



**SiEUGreen**  
Sino-European innovative green  
and smart cities

# *D3.6*

## *COMURBAN*

### *software*

### *delivery*

SiEUGreen Project

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## 1. Introduction

The aim of this document is to present the methodology and the work carried out for the development of the “**commurban**” mobile application. “**commurban**” was developed in the framework of WP3 (Task 3.2 Showcase deployment) with the aim to promote urban and peri-urban eco-friendly farming techniques, increase social engagement and finally, strengthen EU-China collaboration. “**commurban**” will act as an effective tool for SIEUGreen showcase partners, in order to facilitate citizens' and community engagement and raise awareness about urban farming methods, urban resilience, food security and resource efficiency.

The “**commurban**” mobile application presents Do-It-Yourself (DIY) projects with step-by-step instructions regarding urban agriculture, smart balcony, greenhouses, community farming techniques, household waste recycling, etc, inspired initially by the research outcomes of SiEUGreen. The application is a crowd-sourced Do-It-Yourself archive, where users are able to upload their own DIY projects for the perusal of the community, along with media that better showcase their work, and present the challenges they faced during their implementation and how those were resolved. Users can also create and/or participate in community projects and interact with the members of the community. “**commurban**” is enhanced with the gamification feature, which is quite essential for bringing people into the application, and keeping them engaged with their projects, while helping increase social activity.

“**commurban**” is expected to bring attention to the general idea of urban agriculture, and raise awareness on the benefits it can have in citizens' everyday lives, and communities in general.



## 2. Design and Development of the “COMMURBAN” application

The basic specifications of the “*commurban*” application were identified through a number of internal discussions at project level, which are described at the “Inception report WP3 Showcase deployment – “*commurban*””. In particular, ViLabs, the WP3 leader organized a series of bilateral meetings and telcos, at a first stage with the leaders of Tasks closely linked to “*commurban*” in order to define the preliminary specifications, and at a second stage with the showcase partners so as to define the final specifications for the implementation. Since the purpose, the mission of the “*commurbna*” application and the initial user requirements were identified, the next step was CREVIS to proceed with the design of Users Experience (UX), the identification of user requirements, the design of User Interface (UI), and finally the development of the application. The whole process of designing the application was divided into 5 phases:

Phase No1: Understand – Evaluate

Phase No2: Research

Phase No3: Information Architecture and UX/UI Design

Phase No4: Gamification

Phase No5: Development

### 3. Phase No1: Understand – Evaluate

The main goal of this phase was to understand very clear the functionality of the “*commurban*” application, identify the user categories and the user tasks and analyze what users would get out of the application. Once all this information was identified, the evaluation process begun.



## 3.1 Understanding the “*COMMURBAN*” mobile application

Based on the preliminary specifications, an extensive discussion with WP3 leader, and interviews with stakeholders, CREVIS identified and analyzed three basic ontologies of the “*commurban*” application, 1) the users, 2) the DIY projects, 3) the steps of the DIY projects, and based on them designed the first wireframes.

### 3.1.1 The Users

Users could be individual persons, as well as companies, organisations, Municipalities, and any other legal entity. Users are divided into two categories:

- **Registered users:** users who have created an account
- **Non-registered users:** users without an account

The type of the account affects the actions that users can perform.

#### **Registered users:**

Registered users are able to:

- Follow DIY projects
- Like and comment on DIY projects
- Create their own DIY projects
- Participate in the gamification process
- Enroll into a project

#### **Non-registered users:**

Non-registered users can access the application, navigate through the projects and search for content. However, they are not able to perform actions such as create a project, comment, like, save, share, or enroll into a project, enjoy the gamification features and have access to screens that require a profile.

### 3.1.2 DIY Projects

The projects are defined as Do-It-Yourself (DIY) projects with step-by-step instructions regarding urban agriculture, smart balcony, greenhouses, community farming techniques,



household waste recycling, etc, uploaded by the users of “*commurban*”. Projects are divided into two categories.

- **Single projects:** DIY projects that can be created by any registered user
- **Community projects:** In order to increase collaboration among community members, users are able to initiate a community project, i.e. a community garden in their neighborhood. Other users can also join the project and work together to implement

it. This "cooperative approach" will form teams with people of different skills willing to work together and produce sustainable and/or healthy solutions which will affect themselves and the ones near them but also to the wider community.

The projects are divided into two categories, depending on whether they are completed:

- **Completed projects:** Projects that have been completed, and no more steps will be added to them.
- **Ongoing projects:** Projects that are still in progress and the author of the project will add more steps in the future

A project can be either **published**, or **saved** as a draft by the author for further editing.

### 3.1.3 Steps of the DIY projects

A DIY project consists of a number of steps that describe it. A step can be considered a sub-entity of a project. Each step consists of a brief description and media files, which accompany it.



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Based on the information above CREVIS created **“commurban”** s initial low-fidelity wireframes and converted them into medium-fidelity mockups. These screens presented the basic user requirements for the **“commurban”** application (Figure 1).

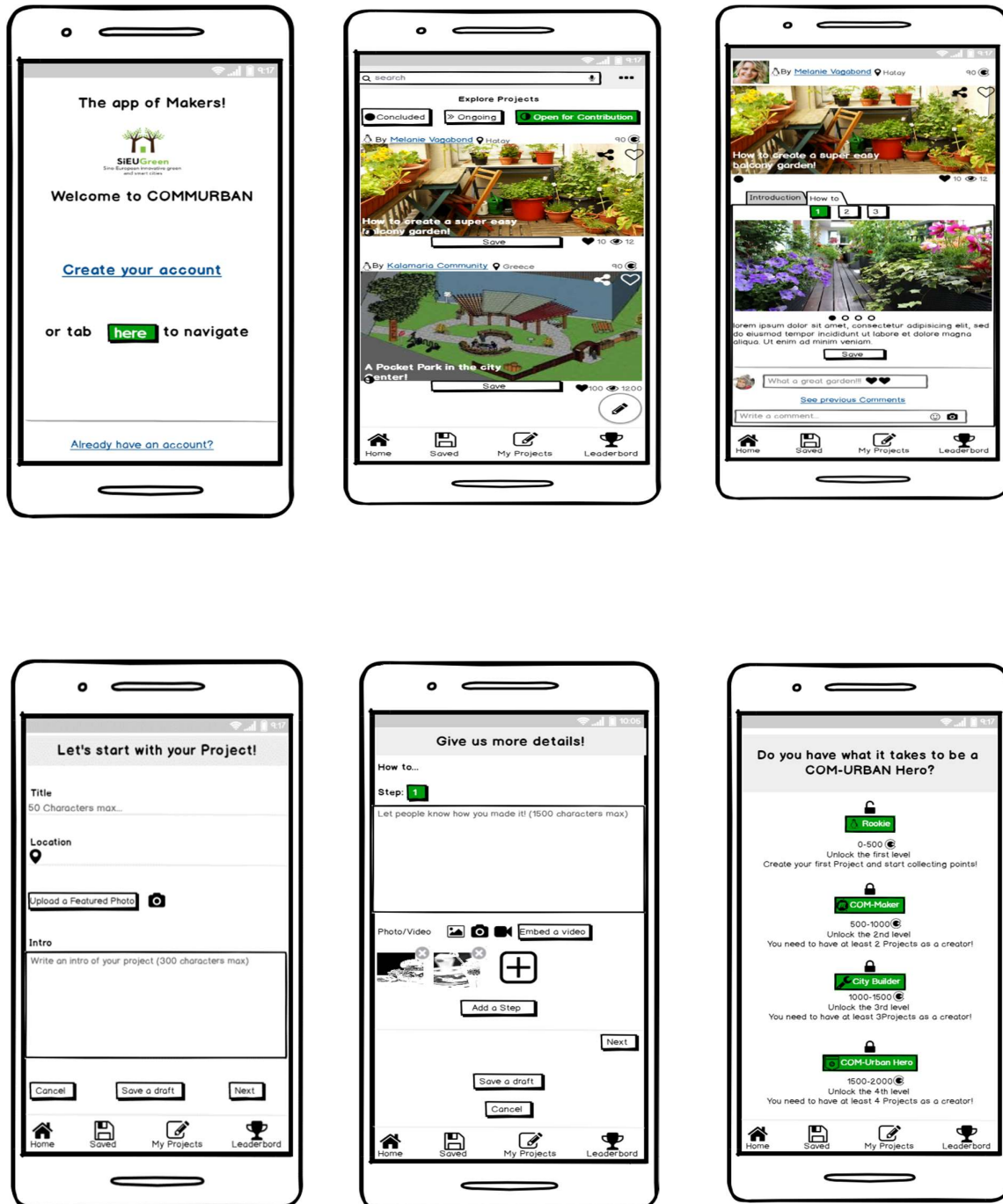


Figure 1, “commurban” initial mockups





## 3.2 Evaluation process

The evaluation of **“commurban”**’s initial medium-fidelity mockups is broken into 2 steps:

1. Partners’ evaluation & feedback
2. UX Experts Review

### 3.2.1 Partners’ evaluation & feedback

**“commurban”**’s initial mockups were presented to SiEUGreen partners during a workshop implemented in the framework of the “Trends Scanning Workshop”, organized by Emetris in November 2018 (M11), in Greece. Following the presentation, a comprehensive discussion followed and the partners provided CREVIS with their comments and feedback.

The main comments are summarized below:

1. *We should keep in mind that Facebook, or Google is not available in Mainland China.*
2. *We need to set a section for group discussion.*
3. *It is important that people can watch the project on a map (what are the context: urban, rural, city center or outskirts).*
4. *Make sure, we have some good examples before going on air. Start recruiting some users already now. Make contact on social media and ask them to upload their projects.*
5. *The inspiring part seems to me, that this is a cross border sharing platform. As a “commurban” person I can interact with other builders across the continent.*
6. *I think that one of our activities could be a gathering for city building COMURBAN people to meet in Aarhus for inspiration and sharing. Just an Idea.*
7. *Great pictures are a must.*
8. *Look at this maker-site as inspiration from Denmark. This is a community we have in Aarhus. <https://groselv.dk/diy-guides/>. They have a lot of guides to Do it yourselves. Not all are gardens, but the concept is very fine.*
9. *We should not ask users to fill in many personal information*
10. *We should have an easy registration process*



### 3.2.2 UX Experts Review

A team of experienced UX Researchers and Designers was assigned by CREVIS to review the application and provide feedback. A UX review is a usability-inspection method in which the reviewers examine the application to identify possible usability issues and determine whether it meets its objectives and provides a good experience for the user.<sup>1</sup> The members of the UX review team are quite experienced with a deep knowledge of usability best practices and they provided us with a fresh and unbiased perspective, since they were not involved in the creating process.

For the purposes of the UX review we quantitated the 5 most important factors:

- Content,
- Functionality,
- Navigation,
- Feedback,
- Presentation.



Figure 2, UX Experts Review

As it is presented in the charts, the positive findings and the minor issues gather a total of almost 70%. However, a number of issues were identified mainly during the navigation process. As it was stated the navigation occupied a lot of screen space, grabbed users'

<sup>1</sup> <https://www.nngroup.com/articles/ux-expert-reviews/>



attention, it was confusing and interfered with the users' ability to discover "*commurban's*" features fast and easy.

## 4. Phase No2: Research

During this quite crucial phase we performed a field research in order to identify the applications that are already in the market, as well as an extensive user research so as to better understand our user's thoughts and needs.

### 4.1 Field Research

A thorough online field research was conducted for mapping similar DIY applications, investigate how they meet user needs and identify potential usability problems. We also paid extra attention to the reviews of each application, since the most common method for identifying user requirements from competitor analysis is through product online reviews (Jin et al., 2016). There are many applications for creating and presenting DIY projects, and several regarding gardening ideas, planting, home gardening, creative recycling, etc, but there is none that combines "*commurban*"'s features and none that gives users the opportunity to create and participate in community projects. We downloaded a number of applications and navigated through them in order to identify how they work and what they offer to their users.

Additionally, in order to meet user requirements more effectively we conducted an extensive research to find people who already use similar applications, as well as the people who are engaged in activities that could be included in "*commurban*" as DIY projects, but they have never used an application to present their work. We identified a number of citizens' initiatives concerning urban farming, pocket parks, etc, and we contacted their representatives in order to discuss with them and invite them to participate in the Stakeholders Interviews and the Personas Workshops that we would organize in the framework of the UX design.



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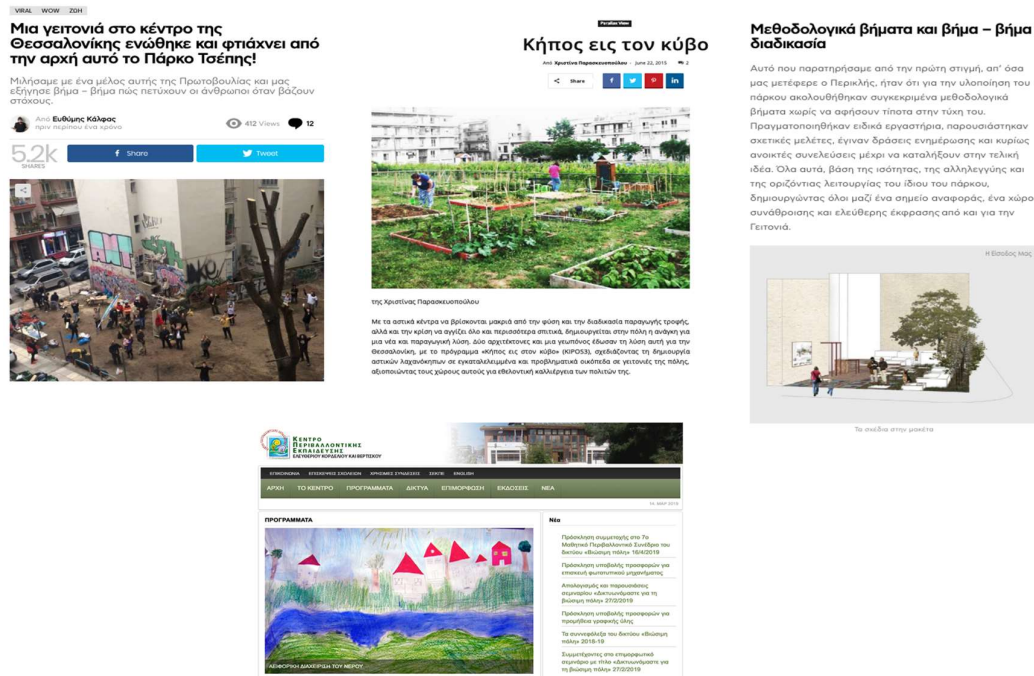


Figure 3, Citizen's Initiatives regarding urban farming

## 4.2 User Research

The user research is the basic way to gain insights into user behaviors, needs and motivations and to understand what is useful to them, since it brings to the narrower information, which are important for designing an exceptional and effective user experience. The user research included three basic steps:

1. Stakeholders Interview
2. Personas Workshop
3. User Journey Maps

### 4.2.1 Stakeholders Interview

In the framework of this task, 15 interviews with stakeholders were organized, during which CREVIS presented “*commurban*”’s concept and goals in order to get stakeholder’s opinion and feedback. We chose a qualitative method for our interviews in order to understand the current usage (if any), the current problems, the needs and the issues.

Some of the main takeaways were:

“It’s about urban farming: produce food, cultivate and promote a zero-waste culture”



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“We need to focus on urban farming: how can we use public open spaces for urban farming”

“DIY: Learn how to grow your food”

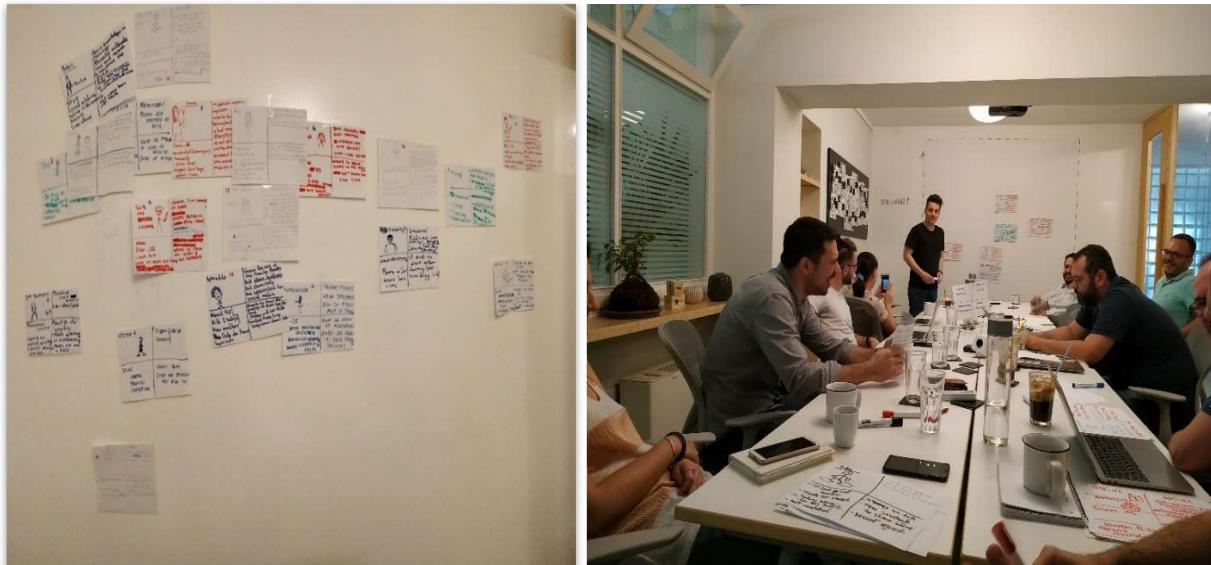
“The goal is to engage citizens in urban farming”

“**commurban**” is the mean to create citizens’ communities”

“Urban farming gets you out of your comfort zone”, “it’s an activity”, “it’s a hobby”, and “a way of living”

#### 4.2.2 Personas Workshops

Personas are descriptive models of archetypal users derived from user research. They are formed using characteristics of people who present similar goals, motivations and behaviours. They have a supportive role in order to describe and highlight differences between goals and behaviours (Saffer, 2007). Consequently, they enhance realism and increase engagement in a design team with end user representations (Marshall et al., 2015). The process of creating different personas together with the stakeholders helps the design team to develop empathy with the users and to better understand their needs. Two Personas Workshops were organized, where CREVIS team, together with the stakeholders tried to create reliable and realistic descriptions of the key audience segments.



*Figure 4, Personas Workshop*

The nine personas presented below were created in the framework of the workshop. Each persona has different profile, characteristics and needs. Descriptions for each persona are available in Annex 1.

- Business
- Community
- Education
- Public Sector
- Activist
- Health Conscious
- Hobbyist
- Opportunity Seeker
- Socializer

### 4.2.3 User Journey Maps

A user journey is a timeline presenting a series of steps a user may take to reach their goal inside an application. Mapping different user journeys is a quite impactful technique, which helps UX experts visualize users' interaction within an application and gain insights on their experience when using it. Typically, it is presented as a series of steps in which a person interacts with a product. The scope of the user journey map can vary, depending on the



persona and the purpose of using the application (for instance, create a DIY project, a community project, a profile account, etc.)

In order to create the user journeys, we used the personas and all the information we had already gathered from the workshops and the stakeholders' interviews, and for each persona we defined a user scenario with different expectations according to its special characteristics and needs. Then, we created a list of user actions and interactions with the application trying to understand users' experience journeys and identify the critical stages and points of these paths.

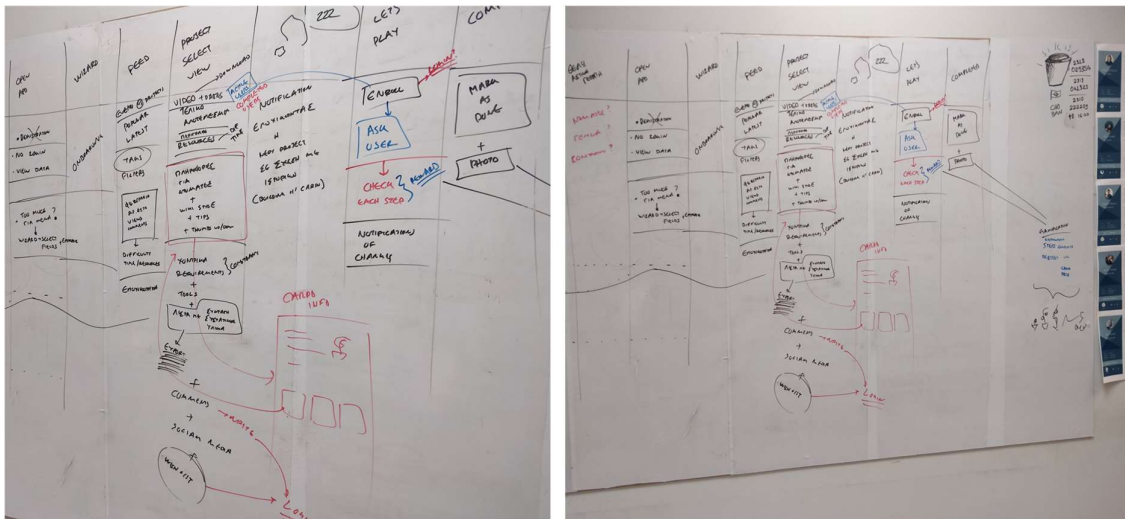


Figure 5, User Journeys

Figures 6 and 7 demonstrate the behavior of the users when they experience their journey in the application. The blue boxes present the actions of the users, together with some of their comments, while the green boxes present some of the positive findings/users' useful comments and the pink ones the parts where users met some difficulties, didn't understand what they had to do, or were not very satisfied with some of the actions (for instance, they had to login in order to save a project they liked).

In the figures below, we present journeys of users who downloaded the application for the first time (Figure 5) and journeys of users who wanted to create a new project (Figure 6). The red line (Figure 5) presents the journey of a user, who is not willing to register in order to navigate through the application and decides to quit the process and uninstall the application. The blue line presents the fluctuations on users' behavior while performing each action and while interacting with the application. We performed the user journeys several times trying to identify the different users' behaviors while using the application, (for instance get bored,





stop using the application, get excited, feel proud once they achieve a goal, etc) and we tried to find out ways to keep them engaged and interested in the application (for instance send them notifications concerning new projects of their interest, use gamification techniques to increase their satisfaction, etc).

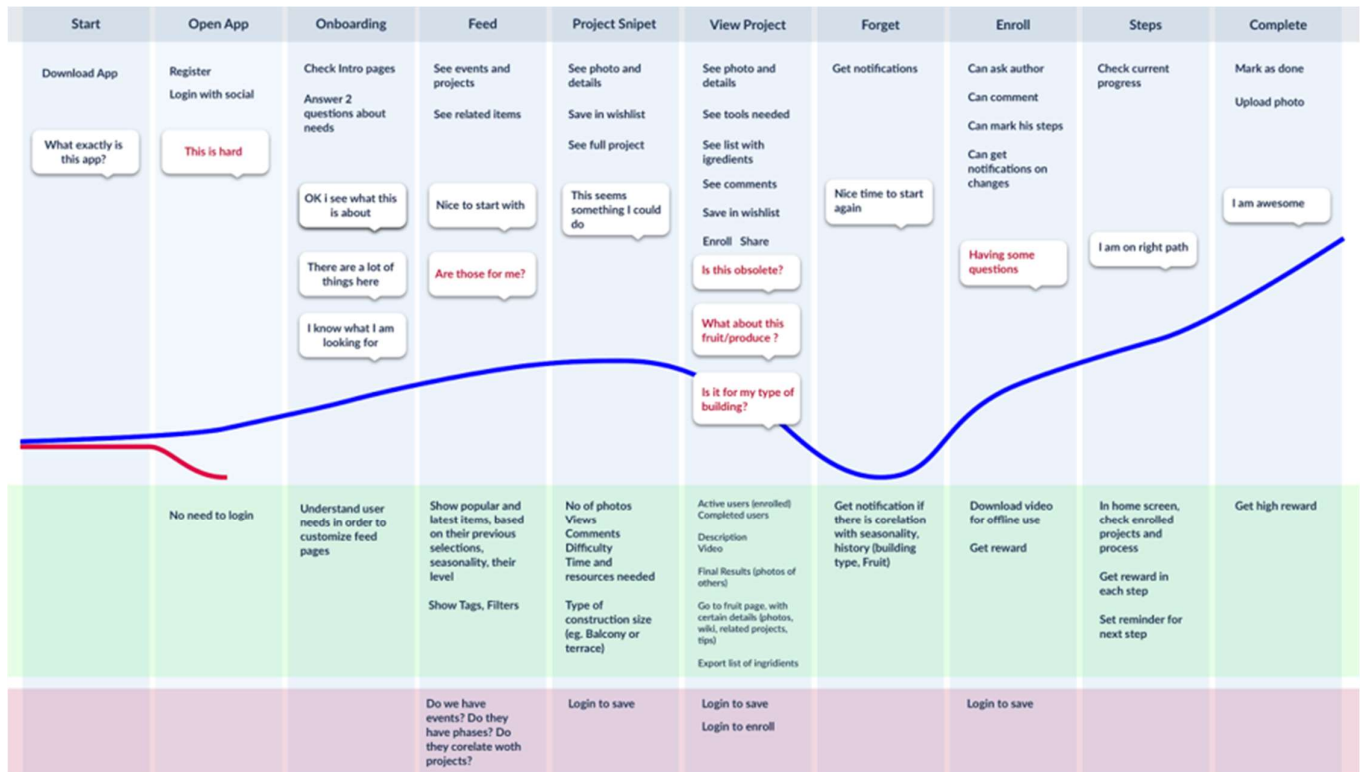


Figure 6, Users Journeys when downloading the application



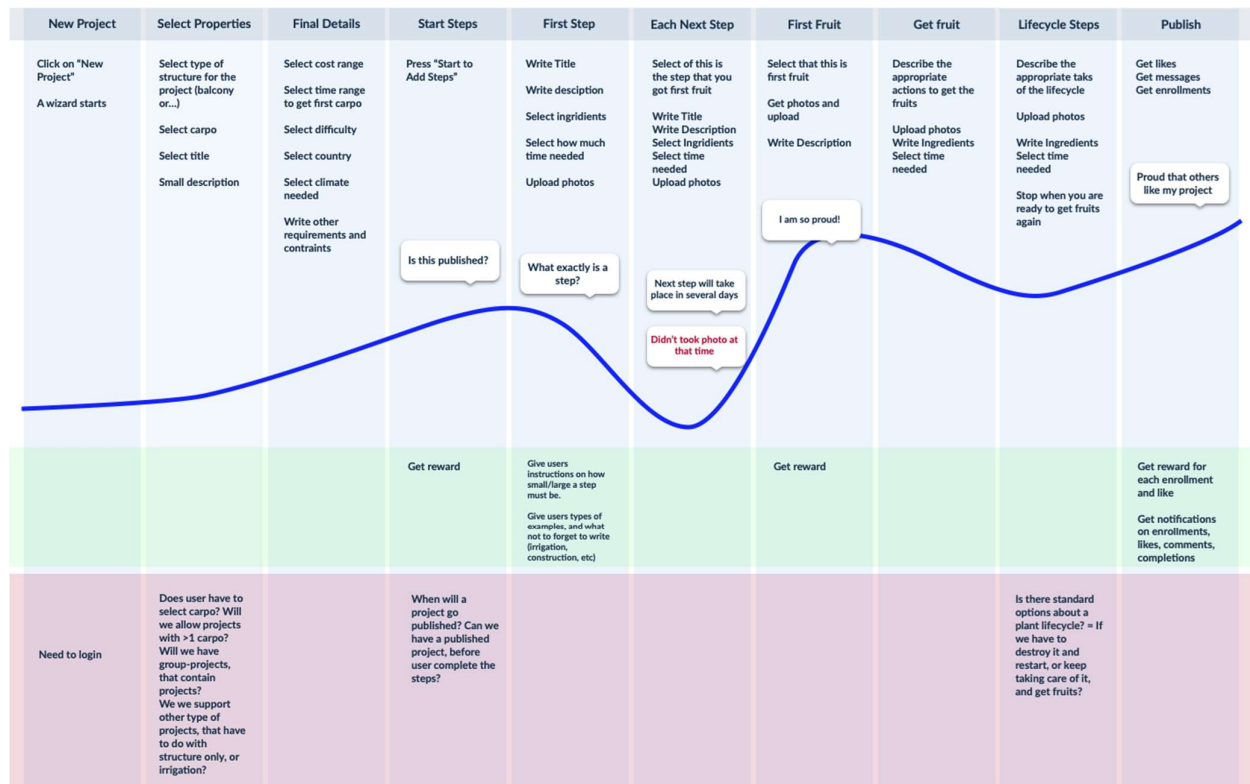


Figure 7, Users journeys when creating a new project

## 5. Phase No3: Information Architecture and UX/UI Design

This is the last phase of the UX design and the phase related to the design of the UI, which includes the steps below:

- Information Architecture & UX Design
- UI Design
- Evaluation - Usability Tests
- UI Design - Final Prototypes

### 5.1 Information Architecture & UX Design

The goal of the Information architecture (IA) is to organize, structure, and label the relevant content in an effective and sustainable way, so as to help users find the information they are looking for and to complete the tasks they undertake. In order to create an effective IA we



had to prioritize all the information blocks, select the important data and the right action flows. The first step was to understand how the pieces of the information fit together, how items relate to each other and then create the larger picture of the action flow. In order to do that we run sessions with real users based on the Card Sorting method aiming to understand their mental model and how they see the product's world with their eyes. Card sorting is a UX research method in which study participants group individual labels written on notecards according to criteria that make sense to them. This method uncovers how the target audience's domain knowledge is structured, and it serves to create an information architecture that matches users' expectations.<sup>2</sup> All the information was gathered in order to select the final information structure, the work flow and the microcopy. "Microcopy" is the term for the small text or sentences users see on the user interface of an application. Microcopy plays a crucial role in users' experience since it helps them better understand the workflow of an application and differentiates a good product from a great one.

Based on the research findings and all the information gathered we created the characteristics of the final entities and the users' tasks (mini journeys) while using the "*commurban*" application. The entities are described below, while the users' tasks are available in Annex 2.

### **"commurban" Entities**

We define four basic entities:

#### **1. User**

Users are divided into two categories and according to their category they can perform specific activities inside the application.

- Registered
- Non-registered

A registered user can enroll in a project, create a project (author), or participate as contributor in community project.

- Enrolled user
- Author
- Contributor

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<sup>2</sup> <https://www.nngroup.com/articles/card-sorting-definition/>



## 2. Project

Projects are divided into two categories according to their status.

- Completed projects
- In progress projects

At the same time, a community project that is in progress may be open for contribution, so that other users may participate as co-authors.

- Projects open for contribution

## 3. Step

A step can be considered as a sub entity of a project. A project consists of multiple steps. The steps are subdivisions and include text information (description) and media files (photos, videos).

## 4. Community Project

A community project can be considered a super-entity of a project, as it may consists of many projects with their own title and description.

Based on evaluation, the research data, and the information presented above, step-by-step we designed “*commurban*”’s low-fidelity wireframes (Figure 8).

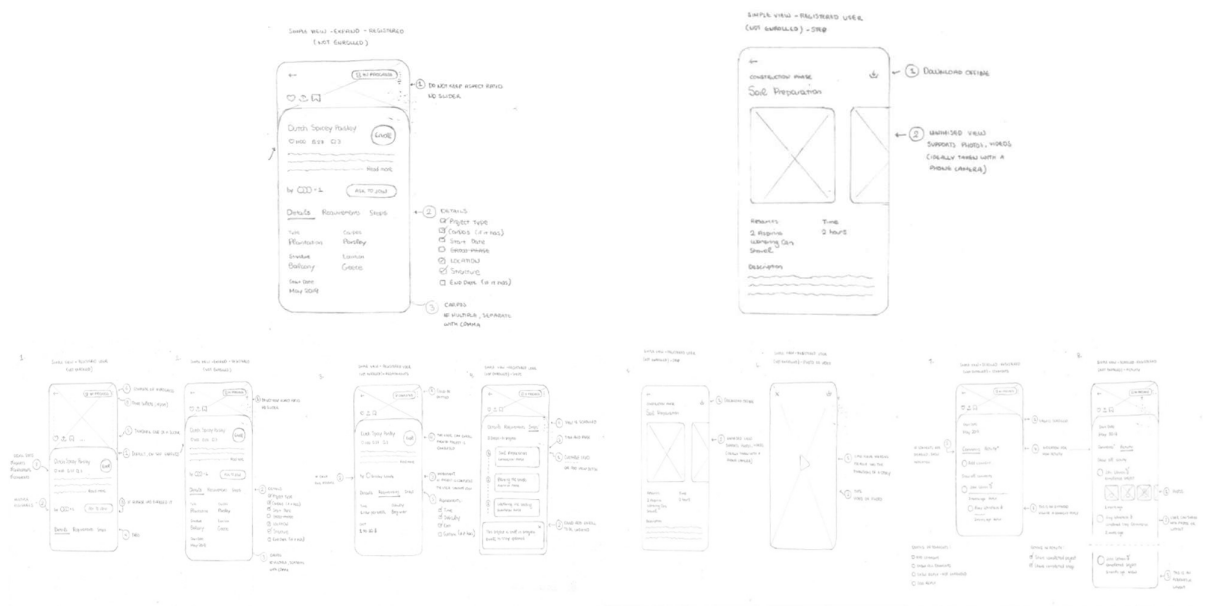


Figure 8, Low Fidelity Wireframes



## 5.2 UI Design

This step included the development of **“commurban”**’s character. At first, we had to build **“commurban”**’s logo and carefully select the color schemes. Then, we built the user interface, which represents the graphical layout of an application, i.e. the buttons users click on, the text they read, the images, sliders, text entry fields, and in general all the items users interact with.

### 5.2.1 The **“COMMURBAN”** Logo

We decided to create a logo in green color with curves in order to give a sense of harmony and send a positive emotional message to **“commurban”**’s users. The shape we use represents the frame of a house and the leaf inside reflects the combination of urban resilience, nature and environmental quality. We created a number of logos with different colors, in different versions (Figure 10), and asked for stakeholder’s opinion before we select **“commurban’s”** logo (Figure 9).

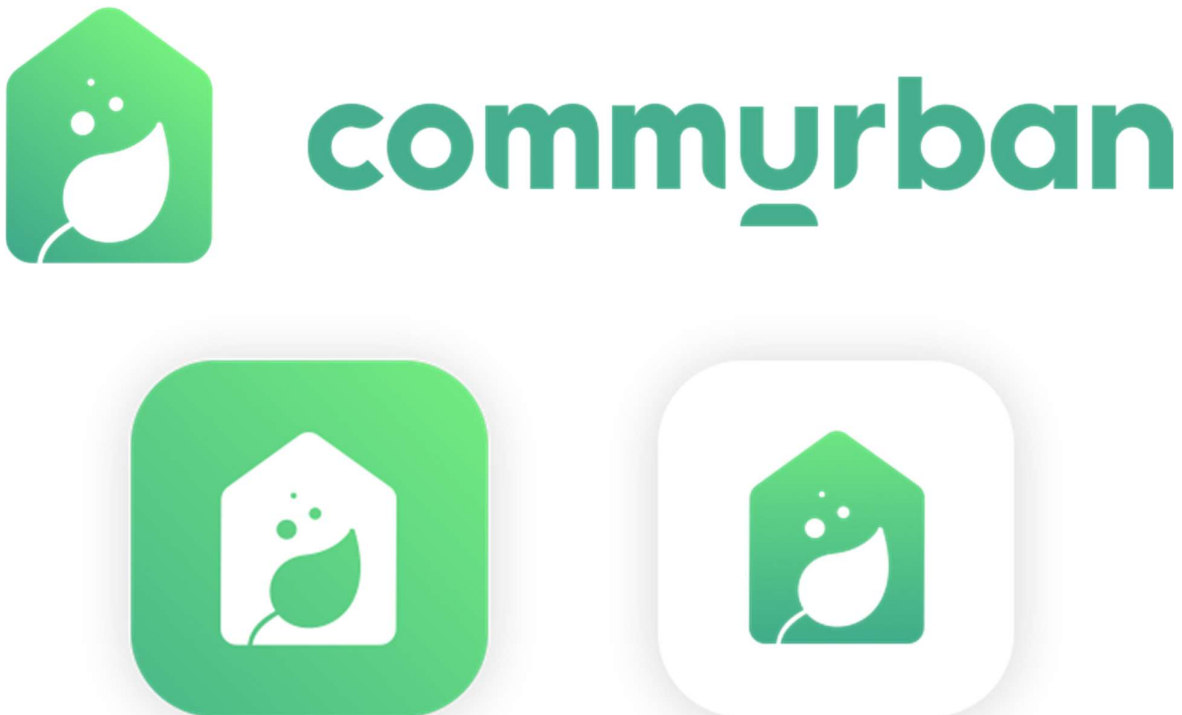


Figure 9, **COMMURBAN** logo



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Figure 10, **COMMURBAN** logo proposals

One of the most important parameters when designing an application is Inclusiveness. Inclusive design creates products that serve as many people as possible and enables people with diverse characteristics to use the product and get the experience out of it. The “**commurban**” application was created according to the Web Content Accessibility Guidelines (WCAG) 2.0<sup>3</sup>. Additionally, “**commurban**”’s color pallet that is used in the logo and the UI elements, was selected very carefully after a number of tests with different backgrounds, and

<sup>3</sup> <https://www.w3.org/TR/WCAG20/>



color combinations (Figure 11) in order to find the ideal color pallet that does not confuse people with color blindness<sup>4</sup> and also serves our UI design needs (Figure 12).

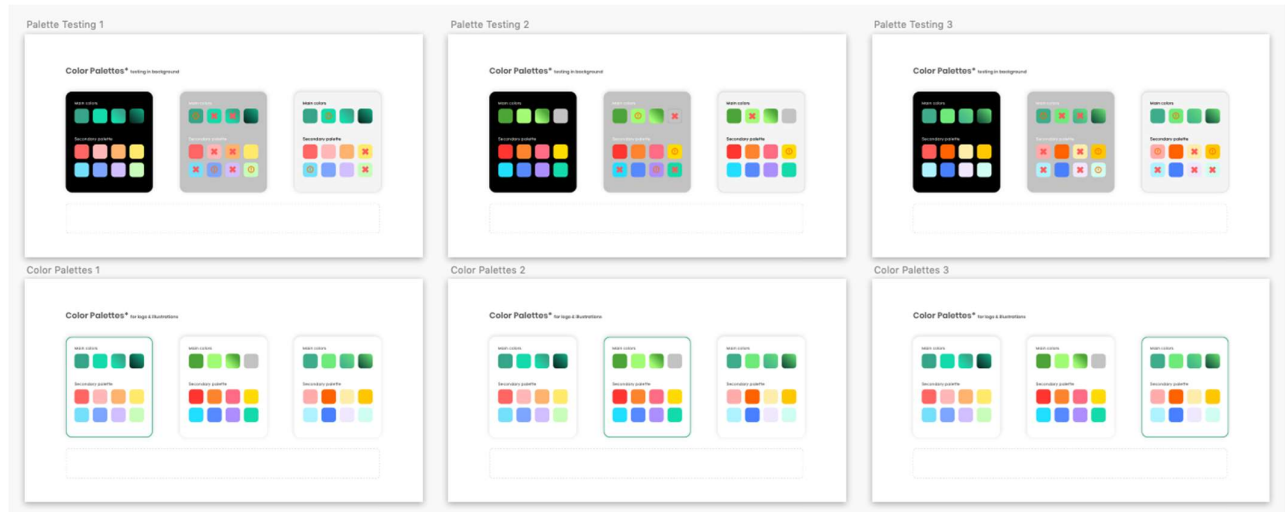


Figure 11, Color palettes' testing



Figure 12, **COMMURBAN** color pallet

### 5.2.2 The first Mockups

Since we had chosen "**commurban**"'s logo and color pallet we converted the low-fidelity wireframes, to medium-fidelity mockups, which were necessary for the next cycle of the user centered design process. Using the [Overflow](#) tool we created users' screen journeys and we

<sup>4</sup> [https://en.wikipedia.org/wiki/Color\\_blindness](https://en.wikipedia.org/wiki/Color_blindness)



built an interactive mockup from the very beginning. This helped us go through all the user journeys more easily and visualize all the user paths.

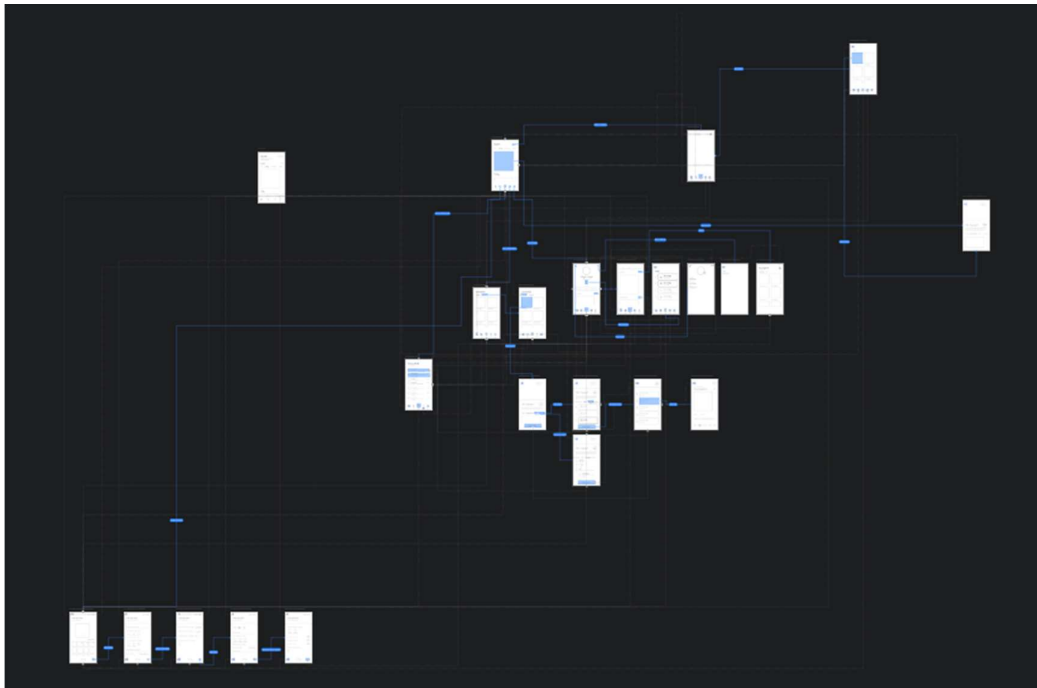


Figure 13, A view of the Overflow tool

## 5.3 Evaluation - Usability Tests

The evaluation is the most important phase of the UX and the UI design. In the framework of this phase we organized a number of Usability Tests, as we call them, during which we invited real users to use the application, and provide us with feedback. We run the tests in small groups each time, so as to quickly identify the most important issues.

The purpose of these usability tests was to observe:

### - User behavior

- Task performance
- Efficiency
- Expectation matching

### - User Opinion

- How it looks



- Thoughts and opinions

In terms of functionality, special attention was given to the following points:

- Main menu options, navigation through the application
- How to create a project
- How users add steps in a project

The users had to follow a given Scenario (Tasks):

1. Open the application
2. Profile navigation
3. Navigate to all the menu options
4. Navigation in Explorer
5. Select a project
6. Navigate to the project screen
7. Project creation navigation
8. Project creation process
9. Process of adding steps to a Project

These usability tests provided us with useful information, since we had the chance to listen to real users' thoughts, watch them while they were using the application and observe how they were interacting with it. Through these sessions we gathered a number of positive findings, such as that the users performed very quickly and effectively the given tasks, they liked the UI, the logo, the colors and the UI elements, they understood what they had to do in order to navigate through the application, create a project, login, etc. Additionally, we gathered a number of negative findings, which would help us improve the UI/UX of our application. The basic negative findings are summarized below:

- Some users couldn't understand some of the information provided in the screen "Explore", and they were confused by the categorization of the projects, such as In Progress, Outdoor, In-house, etc (Figure 14).
- Some users said that the images were too big and they couldn't navigate through the application very easily (Figure 14).





- It wasn't clear to the users that they could click on a step, so as to see the description (Figure 15)

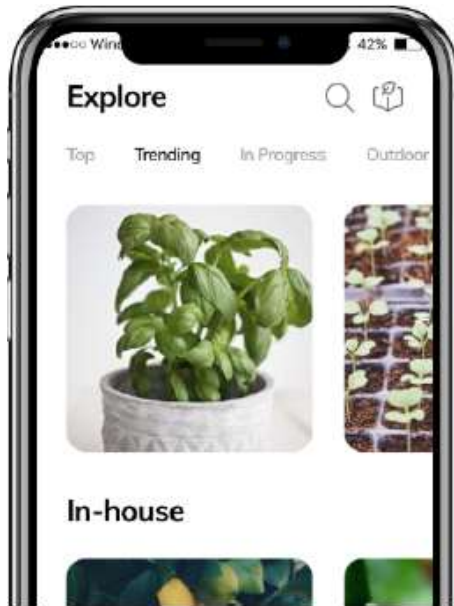


Figure 14, Explore Page

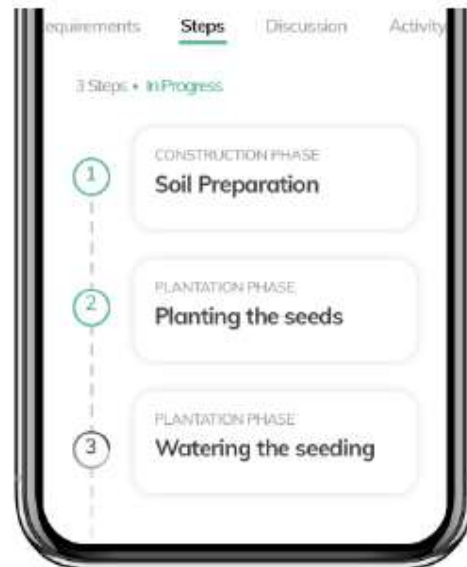


Figure 15, Steps of a project

- Some users could not understand the meaning of the option "Mine" and the content that was presented on this screen. Later on, we also realized that they expected to see different kind of information in that screen (Figure 16).
- In the screen "create a project" we observed that at first, users understood that there are two different screens, the one on top of the other. They also thought that they could close the first screen pressing the button "X" and remain in the other screen (Figure 17).

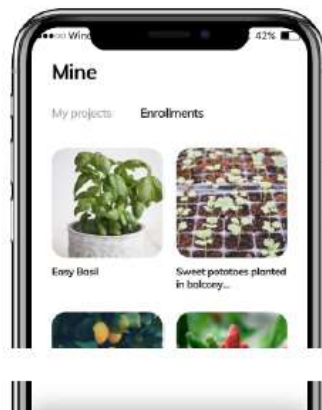


Figure 16, "Mine" screen

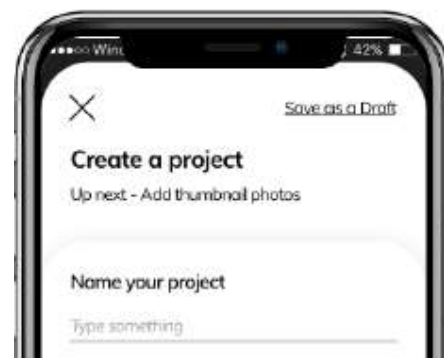


Figure 17, "Create a Project" screen



- Some users reported that the navigation from the screen that presented the list of steps of a project, into each one of the steps was not very clear. Some users reported that they didn't notice the option "Done" in the screen "step" (Figure 18).
- In the screen "create a step" users reported that they were confused and they didn't understand what they had to do (Figure 19).



Figure 18, Screen "step" of a project

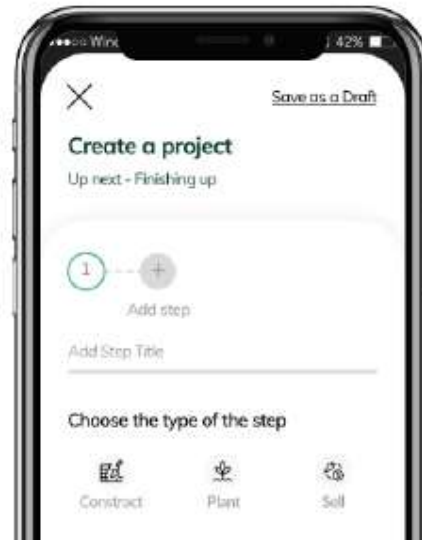


Figure 19, Screen "create a step"

## 5.4 UI Design - Final Prototypes

Based on the feedback we received from the Usability Tests we proceeded to the final step of the UX/UI design. We created the final high-fidelity, pixel-perfect, interactive prototypes, and delivered them to the development team in the way they prefer. Using the [Zeplin](#) tool, we built the Design Systems and Guidelines, bridging the designers-developers distance.

## 6. Phase No4: Gamification

Gamification is a key feature for bringing people into our application, and keeping them engaged with their projects, while helping increase social activity. Specific tasks within the application, such as (in order of most to least important) creating or contributing to a project,



commenting on a project, or receiving likes, either for a project or for a comment, give points to the relevant user. Therefore, more active users will receive more points than less active ones. We have also implemented levels of engagement. Depending on a user's points, they attain each level in sequence. Their level is then displayed in their profile, where they earn the badge corresponding to their level. In this way, we encourage users to engage with the more creative aspects of the application, since creating or contributing to a project provides a user with the maximum amount of points, while also rewarding the more socially inclined users by giving points for commenting on a project. This ensures that users can engage with the app on their own pace, and according to their own interests.

### Gamification System

In order to create a successful gamification system, first we defined the parameters of the rewarding system.

### Rewards - Number of points

#### **- Rules:**

- A. Every action has a particular reward
- B. An action can be assigned to X repetitions of reward
- C. A set of rewards leads to the unlocking of a new level
- D. The difficulty of taking the user to the next level is exponential
- E. The system does not remove rewards

#### **- The following actions are assigned to specific rewards:**

Actions	Points	Repetitions
Like project	+5 points	10
Comment project	+10 points	10
Enroll in project	+50 points	$+\infty$
Complete and share project step	+10 points	$+\infty$



Complete and share project (bonus)	+50 points	$+\infty$
Create project	+500 points	$+\infty$
Stay active for a month	+100 points	1
Stay active for a year	+500 points	1

### User Levels

**“commurban”** has 6 levels that represent the evolution of the user. The user can pass to the next level by collecting points from the actions presented above. The levels are described below as they are presented in the application (Figure 20):

#### 1. Commurber

0 - 149 points

This is the base of the gamification system and it unlocks once a user is registered.

*“You are now a Commurber. Start your journey in urban agriculture and collect points to unlock different levels and awards.”*

*By enrolling to a project you can earn 50 points and by creating your own project you can earn up to 500 points!*

*Keep commurbing!”*

#### 2. Seeder

150 - 499 points

*“Unlock **“Seeder”** by collecting 150-499 points!*

*Every time you like a project you collect 5 points and every time you comment on a project you collect 10 points.*

*By enrolling to a project you can earn 50 points and by creating your own project you can earn up to 500 points!*

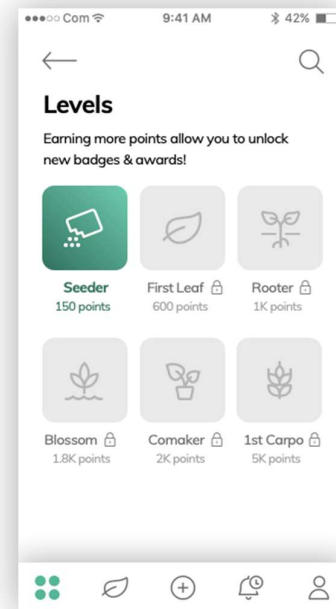


Figure 20, Levels of Gamification



*Keep commurbing!"*

### **3. Leaf**

500 - 999 points

*"Unlock **"Leaf"** by collecting 500-999 points!*

*Every time you like a project you collect 5 points and every time you comment on a project you collect 10 points.*

*By enrolling to a project you can earn 50 points and by creating your own project you can earn up to 500 points!*

*Keep commurbing!"*

### **4. Sprout**

1.000 - 1.999 points

*"Unlock **"Sprout"** by collecting 1.000-1999 points!*

*E Every time you like a project you collect 5 points and every time you comment on a project you collect 10 points.*

*By enrolling to a project you can earn 50 points and by creating your own project you can earn up to 500 points!*

*Keep commurbing!"*

### **5. Blossom**

2.000 - 4.999 points

*"Unlock **"Blossom"** by collecting 2.000-4.999 points!*

*Every time you like a project you collect 5 points and every time you comment on a project you collect 10 points.*

*By enrolling to a project you can earn 50 points and by creating your own project you can earn up to 500 points!*

*Keep commurbing!"*

### **6. Carpo**

5.000 – 9.999 points

*"Unlock **"Carpo"** by collecting 5.000-9.999 points!*



*Every time you like a project you collect 5 points and every time you comment on a project you collect 10 points.*

*By enrolling to a project you can earn 50 points and by creating your own project you can earn up to 500 points!*

*Keep commurbing!"*

## 7. Phase No5: Development

During the designing phase of the UX/UI team kept the developers' team updated and discussed with them any issues that needed to be clarified. Once the final high-fidelity, pixel-perfect, interactive prototypes, were delivered the development of the **"commurban"** started. The first version of **"commurban"** was launched in June 2019. The table below presents the releases of the application.

Version	Status	Release Date	Description
1.5.0	Unreleased	30/Nov/2019	<ul style="list-style-type: none"> <li>&gt; Bug fixing of version 1.4.0</li> <li>&gt; Finalize the Community Projects feature</li> <li>&gt; Login using Chinese social media</li> <li>&gt; Mobile support for Multilanguage</li> </ul>
1.4.0	Unreleased	30/Sep/19	<ul style="list-style-type: none"> <li>&gt; Bug fixing of version 1.3.0</li> <li>&gt; Community Projects</li> <li>&gt; API Support for Multilanguage</li> <li>&gt; Fix Project Location issue</li> </ul>
1.3.0	Released	03/Sep/19	<ul style="list-style-type: none"> <li>&gt; Bug fixing of version 1.2.0</li> <li>&gt; User Notifications</li> </ul>
1.2.0	Released	01/Aug/19	<ul style="list-style-type: none"> <li>&gt; Bug fixing of version 1.1.1</li> <li>&gt; Gamification</li> </ul>



			> Project Activity > Youtube videos
1.1.1	Released	17/Jul/19	> Hotfix Facebook login
1.1.0	Released	12/Jul/19	> Bug fixing of version 1.0 > Facebook Login, > On boarding after signup > Discussions
1.0.1	Released	14/Jun/19	First Mobile Version
0.3.0	Released	29/May/19	Final Version of API and Mobile views (Internal)
0.2.0	Released	15/May/19	Internal Version of API
0.1.1	Released	07/Mar/19	Internal Version of API

## 8. Opportunity Backlog

In the framework of our research and our interaction with the stakeholders and the users, we identified a number of opportunities and ideas that could be explored in the future. We present them below as the beginning of an opportunity backlog for the project, with ideas for future extensions. Some of them were designed in their original form, but not in detail, as they are not included in “*commurbans*” initial user requirements. Even though “*commurban*” was initiated for the engagement of the users, based on our research, it seems that it could be evolved into a commercial product that could be exploited and create revenues.

### 1. Plant wiki - show details of plant species

We could stimulate the information we provide to the users concerning the types of plants and their specific characteristics. For example, inside a project, in the part where the plant species are mentioned, we could add a link, or an attractive visual element that users could



click on, and this would redirect them to a page with additional information about this specific plant (Figure 21).

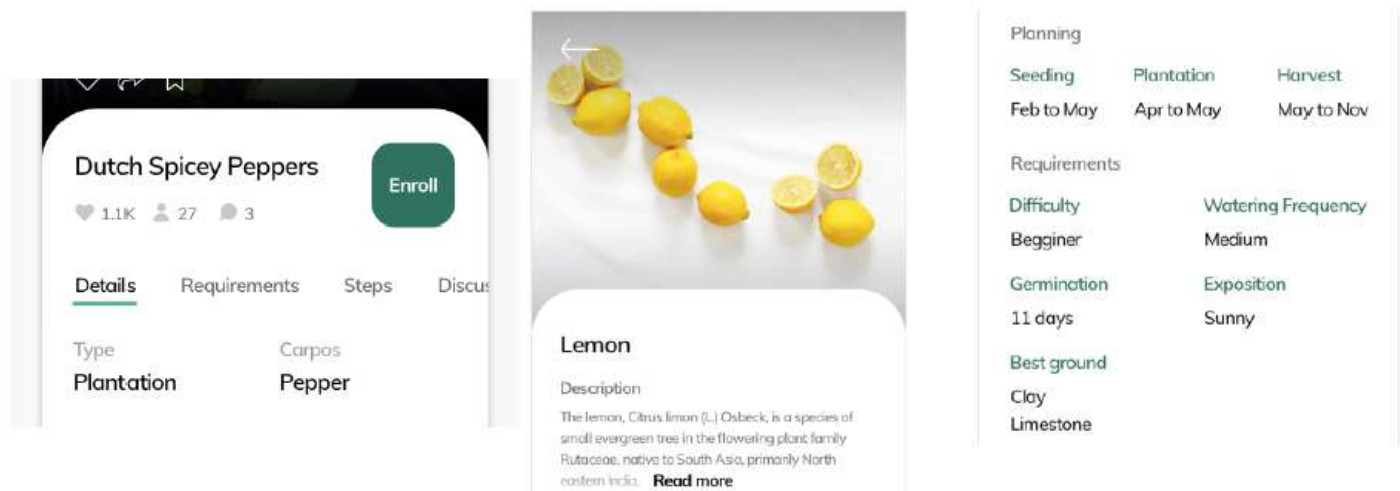


Figure 21, Plant wiki

Users could also have a relevant option on the “Explore” screen, which would redirect them to a screen listing the various species of plants, in order to choose the ideal one. An additional functionality could be added in this screen, so that users could have the option to see projects related to this plant (Figure 22).



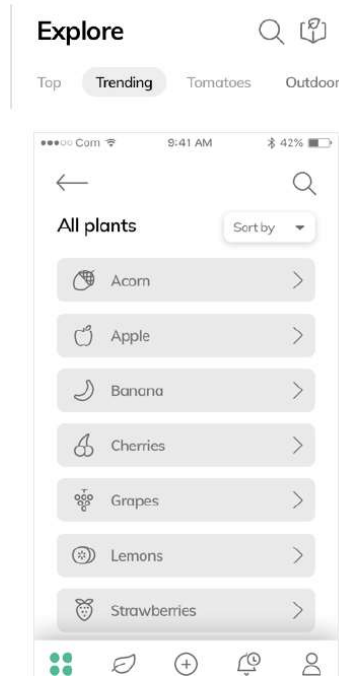


Figure 22, Plant-Wiki - Explore projects

## 2. World Leaderboards

Based on our research we selected a gamification system which presents each user's points as public information and not as an overall ranking system. As a next step, we could add percentages that present the evolution of each user in relation to the other users in country, or even global level (Figure 23).

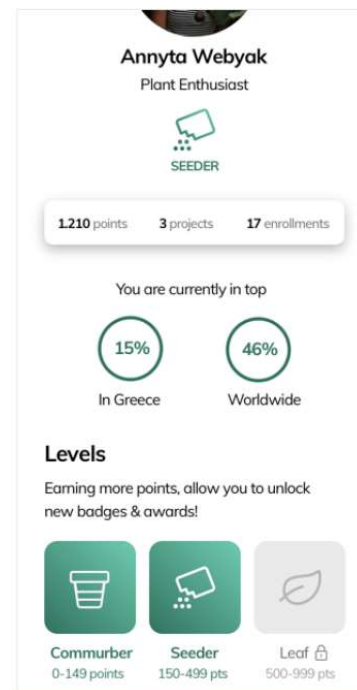


Figure 23, World Leaderboards



### 3. Offline Usage

Using an application like “*commurban*” is very likely to happen in conditions where there is no good internet connection, or at a time that users do not want to download multimedia content using links. A future idea is the provision of options such as make information “Available Offline”, or “Download Information”, and large files, such as videos, or whole projects (Figure 24).

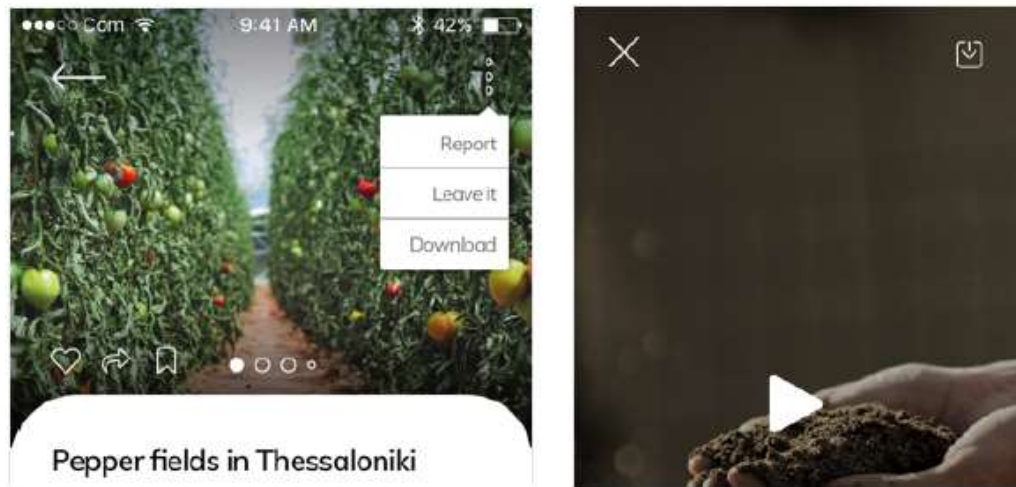


Figure 24, Offline Usage

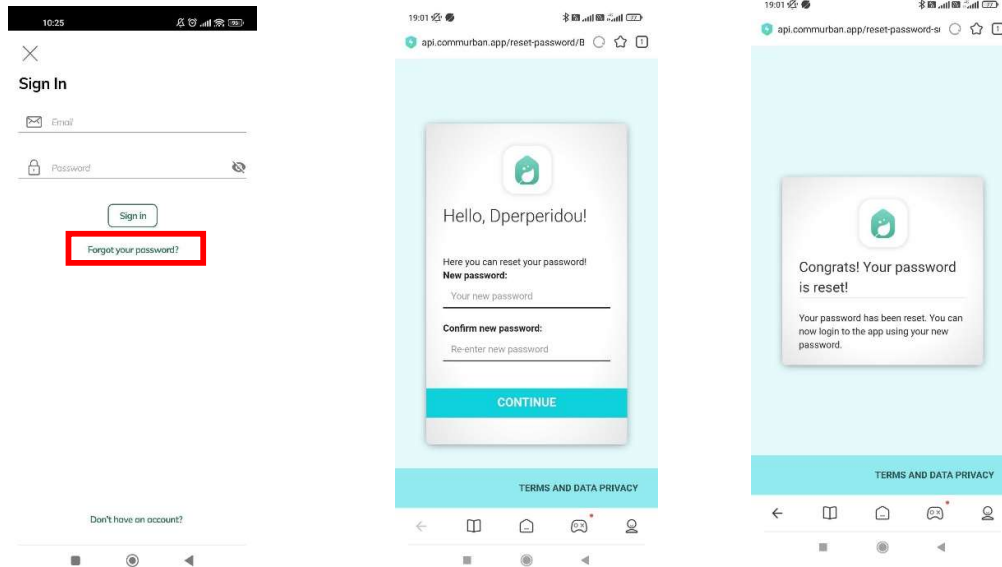
### 4. Other ideas for future research and design

- When users create steps in their projects give them the option to upload material directly through lists in their mobile devices.
- Create a functionality that will present all the raw materials of a project and information related to their selling points.
- Create a marketplace, where companies and other legal entities could demonstrate their products through DIY project and have the opportunity to sell them directly to the users.

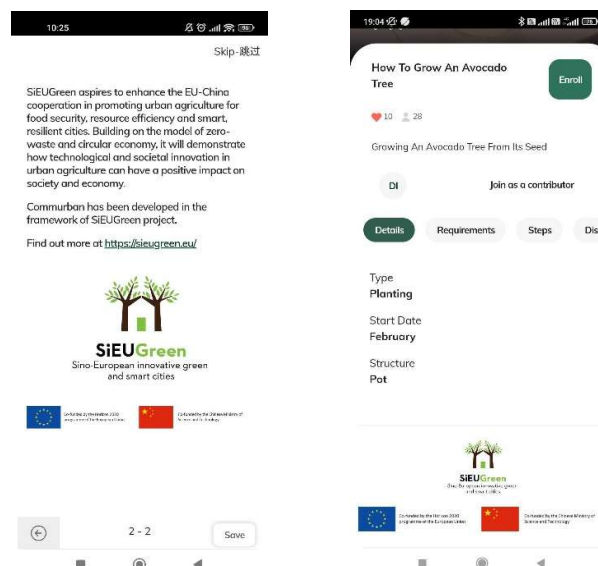


## 9. Additional functionalities and features

1. **Forget Password:** The “Forget Password” functionality was added in the COMMURBAN application to allow users retrieve access to their account in case they forget their password.



2. **EC Disclaimer:** The EU Disclaimer is available when downloading the application (left), as a footer in all the Projects of commurban app (right).



3. **User rights:** Users will be able to access their rights from the bottom right menu in the **next update** of commurban that is foreseen early in 2023. The last update was in 2022





## 10. Hosting and data protection

1. **App hosting:** Mobile applications need to be stored somewhere, so when there is an interaction of the user with their mobile device, a request can be send to return the necessary information. For example, when a user chooses to add a new Project in commurban, a request is send for the respective form to be returned and visualized in the device.

commurban application is hosted in a third-party host provider in a dedicated server. That choice was made for a number of reasons including but not limited to: i) the fact that third party providers are experts that specialize in building, configuring and maintaining the servers; ii) it is more affordable that buying and maintaining in house servers; and iii) are easier to scale if needed.

commurban is stored in one of the largest data center operators in Europe. All data centers of the provider are ISO 27001 certified and meet international safety standards. There is 24/7 support by trained technicians via telephone or email. Furthermore, the provider ensures that the data remain safe and private and that can always be accessed from the IT systems.

The distribution of the app is done by the AppStore, GooglePlay and an apk provided in the SiEUGreen Website. Through the first two channels mentioned, further safety is ensured for the users, since for releasing an app in the stores there is a process (i.e. alpha testing, beta testing, etc) requiring a number of steps (i.e. Terms of Service, Privacy, etc) to ensure that users are protected.

2. **Protection of information:** As indicated above commurban has a dedicated server provided by a third party. The ISO 27001 certificate is an internationally recognized standard for information security and certifies that an appropriate information security system (ISMS) is in place. The certificate confirms that the provider will uphold strict information security standards using its ISMS, including protecting the security, confidentiality, and integrity of its customers' data. Moreover, it will provide safeguards, so only authenticated users will have access to their IT systems.
3. **Data retention:** Since commurban app will be available after the lifetime of the project, data will be maintained for as long as it is available in the stores and policy will also be updated accordingly.



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## 11. Annex 1: Personas



**Lucy Wu**  
BUSINESS

Age: 37 years old  
Profession: Store owner  
Education: BSc, Electric Engineering

**SOCIAL** **ANXIOUS**

Microsoft Edge  
High performance

34% 22% 0%

### ABOUT

Lucy has been the owner of a bio grocery store for some years now. Traffic has significantly been reduced in her store and she is looking for ways to attract people. She has begun selling products that she cultivates herself, but so far only few customers know this. She is searching for a medium to promote her project and stress that the products in her store are organic and without preservatives.

### NEEDS

- She wants to show that her products are organic and that her store is "different"
- She wants to make her store known
- She wants to attract people that look for bio products
- She wants to get her store popular through social media

### FRUSTRATIONS

- When things don't go as planned
- If she doesn't manage to attract people in her store
- When she can't understand how an app works (ex. it doesn't have indications)

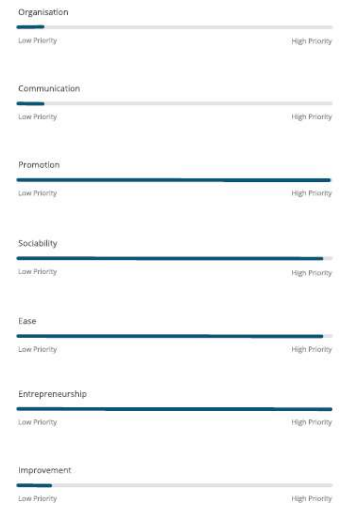

### MOTIVATIONS

- Promote her store through cultivation projects
- Have an instant proof of her work
- Become part of a community
- Let the world see what she is doing
- Get awards for her products

### GOALS

- Upload photos of her products
- Showcase the process of planting
- Showcase the results of cultivating without preservatives
- Customers telling her they found her through social media

### BEHAVIOURAL FACTORS

**Pericles Theofanous**  
COMMUNITY

Age: 42 years old  
Profession: Teacher  
Education: MSc, Mathematics

**CALM** **ORGANISING**

Google Chrome  
High performance

38% 47% 13%

### ABOUT

Pericles is a high school teacher. He is also the manager of the apartment building where he resides. In recent times he has been organizing an effort by his neighborhood community to create a pocket park in an unused space besides his building. After the project was approved, his effort has become more intense, leading him to search for people that have the expertise besides the wish for work.

He is looking for the appropriate platform to attract more people to participate in this effort.

### NEEDS

- He wants to find people who have her appropriate expertise
- He wants to give inspiration to other neighborhoods
- He wants to find co-workers

### FRUSTRATIONS

- When he can not organize his team
- When he does not have contact with the people participating in the project
- Having problems with the approval of the project

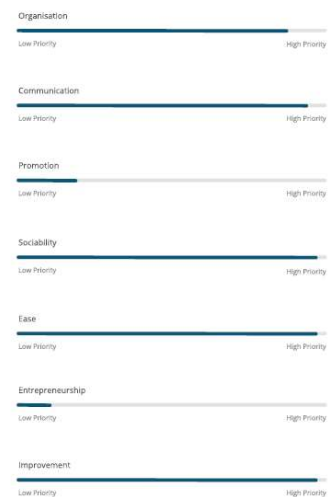
### MOTIVATIONS

- A means of organization and communication with the people involved in the project
- Simplicity on the platform
- Inspiration from a similar project
- Support and advice from people with expertise

### GOALS

- Organize the project at concrete steps
- Monitor other projects
- Present his work

### BEHAVIOURAL FACTORS






**Tanya Spiro**  
PUBLIC SECTOR

Age: 52 years old  
Profession: Supervisor  
Education: BSc, Agriculture

TYPICAL SCHOLASTIC

Microsoft Edge (high performance)

70% 12% 3%

### ABOUT

Tanya is the supervisor of a municipal authority that aids efforts in urban agriculture. Her main concern is to inform citizens and provide expertise to groups that deal with urban agriculture issues. Also, she has the appropriate knowledge to provide consulting in cases where funding of large-scale community projects is in need.

### NEEDS

- She wants to provide know-how and information
- She wants to promote projects she has get financing
- She wants to follow similar projects
- To raise awareness

### FRUSTRATIONS

- The lack of know-how in such kind of projects
- Bad communication with teams
- No platform which she can use to promote urban agriculture

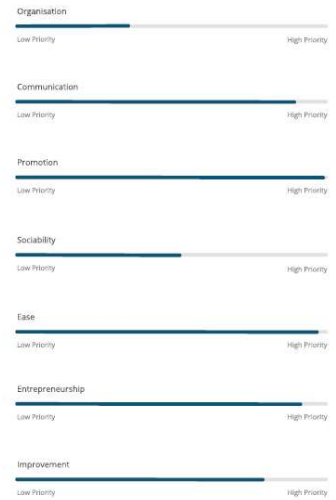
### MOTIVATIONS

- Ability to contribute to a project
- Presentation and promotion of a project
- Advice and response to questions
- Presentation of her previous projects (portfolio)
- Easy interaction with communities

### GOALS

- Promote awareness
- Contact with groups
- Organize teams

### BEHAVIOURAL FACTORS




**Nia Soto**  
ACTIVIST

Age: 27 years old  
Profession: Marine Biologist  
Education: BSc, Biology

PASSIONATE RESOURCEFUL

Google Chrome (high performance)

0% 52% 23%

### ABOUT

Nia is a hydrobiologist. She wants to organise projects that have a positive influence on a larger community. So far she has been involved with many projects, but without the proper tools needed to raise awareness. She avoids posting on popular social media.

She wants to contribute to a larger movement to improve urban life.

### NEEDS

- She wants the right tools to raise awareness
- She wants to meet people who have the same goals and want to help
- Does not want to use Instagram directly, Facebook, etc.
- She wants instructions on how to promote a project and make it draw attention

### FRUSTRATIONS

- She has some project but does not know how to present them
- She's alone in most projects
- She does not always know all the laws which may affect the project

### MOTIVATIONS

- Create a team that will participate in the project
- Find similar projects and observe their evolution
- Show proof of the impact it has on the world

### GOALS

- Make or get into a community
- Look for similar projects
- Post her work
- Get better awareness of the environment in which she wants to develop the project

### BEHAVIOURAL FACTORS








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## William Gatwa

EDUCATION


Age  
39 years old

Profession  
Teacher

Education  
BSc, Secondary Education

CARING

ORGANISING



Microsoft Edge  
High performance

88% 52% 13%

### ABOUT

William is a middle school teacher. Due to an environmental program he has undertaken, he started organizing the cultivation of a vegetable garden within the school. With the help of the parents' association, the appropriate tools and materials have been gathered to prepare the project. However, there is a lack of expertise. William needs to find a platform to learn how to proceed with the project and also present the final results of the students' effort.

At the time, the school's blog is used to present and record the project.

### NEEDS

- He wants to organize the project
- He wants to properly do the preparation of the vegetable garden
- He wants to get ideas
- He wants to present his students' work

### FRUSTRATIONS

- Not be able to organise properly the project
- If he does not have feedback on the project
- If he does not manage to mobilize his students

### MOTIVATIONS


- Organize the steps of the process through the platform
- Present the project to parents
- Find similar projects
- Simplicity in the use of the platform
- Ability to track the evolution of the progress (calendar, progress line)

### GOALS

- Publish the project
- Find similar projects
- Find tips and tricks (the right know-how)
- Mobilize other schools and programs

### BEHAVIOURAL FACTORS





## Natasha Milyern

HEALTH CONSCIOUS


Age  
38 years old

Profession  
Yoga Instructor

Education  
MSc, Personal Trainer

CALM

PATIENT



Google Chrome

99% 34% 84%

### ABOUT

Natasha has been working as a yoga instructor. Although she is involved in gymnastics, her diet is not optimal, according to herself, and she has decided to start cultivating her own vegetables and fruits. She is aware of the importance of urban agriculture to avoid chemical substances.

Her goal is to follow a primarily healthy diet, knowing what she consumes. She has started searching online (Pinterest) and collecting information but she is not so sure it is the right time to begin this journey.

### NEEDS

- She wants to make a change in her nutritional habits
- She wants to know what she consumes
- Does not want to spend too much time
- She wants to exchange ideas and to have contact with people

### FRUSTRATIONS

- When she is distracted from her goals
- When she doesn't see progress
- When she deals with too many tasks

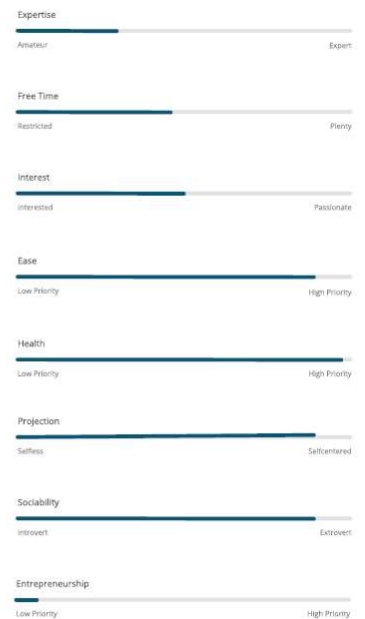
### MOTIVATIONS

- A similar project to guide her
- The community keeping her focused to her goal
- Interaction with the platform during the progress of the project (maybe also reminders)
- Tips for a new project
- Articles for good nutrition

### GOALS

- To improve her diet
- Find directions for what she has in mind
- To enter a community with the same aspirations
- See if she has the requirements for the project she wants to start

### BEHAVIOURAL FACTORS








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## Chaneil Kular

**HOBBYIST**

Age: 32 years old  
Profession: -  
Education: BsC, Interior Designer

**CREATIVE** **EASILY DISTRACTED**

Google Chrome (high performance)

34% 32% 70%

### ABOUT

Chaneil works from home as a graphic designer. At the time, he is searching for new interests, preferably not something that requires many hours in front of a computer. He is trying to find a creative hobby that will also bring him practical benefits. Urban farming is something that has drawn his attention, but he has some doubts due to lack of experience.

All that he needs is a push to start. More specifically, to view ideas on urban agriculture and visualize the opportunities.

### NEEDS

- He wants to give his energy on a new hobby
- He wants his time to be spent creatively
- Seeks something easy
- Seeks ideas for inspiration

### FRUSTRATIONS

- When he feel that he can not do something
- When he is distracted
- Expensive tools and building materials
- Multiple page instructions

### MOTIVATIONS

- Presentation of a project in simple steps
- Aesthetically pleasing photos
- A simple and quick project to start with
- Mention of the time needed for a certain project

### GOALS

- To start crafting
- Get away from the computer
- Get some ideas
- See how difficult or time consuming it is
- Show the results to his family and friends

### BEHAVIOURAL FACTORS




## Ian Hunter

**OPPORTUNITY SEEKER**  
(BUSINESS WISE)

Age: 32 years old  
Profession: Project Manager  
Education: MsC, Economics

**HYPED** **ENTREPRENEUR**

Microsoft Edge (high performance)

7% 82% 83%

### ABOUT

Ian is the project manager of a startup providing smart city solutions. He is searching for possible partnerships while expanding the company's network. He wants to have a strong presence in social media and to promote the projects of the company. At the same time, he wants to watch potential competition and generally find ideas that could be useful to him.

He has no knowledge of urban agriculture but is interested in contributing to the city community through his company.

### NEEDS

- He wants to expand his network
- He wants to promote his company
- He wants to make partnerships

### FRUSTRATIONS

- When he has to post in all social media platforms
- When he does not have feedback on his projects

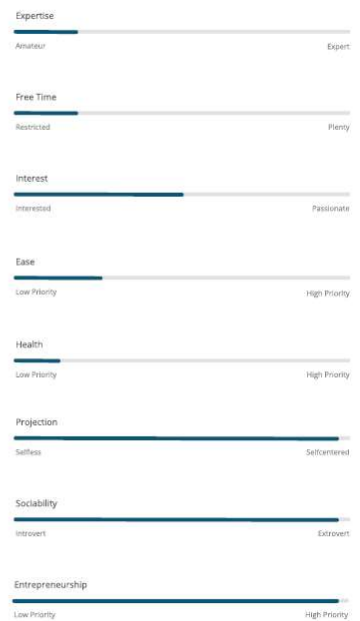
### MOTIVATIONS

- Targeted audience
- Tracking competition
- Communicating with potential partners
- Presentation of his previous projects (portfolio)
- Simplified publishing process

### GOALS

- Increase audience in social media
- Track competitors
- Promote new projects

### BEHAVIOURAL FACTORS





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# Yanna Svetjki

**SOCIALISER**

Age: 27 years old

Profession: -

Education: BsC, Agriculture

**TREND SEEKER** **INTROVERT**



Mozilla Firefox



64%



82%



80%

## ABOUT

Yanna is particularly creative and has done lots of personal DIY projects. She has knowledge on agriculture as this was the subject of her studies. She is an introvert and prefers to spend time in her projects than going out. Nonetheless, she is very much involved in social media, uploading photos for food and decoration. She mainly uses pinterest to find inspiration.

She needs a platform to meet people with similar interests and to get into such a community. What will persuade her to do so is collecting likes and shares in her projects.

## NEEDS

- She wants to show her projects to people
- To draw inspiration from beautiful aesthetics
- To have likes and appreciation
- To start something on her own
- To feel that what she does is unique

## FRUSTRATION

- When she has to speak with someone face to face
- If her projects are not aesthetically pleasing
- If she does not succeed in something
- Not being organised

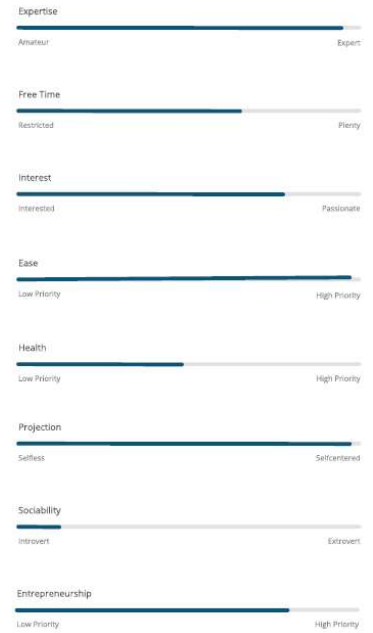
## MOTIVATIONS

- A similar project but not the same as hers
- The beautiful aesthetics of the platform
- Already existing projects (she would never post first in a new platform)
- An active community with a common goal

## GOALS

- Browse the application
- Binge watch for ideas
- To start something of her own if she decides it is quite special
- Read for information
- To meet people like her
- Not give too much time

## BEHAVIOURAL FACTORS





## 12. Annex 2: User Tasks

### 1. A non-registered user wants to navigate through the app

- A. Opens app
- B. Navigates to Home

#### C. Scrolls through projects

---

- A. Opens app
- B. Navigates to Home
- C. Clicks search element
- D. Types keywords and enter

#### E. Scrolls through results (projects)

---

- A. Opens app
- B. Navigates to Home
- C. Chooses between tags

#### D. Scrolls through projects

### 2. A non-registered user wants to interact (like, save, enroll, ask to join) with a project

*Note: A non-registered user cannot like, save, enroll, ask to join*

- A. Opens app
- B. Navigates to Feed (or anywhere with a list of projects)
- C. Stops over the preview of a project
- D. Clicks action icon (like, save)

#### E. Modal opens ups (Sign up, or Sign in)

---

- A. Opens app
- B. Navigates to Feed (or anywhere with a list of projects)
- C. Clicks on preview



D. Navigates inside project

E. Clicks action icon (like, save, enroll, ask to join)

**F. Modal opens ups (Sign up or Sign in)**

### **3. An non registered user wants to register to the app**

A. Opens app

B. First time - Screen to register opens up

C. Types credentials

D. Clicks on signup/register button

E. (A modal that refers to the status of the registration opens up)

**F. Clicks ok**

---

A. Opens app

B. First time - Screen to register opens up

C. Registers through social media

D. Clicks on signup/register button

E. A modal that refers to the status of the registration opens up

**F. Clicks ok**

---

A. Opens app

B. ...Use app...

C. Modal opens up (Sign up sign in)

D. Clicks on Sign up

E. Follows above-mentioned methods

### **4. A registered user wants to interact with a project**

#### **4.1 Like**

A. Opens app



- B. Navigates to Feed (or anywhere with a list of projects)
- C. Stops over the preview of a project
- D. Clicks action icon (like)

#### **E. Icon fills with color**

---

- A. Opens app
- B. Navigates to Feed (or anywhere with a list of projects)
- C. Clicks on preview
- D. Navigates inside project
- E. Clicks action icon (like)

#### **F. Icon fills with color**

### **4.2 Save**

- A. Opens app
- B. Navigates to Feed (or anywhere with a list of projects)
- C. Stops over the preview of a project
- D. Clicks action icon (save)

#### **E. Toast opens up and highlights saved projects with specific message**

---

- A. Opens app
- B. Navigates to Feed (or anywhere with a list of projects)
- C. Clicks on preview
- D. Navigates inside project
- E. Clicks action icon (save)

#### **F. Toast opens up and highlights saved projects with specific message**

### **4.3 Comment**

- A. Opens app



B. Navigates to Feed (or anywhere with a list of projects)

C. Clicks on preview

D. Navigates inside project

E. Clicks action icon (discussion)

F. Types comment

**G. Submits comment**

#### **4.4. Enroll**

A. Opens app

B. Navigates to Feed (or anywhere with a list of projects)

C. Clicks on preview

D. Navigates inside project

E. Clicks action icon (enroll)

F. Modal opens up (Enroll status)

G. Clicks ok

**H. Icon changes to progress circle**

#### **4.5 Ask to join (contribute to a community project)**

A. Opens app

B. Navigates to Feed (or anywhere with a list of projects)

C. Clicks on preview

D. Navigates inside project

E. (If action icon (ask to join) exists)

F. Clicks action icon (ask to join)

G. Modal opens up (Ask to join status)

H. ...Waits author to approve....



**I. Notification shows they have been accepted to contribute**

**5. A registered user wants to create a community project**

- A. Opens app
- B. Navigates to Feed (or any other screen that shows the bottom navigation bar)
- C. Clicks on New Project (Plus)
- D. Chooses between “Create new project” or “Create community project”
- E. Guide opens up
- F. Follows the guide
- G. Have it as Draft or Publish

**H. After saving it as draft or publishing it, user is navigated to My projects**

**6. An author wants to edit their project**

- A. Opens app
- B. Navigates to My projects
- C. Clicks on preview
- D. ... To edit the project ....
- E. Clicks on action icon (edit)
- F. Editing guide opens up
- G. ... Edits project ...
- H. Clicks Save

**I. After saving it the user is navigated to project view**

**7. An author wants to view the status of their project**

- A. Opens app
- B. Navigates to My projects



C. Clicks on preview

D. Navigates inside project

**E. Views likes, enrolls and comments**

**8. An author wants to delete their project**

A. Opens app

B. Navigates to My Projects

C. Clicks on preview

D. Navigates inside project

E. Clicks on action icon (Three bullets)

F. Chooses delete project

G. A modal opens up (Are you sure?)

H. Clicks ok

**9. An enrolled user wants to complete step or project**

A. Opens app

B. Navigates to Enrollments

C. Clicks on preview

D. Navigates inside project

E. Clicks on steps

F. Screen with steps opens up

G. Checks step as done

H. Will earn points for completing steps or whole project

**10. An enrolled user wants to leave the project**

A. Opens app





- B. Navigates to Enrollments
- C. Clicks on preview
- D. Navigates inside project
- E. Clicks on action icon (Three bullets)
- F. Chooses Un-enroll
- G. A modal opens up (Are you sure?)
- H. Clicks ok**

#### **11. A contributor wants to leave project**

- A. Opens app
- B. Navigates to My projects
- C. Clicks on preview
- D. Navigates inside project
- E. Clicks on action icon (Three bullets)
- F. Chooses “Leave project”
- G. A modal opens up (Are you sure?)
- H. Clicks ok**

#### **12. A registered user wants to view their profile**

- A. Opens app
- B. Navigates to Profile (or click avatar through any other screen it appears)
- C. Views details

#### **13. A registered user wants to view a user’s profile**

- A. Opens app
- B. Navigates through app...



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C. Clicks on user name

**D. Views details**

**14. A registered user wants to view levels of gamification**

A. Opens app

B. Navigates to Profile

C. Clicks on their level (Learn more)

**D. Screen with all level information appears**

**15. A registered user wants to view their settings**

A. Opens app

B. Navigates to Profile

C. Clicks on Settings

**D. Views details**



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