accent colours: Orange, Turquoise, Purple

INTERACTIONS

As is visible from the overview pictures below, the second version of the prototype is much more elaborate than the first, giving a better experience of what it would be like to use the actual app. More interactions have been modeled and more examples were added in.



LOADING SCREEN

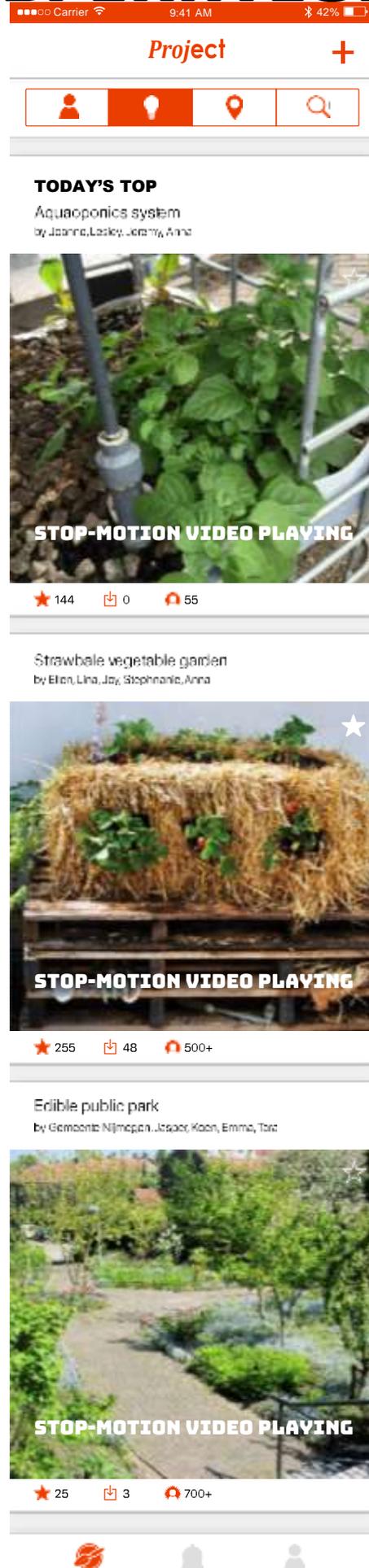
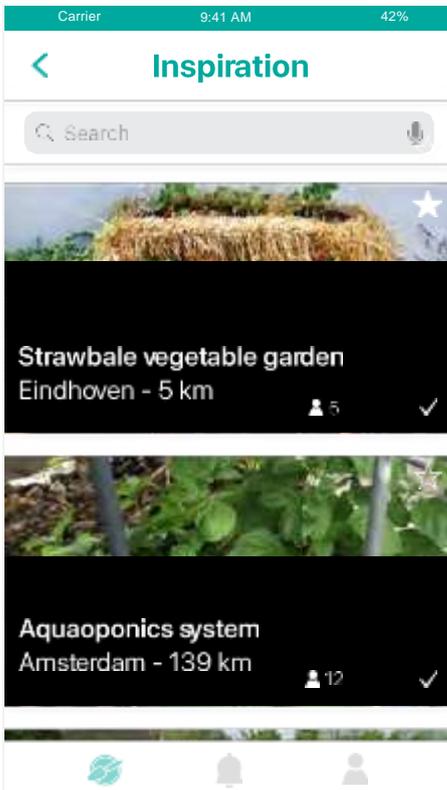
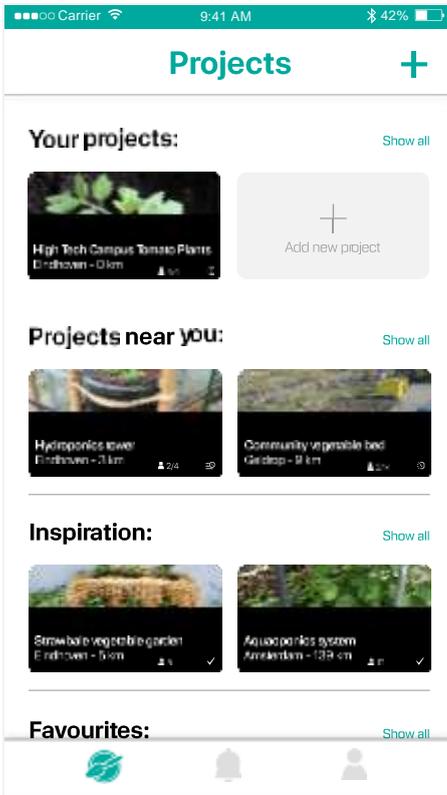


The app was given a name, Community Makers. I started with a few names, of which I first chose Community Service, but I felt the word play was too strong, and did not want my platform to be associated with punishment. The name Community Makers was more suitable in my opinion. It can be read two ways: On the one hand, the platform facilitates communities of makers, on the other hand the people on the platform make new communities.

The logo changed to represent more diversity: I do not want the app to only be for community gardens, but also for people who, for instance, want to improve their community centers or build playgrounds or really anything that might improve the neighbourhood. I also thought the previous logo was a bit individual, as it showed only one tool. The crossed tools reference crossed swords, which is a sign of empowerment and readiness to fight, or in this case, readiness to make something happen.

The primary accent colour changed to orange. This is a requiem from when the name was community service and the orange was to represent the orange jumpsuits that are worn during community service. I chose to keep the colour because I think it is a stronger, fresher colour than the blue.

HOME SCREEN INSPIRATION

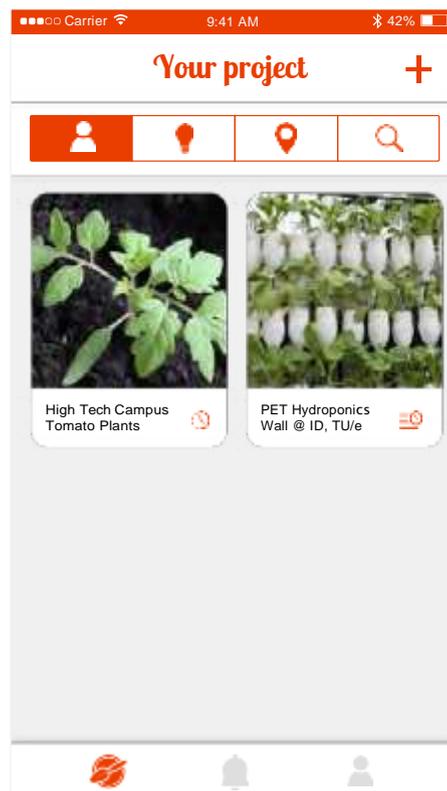
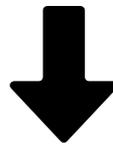
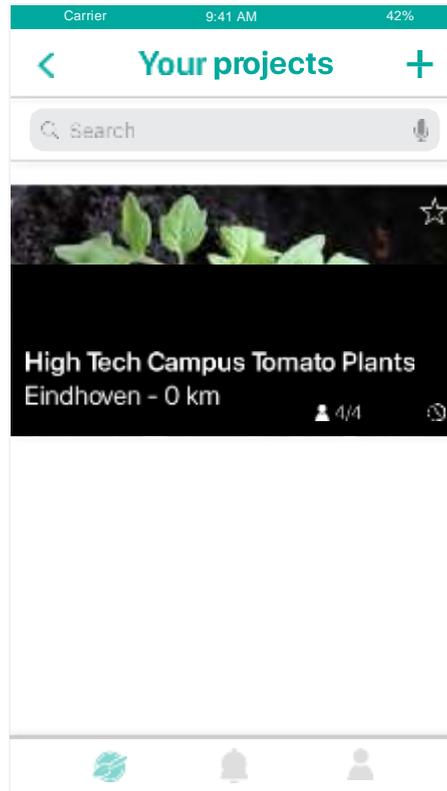


YOUR PROJECTS

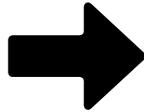
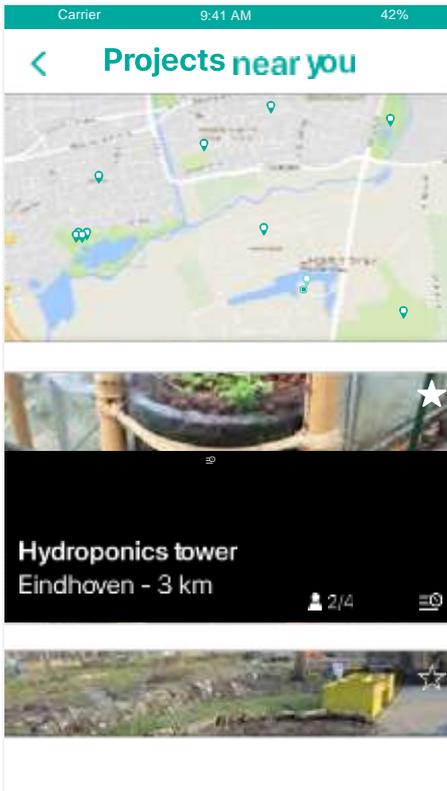
The home screen changed into the inspiration screen. This choice was based on the observation that the time-lapse videos did not play a big enough role. They are supposed to perform a core function (inspiring and motivating), but instead were lost deep in the app, with many interactions needed to access them. Therefore they are now featured on the inspiration screen/ front page, so that people are immediately confronted with inspiring projects to strengthen their motivation.

The 'Your projects' and 'Projects near you' pages can now be accessed from the tab bar on the top of the page. Also, the search function was moved to a tab.

The 'Your Projects' page was moved to its own tab on the home screen. The presentation of the projects was simplified more to contain only the latest picture, the title and the status of the project. Also it was revised to better fit the new aesthetics: i.e. fresher and more sleek. Again, the search function now has its own tab.



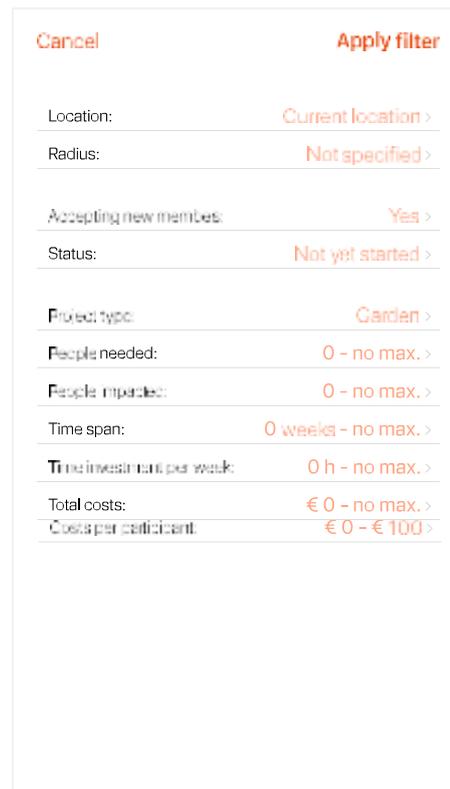
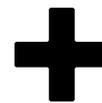
PROJECTS NEAR YOU



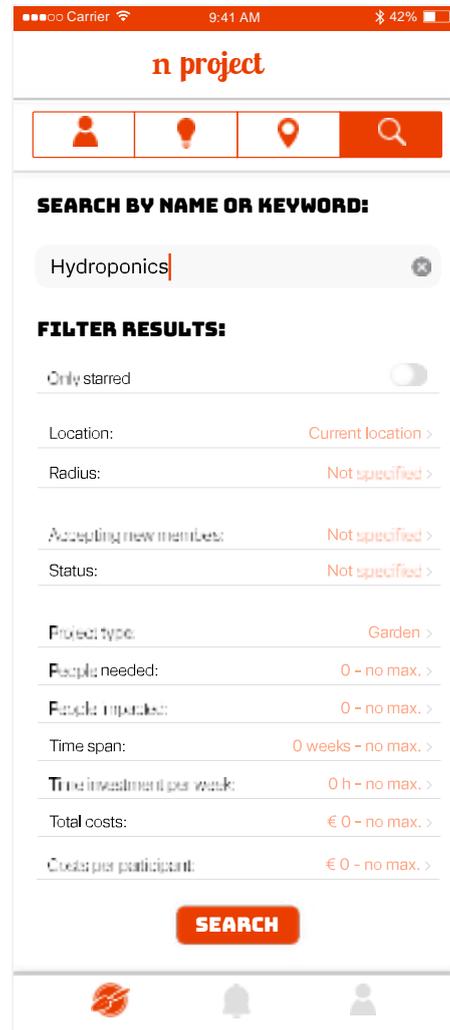
The view projects near you was evaluated at an 8,2 by the participants of the user test, and as such was one of the more important functionalities of the app.

It changed to be more focused on location, by showing a full view of the map, allowing you to view projects by tapping the location.

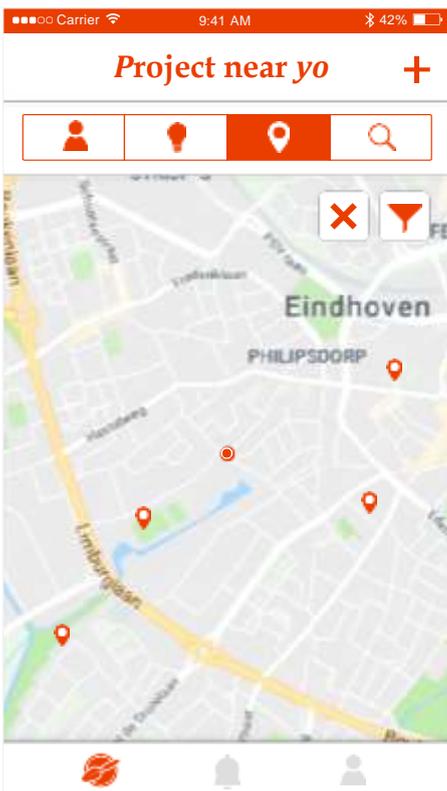
Also it now includes a filter function so that people can specify more what type of project they want to join.



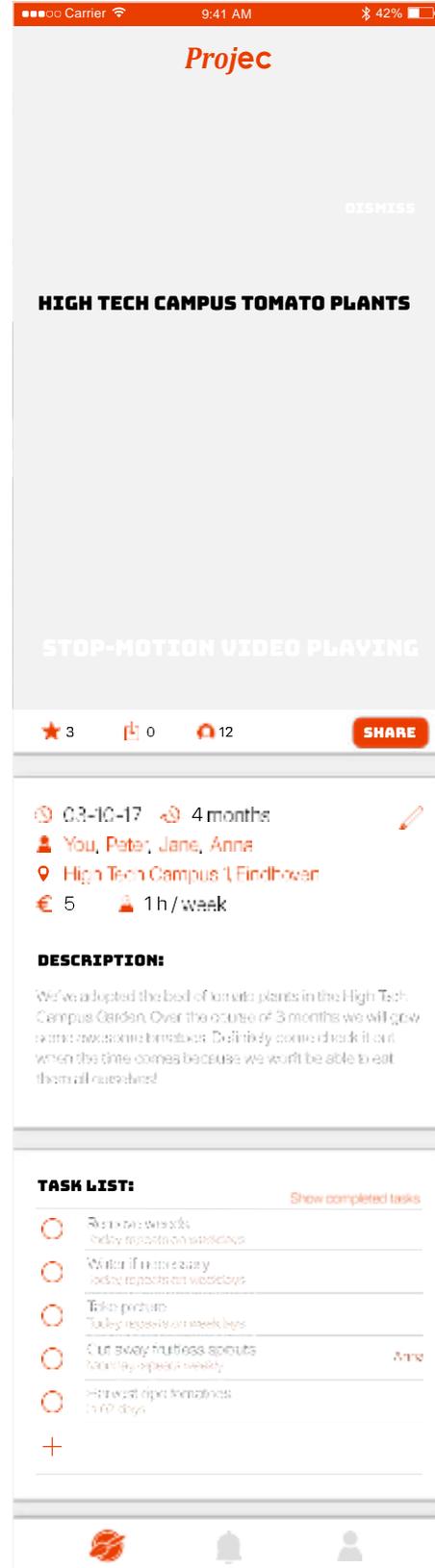
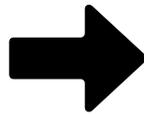
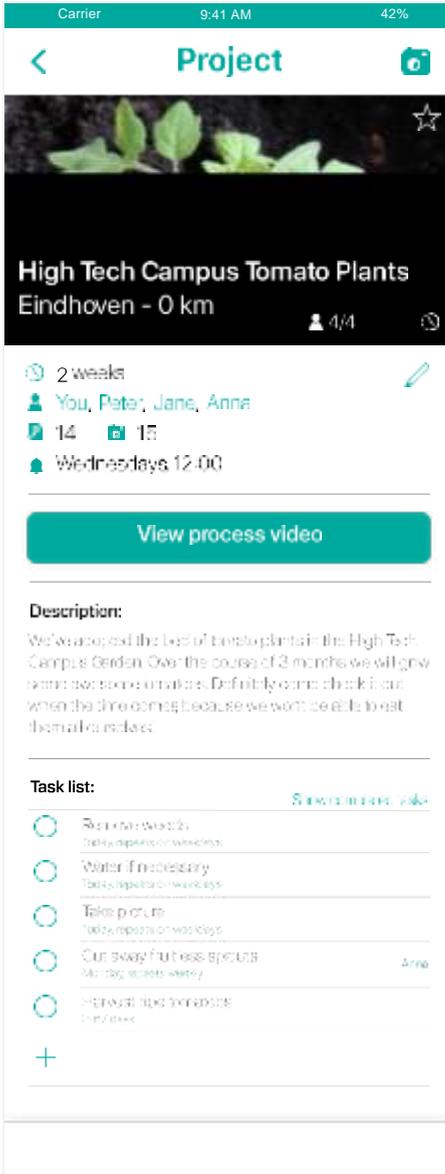
find projects



The 'find project' function is new. It was added in because participants of the user test indicated they would like to search for projects based on different parameters such as the amount of resources needed (time, money, people) and the impact of the project (the amount of people it affects).



PROJECT PAGE YOUR PROJECT



The stop motion video was brought to a prominent place in the project page, once again to give this core function more weight in the app.

Participants of the user test pointed out that a project could only be shared upon creation and only by the owner of the project. This was a big problem, because the concept is based on the idea that people can share their projects with their own network. Now any member of the project can share it at any time.

Notifications about a project are now also shown on the project page instead of just in the notification centre.

The descriptive information available on the project was changed to no longer include the amount of tasks completed and the amount of photos taken as this was not valued as important by the participants of the user test. It now includes the duration, cost and time investment per person, which was information the participants missed.

The location can now also be tapped to show the project on the map.

The view of the stopmotion video is identical to the view used in the inspiration page. This was done to keep the design consistent and therefore easier to navigate. It shows information that relates to how high the app scores on being inspirational. That is: how often it was starred, how often it was imported and how many people it impacted.



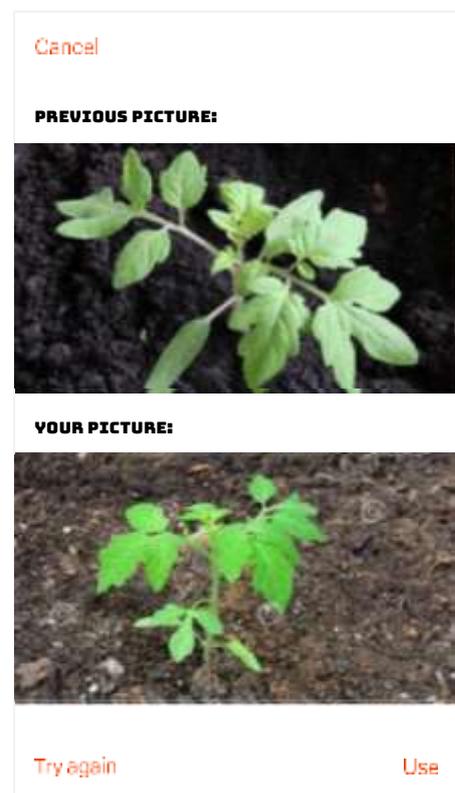
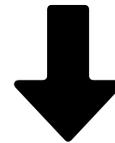
TAKE PICTURE



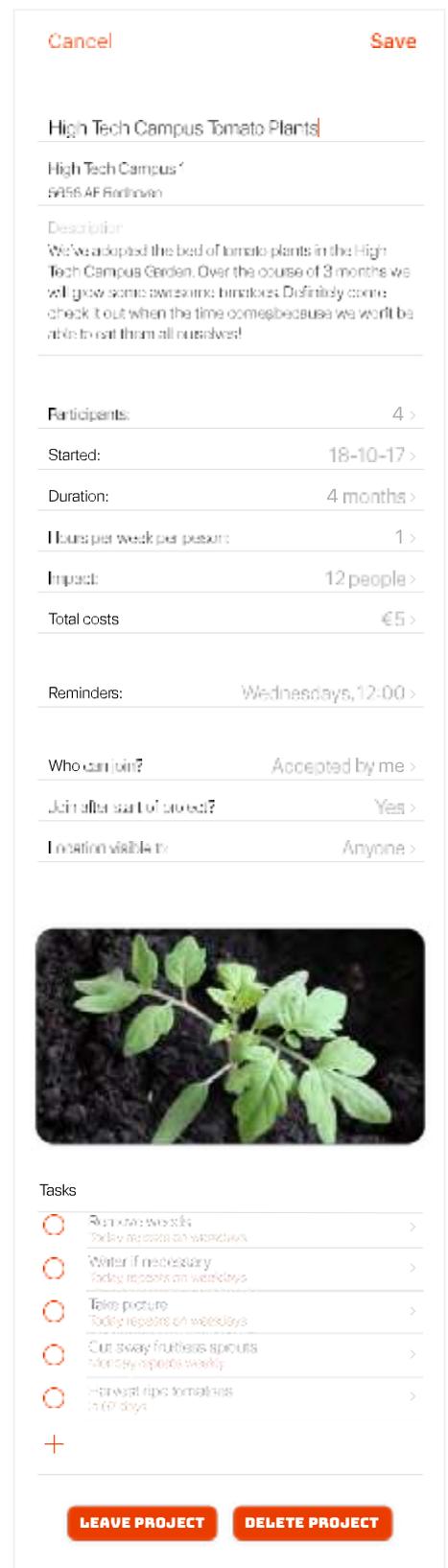
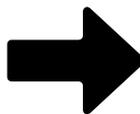
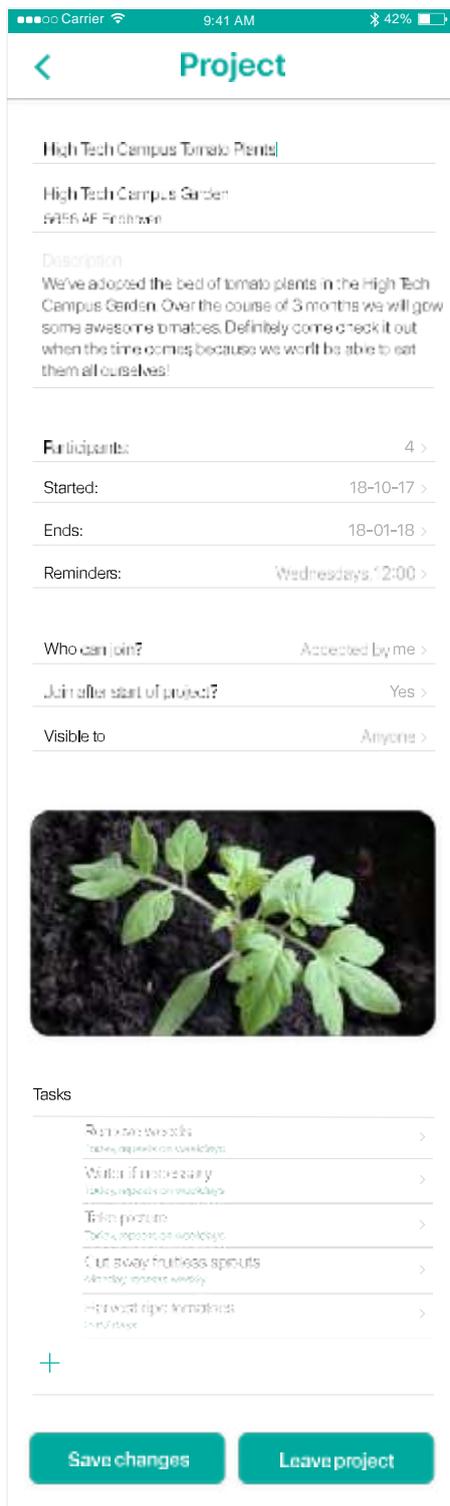
This function remained the same for the most part. The prototype now shows some more screens that give the experience. However, this was still a bit meagre so outside of the prototype there is a processing file that actually shows the picture taking functionality: It lets you take pictures, adjust the opacity of the previous picture and it constructs a GIF from the pictures taken and displays this in the project page.

The function to adjust opacity was not rated very high by participant of the user test. It does however remain in the prototype at least for now because it wasn't tested with a functional camera yet, which might change the perception of users.

The changes that were made were purely aesthetic.



EDIT PROJECT

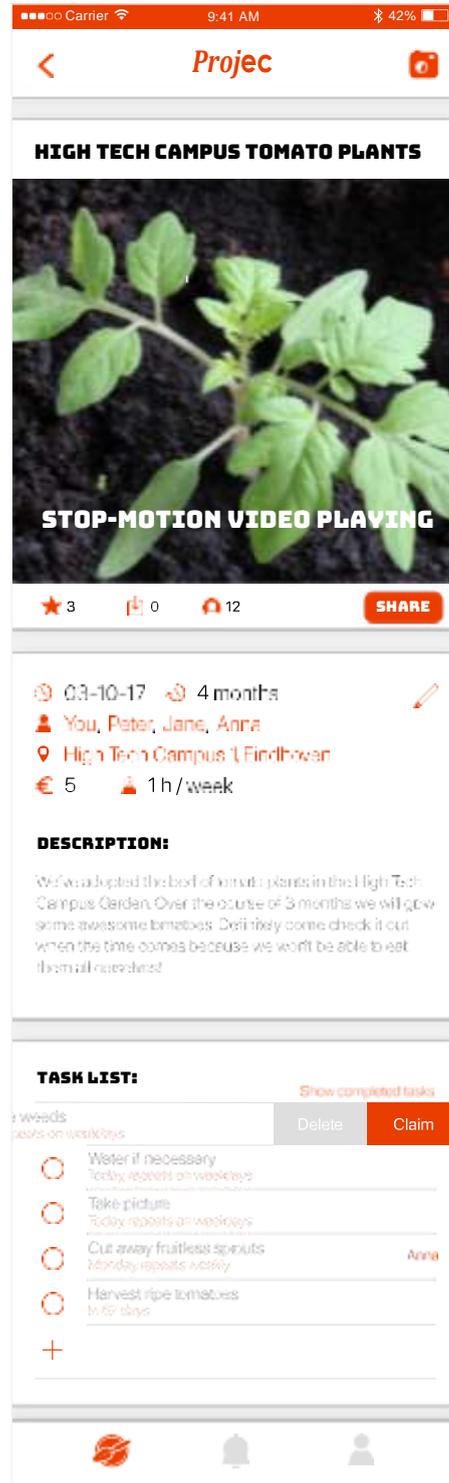
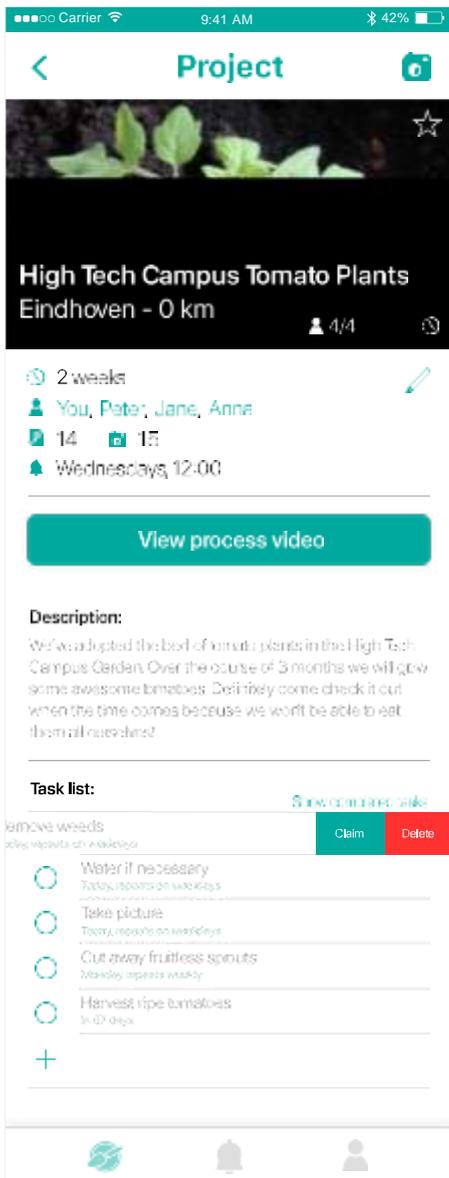


The new information added on the project page was also added to the edit page.

The project is now always visible to everyone. People can however decide to hide the location.

There is now also an option to delete the project.

TASK MANAGEMENT



Being able to claim a task was rated an 8,3. This function therefore remains.

Editing task details was not rated very high during the user test, with an average of 6,3. However, the functionality remains because it can be useful when actually doing a project. Especially adding notes and specifying whether a task should be executed on a specific date or not and whether it should repeat may be important when managing tasks with multiple people.

Carrier 9:41 AM 42%

Details

Remove weeds

On day

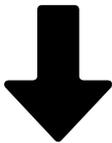
Date: 18-10-17 >

Repeat: Weekdays >

How many people? 1 >

Notes

Cancel Save



Cancel Save

Remove weeds

On day

Date: 18-10-17 >

Repeat: Weekdays >

How many people? 1 >

Notes

NEW PROJECT

Carrier 9:41 AM 42%

New project

Project name

Location

Description

Participants: ∞ >

Starts: t.b.d >

Ends: t.b.d >

Who can join? Anyone >

Join after start of project? No >

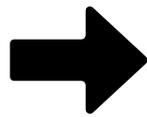
Visible to Anyone >

cover

Tasks

+

PUBLISH



Cancel Save draft

Project name

Location

Description

Participants: ∞ >

Starts: t.b.d >

Duration: t.b.d >

Hours per week per person: t.b.d >

Impact: t.b.d >

Total costs: t.b.d >

Reminders: None >

Who can join? Anyone >

Join after start of project? Yes >

Invitation visible to: Anyone >

Temporary cover picture will be updated with last picture taken

add cover picture

Tasks

+

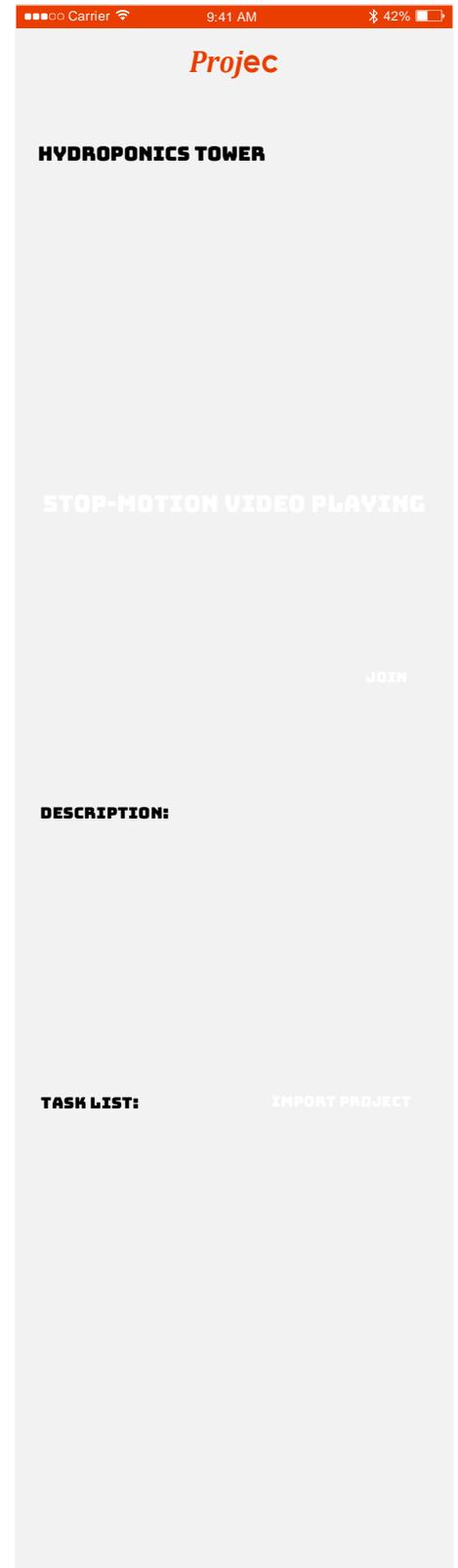
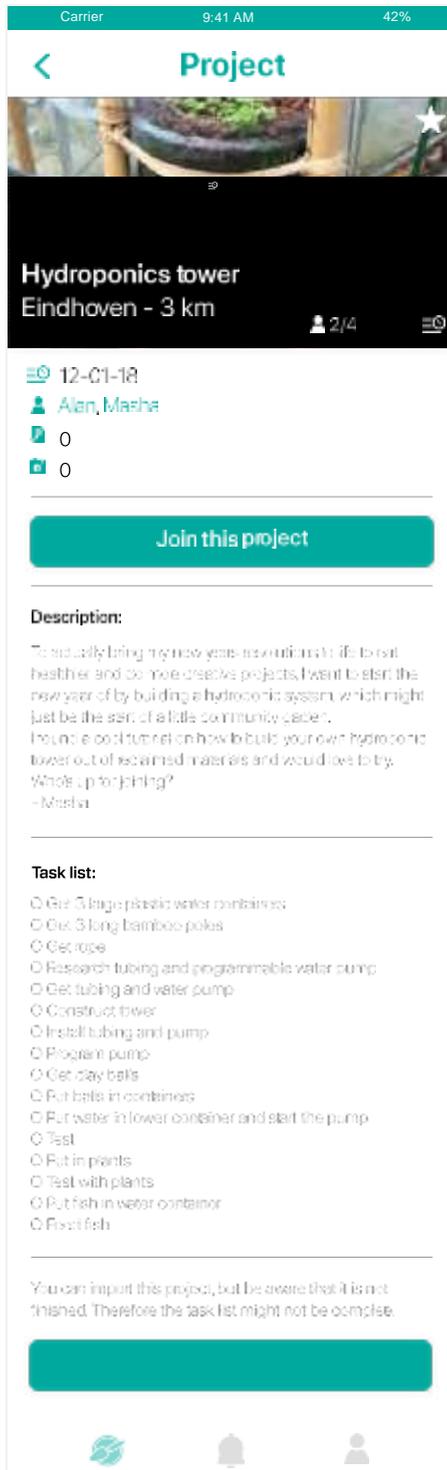
PUBLISH

New project information was added to the creation page.

Users can now set project reminders upon creation.

It is specified more clearly that the cover picture will be updated with the latest picture taken.

PROJECT PAGE GENERAL



Similar changes to 'Project page (your project)'.

IMPORT PROJECT

Carrier 9:41 AM 42%

[←](#) **New project**

Strawbale vegetable garden

Location

Description
We saw this awesome idea at Dutch Design Week and decided to try our own hand at it. It was so much fun to start this garden and it works like a charm! Can definitely recommend trying!

Participants: 5 >

Starts: 10-10-17 >

Ends: 10-04-18 >

Who can join? Accepted by me >

Join after start of project? No >

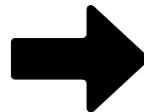
Visible to Anyone >



Tasks

- Buy small strawbale (not hay!) Day 1
- Place at final location Day 1
- Completely soak strawbale Day 2
- Keep strawbale wet through and through Day 2, repeats every day, stops after 3 times
- Fertilize with organic fertilizer Day 4, repeats every day, stops after 3 times
- Fertilize with half the amount of fertilizer Day 4, repeats every day, stops after 3 times
- Add calcium to correct the pH value Day 11
- Keep strawbale wet Day 11, repeats every day, stops after 11 times
- Check that temperature is under 20°C Day 11, repeats every day, stops after 11 times
- Spread 3 cm of soil on the strawbale Day 21
- Put seeds in soil Day 21
- Make the soil wet Day 21
- Put potted plants in the side of the bales with some soil Day 21
- Check on plants and water if necessary Day 21, repeats every day

[+](#)



Cancel **Save draft**

Strawbale vegetable garden

Location

Description
We saw this awesome idea at Dutch Design Week and decided to try our own hand at it. It was so much fun to start this garden and it works like a charm! Can definitely recommend trying!

Participants: 5 >

Starts: Today >

Duration: 4 weeks >

Hours per week per person: 2 >

Impact: 10 people >

Total costs €50 >

Reminders: None >

Who can join? Accepted by me >

Join after start of project? No >

Invitation visible to: Anyone >

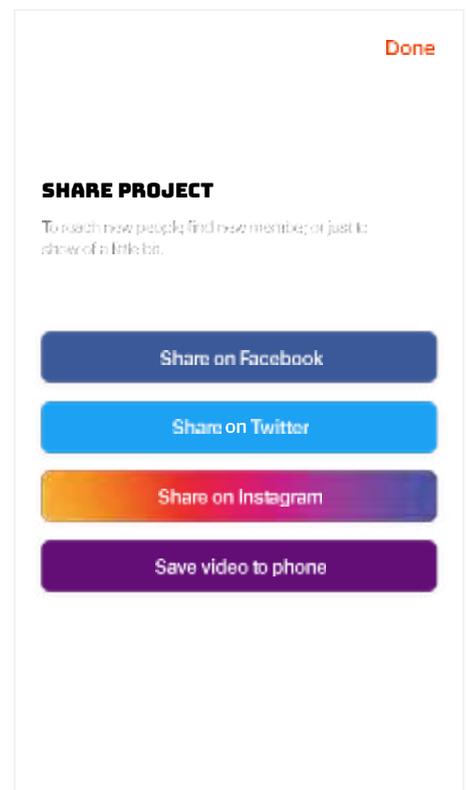
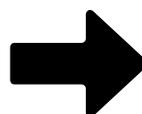
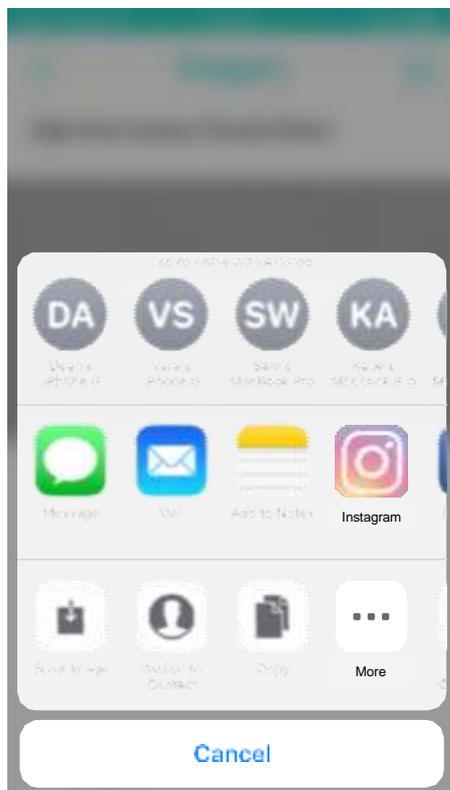
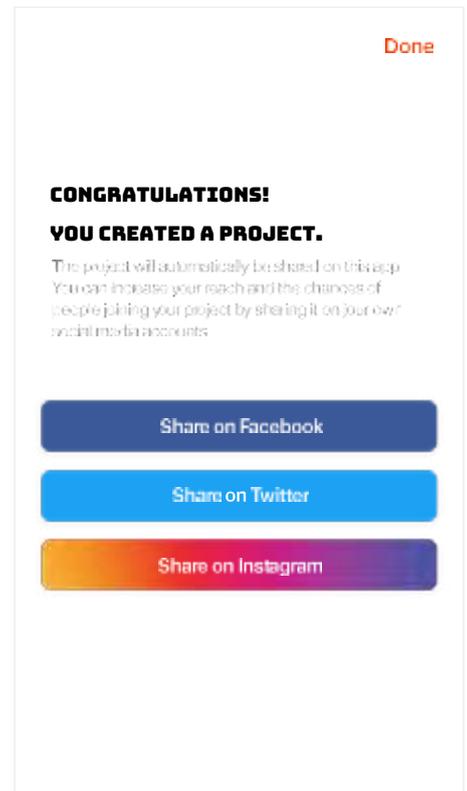
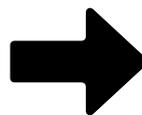
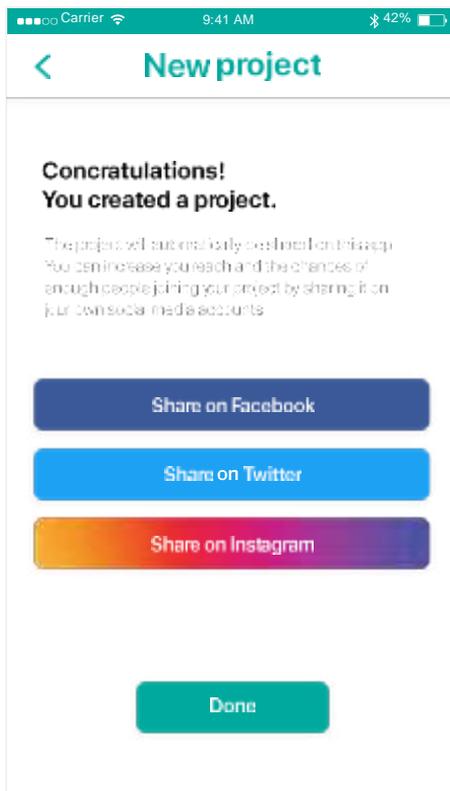


Tasks

- Buy small strawbale (not hay!) Day 1 >
- Place at final location Day 1 >
- Completely soak strawbale Day 2 >
- Keep strawbale wet through and through Day 2, repeats every day, stops after 3 times >
- Fertilize with organic fertilizer Day 4, repeats every day, stops after 3 times >
- Fertilize with half the amount of fertilizer Day 4, repeats every day, stops after 3 times >
- Add calcium to correct the pH value Day 11 >
- Keep strawbale wet Day 11, repeats every day, stops after 11 times >
- Check that temperature is under 20°C Day 11, repeats every day, stops after 11 times >
- Spread 3 cm of soil on the strawbale Day 21 >
- Put seeds in soil Day 21 >
- Make the soil wet Day 21 >
- Put potted plants in the side of the bales with some soil Day 21 >
- Check on plants and water if necessary Day 21, repeats every day >

[+](#)

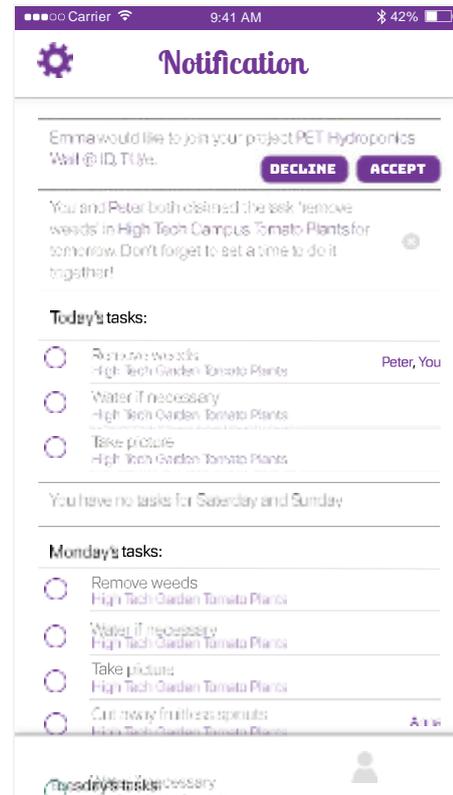
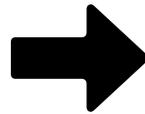
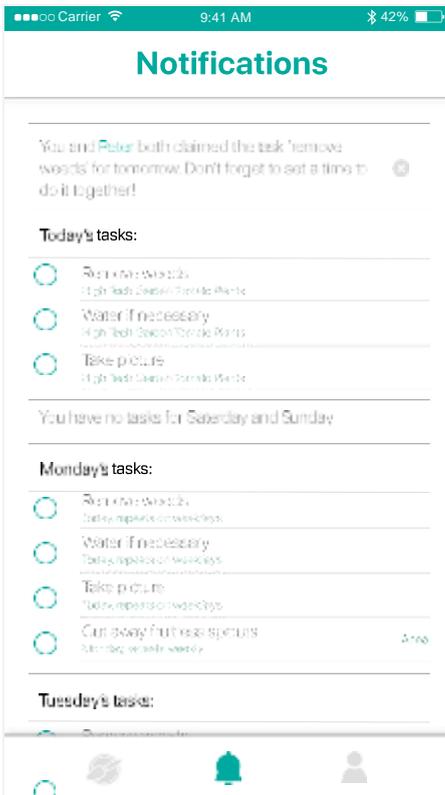
PUBLISH



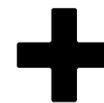
The sharing procedure for new and imported projects remains the same.

After creation, projects can be shared in the same ways. Additionally, the video can be saved directly to the phone, so the user can do with it as they please.

Notifications



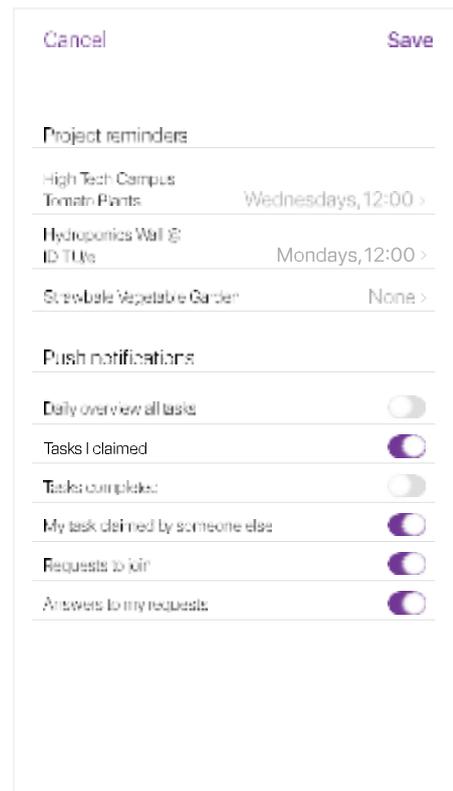
The different sections of the app now have different colours to increase the ease of navigation. It also makes the app a bit more dynamic.



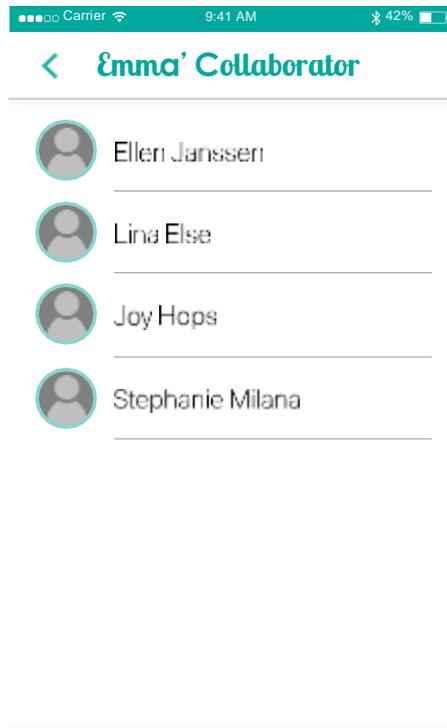
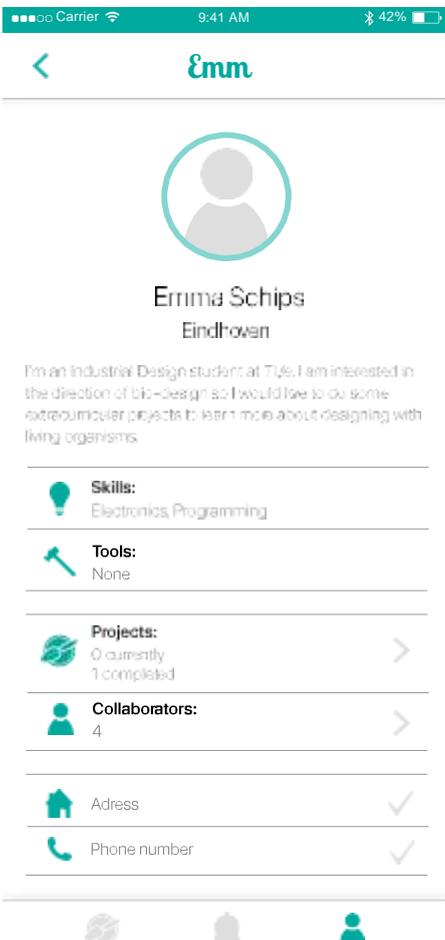
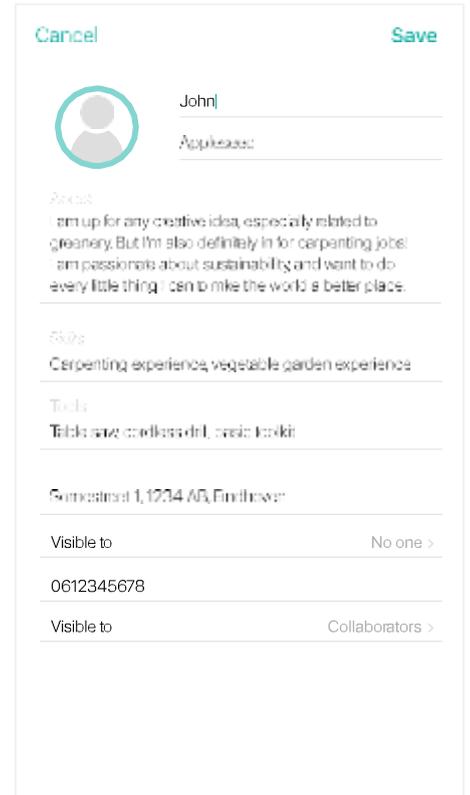
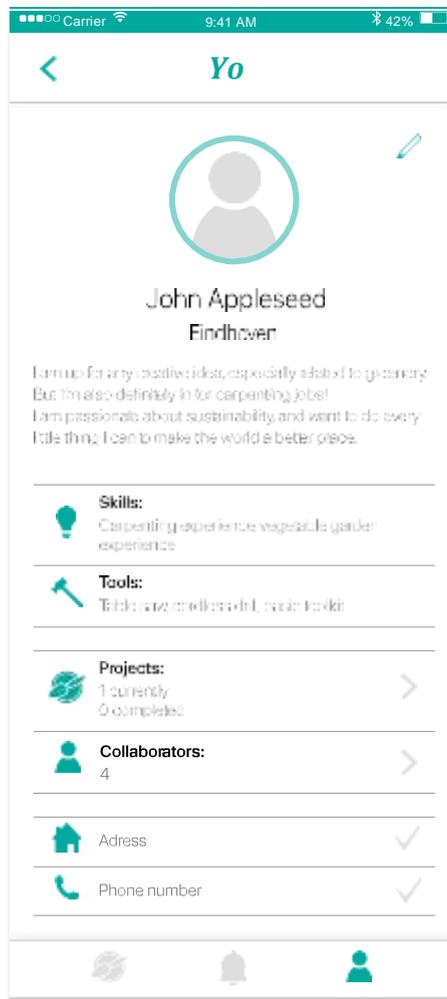
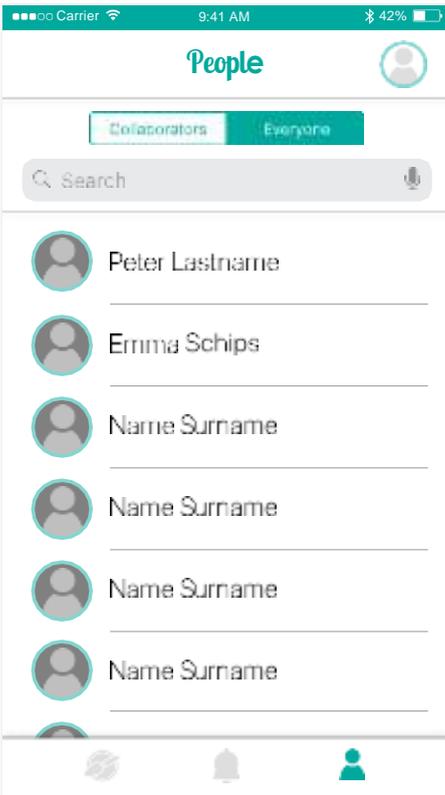
The notifications page was rated quite low during the user test at a 6,4. It does remain in a quite similar form though, because once again, this page may prove to be more useful than anticipated in practice. Especially when users are working on multiple projects at once, it can save some time skipping from project page to project page to access all tasks and notifications.

Tasks always show what project they belong to so that users can quickly access the project page to take a picture.

Notification settings were added so that users can specify what reminders they want to receive.

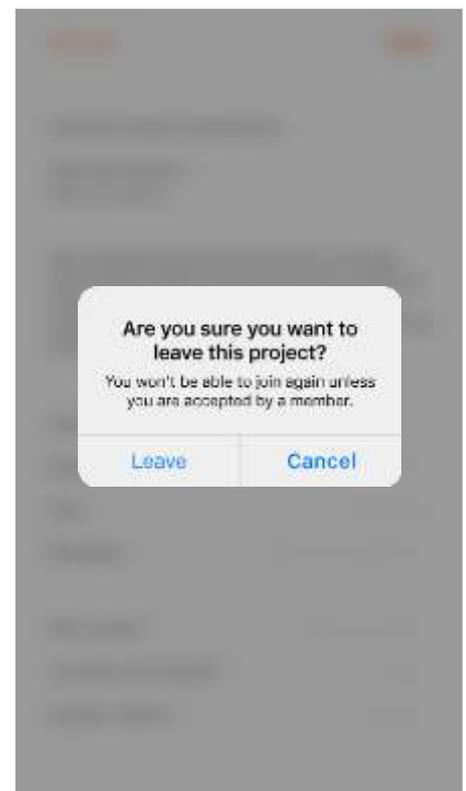
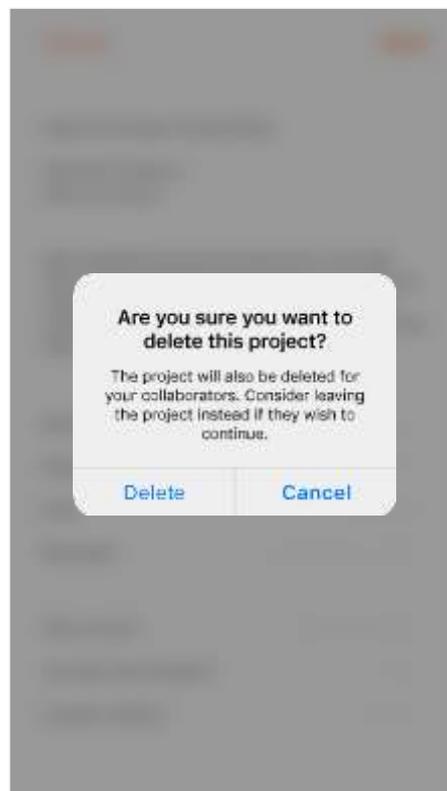
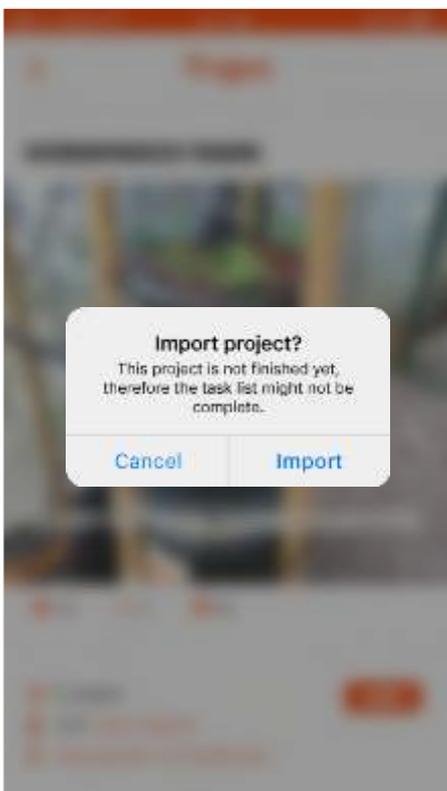
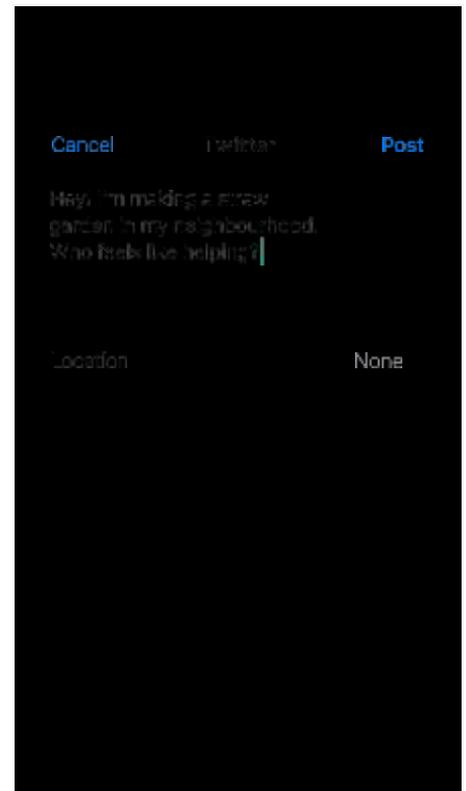
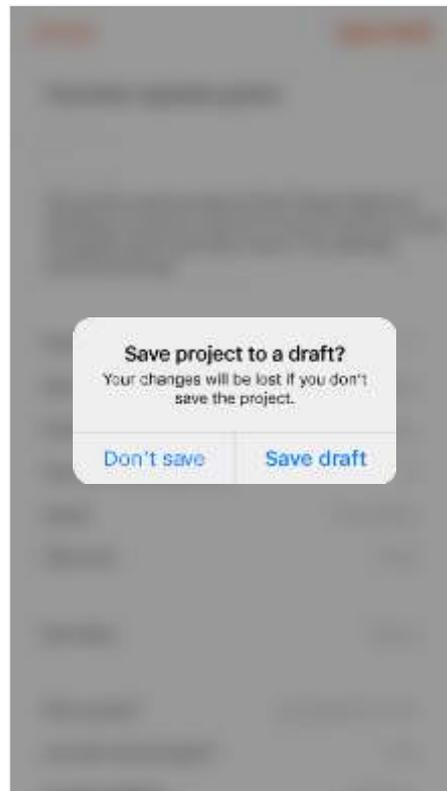
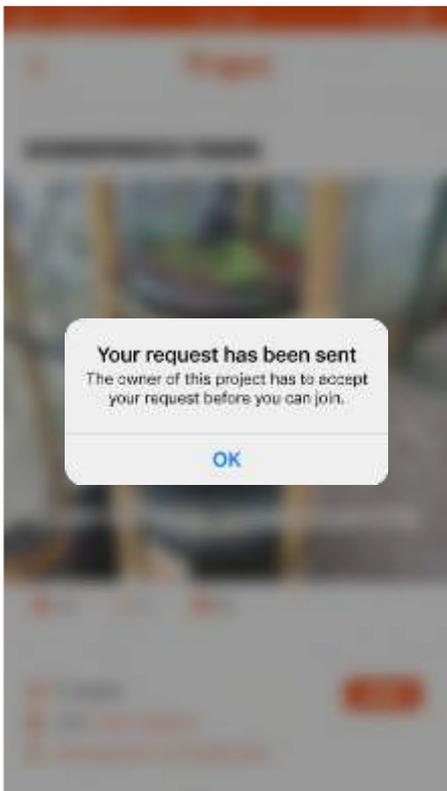


PEOPLE



No changes other than the addition of some screens that weren't previously modelled.

POP-UPS



No changes to speak of, some additional screens.

APPENDIX E – SECOND PROTOTYPE

An interactive version of the second prototype can be found here:

<https://xd.adobe.com/view/1620424c-0d05-463c-a815-fc7bf7412b39>

Note: Not all photos used in the prototype are my own.

The picture of a young tomato plant was retrieved from <https://kiza.eu/art/image/869>.

The picture used for ‘Community Vegetable Bed’ is property of Buurttuin Breda.

The strawbale vegetable garden was retrieved from: <http://oldstreettown.com/wordpress/vijf-voordelen-en-een-nadeel-van-tuinieren-op-strobalen/>

The second picture of a young tomato plant is also not mine. Unfortunately I was unable to find the owner to credit them properly.

The PET hydroponic wall is a still from this video: <https://www.youtube.com/watch?v=9B2Yyvm5A5I>

The picture used for ‘Edible Public Park’ was retrieved from: <https://www.eet-baarnijmegen.nl/moerbeiplantsoen/>

The picture used for ‘Community Garden in the Fields’ is property of High Tech Campus.

APPENDIX F – FEEDBACK STEFAN PFUNDTNER

To whom it may concern,

My name is Stefan Pfundtner and I'm one of the initiators of a community garden at the High Tech Campus in Eindhoven.

In early October of 2017 I got approached from Linde via email, who had found our website. She introduced her ideas around a concept to make the gardening experience more interactive. The garden had become less and less active over the years and her ideas fitted right into our ambition to re-activate the garden.

The initial goals Linde shared with me were:

- Motivating people to contribute to a shared urban farm
- Educate people about sustainability-aspects of food production and reconnect them to the food production process
- Help people to complete farming tasks in the right way at the right moment
- Connect people using the inherent cycle of farming

I mention them here to also highlight how they changed throughout the course of the project based on the insights Linde gathered around the challenges and needs of a real-life community garden.

Through Linde's drive we quickly agreed to have a first meeting. Linde introduced the scope of her which would be part of her final bachelor project for industrial design. She set expectations right from the start that the limited time available would be sufficient for a concept design and some "test-runs" with the gardening community.

In our first meeting – which happened in the garden – Linde was eager to learn about the implementation process and our experience with interacting with the community. The community being not just the active gardeners, but also the many people working daily on the HTC campus.

We quickly came to the conclusion that we wanted to gather input from as many stakeholders as possible. Linde prepared some questionnaires to distribute and we fixed a date to gather feedback on a first prototype in the garden. The feedback session took then place on November 10 for which Linde prepared paper mockups of a potential app and she could gather some feedback from garden community members invited and people passing by.

Finally Linde also prepared an interactive online mockup of the app – incorporating the feedback received in the first session – that gave a really good impression of the experience of such an app.

I was really happy with the concept Linde came up in the limited time. She arrived at the stage where a next step would involve real-life implementation with suitable projects. I see a lot of excellent use cases not only for gardening, but for any community project in the urban setting. I could imagine that it would be an excellent tool for e.g. municipalities to engage with the community and foster more healthy fruitful interaction among citizens.

The High Tech Campus garden community wishes Linde a lot of success and is thrilled to witness a potential continuation of her idea.

Warm regards,
Stefan Pfundtner

APPENDIX G – CODE PROCESSING SKETCH

The processing file and supporting files can be downloaded here:

<https://drive.google.com/file/d/1Zc6t8spOFm4dCKZa1kWb0YVYybkiQz3l/view?usp=sharing>

CODE

```
import processing.video.*;

//Define variable to keep track of the amount of pictures taken
int i = 0;
//Define variable for retrieving pictures
int x = 0;
//Define integer for navigating screen, default to screen 1 when first starting sketch
int screen = 1;

//Make a new cam
Capture cam;

//Define variables for the measurements of the buttons
int circleX, circleY, circleRadius;
int rectX, rectY, rectWidth, rectHeight;
int barLeft, barPos, barLength, barHeight;

//Define booleans to determine whether the mouse is over a button
boolean circleOver = false;
boolean rectOver = false;
boolean barOver = false;

void setup() {
  frameRate( 30 );
  //Frame is the size of an iPhone
  size( 375, 667 );
  //Connect to the iSight camera of the laptop
  cam = new Capture( this, "name=FaceTime HD Camera,size=1280x720,fps=30" );
  cam.start();

  //Define the locations of all buttons
  circleX = 187;
  circleY = 550;
  circleRadius = 70;
  barLeft = 60;
  barLength = 255;
  barPos = 187;
  barHeight = 625;
  rectX = 325;
  rectY = 10;
  rectWidth = 40;
  rectHeight = 80;
}

void draw() {
```

```

//See if the mouse is hovering over a button and update the booleans accordingly
update( mouseX, mouseY );

//If necessary, go to the camera screen
if ( screen == 0 ) {

    if ( cam.available() ) {
        cam.read();
    }

    //Show the camera capture
    image( cam, -(1280-375)/2, 0 );

    //If a previous picture exists show that image at the opacity determined by the slider
    position
    if ( i != 0 ) {
        PImage lastIm = loadImage( "img" + (i - 1) + ".jpg" );
        //Set opacity of overlay image
        tint( 255, barPos-60 );
        image( lastIm, 0, 0 );
        //Set opacity back to full
        tint( 255, 255 );
    }

    //Draw the take photo button
    noFill();
    stroke( 255 );
    strokeWeight( 10 );
    ellipse( circleX, circleY, circleRadius, circleRadius );
    //Draw the exit button
    stroke( 255 );
    strokeWeight( 5 );
    line( 335, 20, 355, 40 );
    line( 355, 20, 335, 40 );
    //Draw the opacity slider
    strokeWeight( 10 );
    line( barLeft, barHeight, barLeft+barLength, barHeight );
    ellipse( barPos, barHeight, 20, 20 );
} else if ( screen == 3 ) { //If necessary go to the project page and play back the video

    //Load and display taken picture
    PImage im = loadImage( "img" + x + ".jpg" );
    image( im, 0, 0 );
    //Load and display the interface project page
    PImage im2 = loadImage( "template project.png" );
    image( im2, 0, 0 );

    //Update x to move to the next picture
    x++;
    //Make sure the stop motion starts again after the last picture
    x = x % i;
} else if ( screen == 1 ) { //If necessary, go to the project page displaying the default
picture

    //Load and display default picture
    PImage im = loadImage( "default.jpg" );

```

```

    image( im, -100, 140 );
    //Load and display interface project page
    PImage im2 = loadImage( "template project.png" );
    image( im2, 0, 0 );
  }
}

//Reads an image from the camera
void movieEvent( Movie m ) {
  m.read();
}

void mouseClicked() {

  //If the photo button is clicked, take a picture
  if ( circleOver && screen == 0 ) {
    ;
    //Save the camera image without buttons
    image( cam, -(1280-375)/2, 0 );
    saveFrame( "data/img" + i + ".jpg" );
    //Increase i so that next picture will be saved to a new file
    i++;
  } else if ( rectOver && screen == 0 ) { //Exit to default or timelapse project page if
exit button is clicked

    //Go to default if no pictures have been taken
    if ( i > 0 ) {
      screen = 3;
    } else {
      screen = 1;
    }

    //Set frame rate to 3 so timelapse will have the correct speed
    frameRate( 3 );
  } else if (rectOver && (screen == 1 || screen ==3 )) { //Go to camera screen when camera
button is clicked

    screen = 0;
    //Set framerate to 30 for smooth capture
    frameRate( 30 );
  } else if ( barOver && screen == 0 ) { //Set slider position if mouse is clicked over the
opacity slider
    barPos = mouseX;
  }
}

//Sets slider position if mouse is dragged over the opacity slider
void mouseDragged() {
  if ( barOver && screen == 0 ) {
    barPos = mouseX;
  }
}

//Updates updates booleans according to whether the mouse is over a button and if so which
void update( int x, int y ) {
  if ( overCircle( circleX, circleY, circleRadius ) ) {
    circleOver = true;
  }
}

```

```

    rectOver = false;
    barOver = false;
} else if ( overRect( rectX, rectY, rectWidth, rectHeight ) ) {
    circleOver = false;
    rectOver = true;
    barOver = false;
} else if ( overBar ( barHeight, barLeft, barLength ) ) {
    circleOver = false;
    rectOver = false;
    barOver = true;
} else {
    circleOver = false;
    rectOver = false;
    barOver = false;
}
}

//Determines whether the mouse is hovering over the slider bar
boolean overBar( int heightB, int leftB, int lengthB ) {
    if ( mouseY >= heightB - 10 && mouseY <= heightB + 10 &&
        mouseX >= leftB && mouseX <= leftB + lengthB ) {
        return true;
    } else {
        return false;
    }
}

//Determines whether the mouse is hovering over the take photo button
boolean overCircle( int x, int y, int diameter ) {
    float disX = x - mouseX;
    float disY = y - mouseY;
    if ( sqrt(sq(disX) + sq(disY)) < diameter/2 ) {
        return true;
    } else {
        return false;
    }
}

//Determines whether the mouse is hovering over the exit or camera button
boolean overRect( int x, int y, int width, int height ) {
    if ( mouseX >= x && mouseX <= x + width &&
        mouseY >= y && mouseY <= y + height ) {
        return true;
    } else {
        return false;
    }
}
}

```

APPENDIX H – VIDEO

You can find the video at:

<https://youtu.be/cP7MsXsGfmc>

