Social Togetherness Through Sharing Gardening Tools Phase 3

Team VC

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ABSTRACT

In modern society, an increasing number of young and old people feel disconnected with one another. This creates a lack of social connection for the old people and similarly, this limits the young people to inherit knowledge from the old people. To address this problem, we use social gardening as a tool to build a community through which young and old can get connected and share knowledge among them. For this, we perform a user study to evaluate our idea and developed four experience goals: togetherness, generosity, lessening loneliness, and sharing knowledge. As a realization, we developed a mobile application for social gardening and evaluated the application against the defined experience goals. We followed Hassenzahl's model of pragmatic and hedonic quality to understand users interaction with the prototype. Our evaluation shows that the developed application fulfills the stated experience goals.

KEYWORDS

Social Sharing, Gardening Tools, Old People, Young People, Fighting Loneliness, Togetherness, UX-User Experience, EDD-Experience-driven design.

1. INTRODUCTION

Increasing number of old people in proportion to low birth rate especially in western countries is an emerging challenge to overall social stability (Nargund, 2009). Causes like secluded lifestyle, nuclear family, ego, and imbalanced self-dependency are throttling up the population of unhappy, lonely old people (Singh and Misra, 2009). On the other hand, younger people who are not connected to the elder people, in most of the cases, are not aware of their lonely senior citizens.

The topic our team has chosen is ‘Social Sharing’. Considering the above-described challenges, we have come up with a plan where we want to establish a bridge between those two age group, old and young to fight the loneliness of aged people. To build a community and to make our plan working, we develop a mobile application to connect the people. Features like, searching and borrowing the gardening tools, getting news of events, donating for community are available in that application. Primarily, our target groups are both the old and young people who are interested in gardening and secondarily the young people who want to give back something to their society by maintaining the application, arranging the meetings, and executing the decisions taken by the community’s steering body.

For work, first we reviewed three papers related to elder care experience, building up social capital and food sharing as background study. Secondly, we explained Experience-driven design and the UX model. Thirdly, we describe the experience goals for our application which will be reflected in the prototype. Fourthly, we perform context study to understand users expectation regarding our application. We developed application based on the defined experience goals and collected feedback from the user study. We perform another user study using the application to validate that the developed application meets user experience goals. Additionally, we perform evaluation based on Hassenzahl model (Hassenzahl, 2010). We concluded our report by describing the limitation of works, the weakness and future prospect of the application.

2. RELATED WORK

2.1 Related scientific works

The ELDer (Enhanced Living through Design Research) is a project with a purpose to understand the experiences of elders and their caregivers in order to follow these three ideas : 1) study the eldercare experience from the perspective of primary stakeholders; 2) to assess the importance of psychological and social factors in the eldercare experience; and 3) to identify implications for product, interface, and interaction design and opportunities for new products and technologies. Their findings show that social, emotional, and environmental factors play a key role in the eldercare experience and the adoption and use of new products, which is related to our project idea. From this project, though we cannot find out the relation or sharing knowledge between elderly and young people we can identify the barriers for eldercare experience as in our project we also have to find out if there is any barrier while sharing the gardening tools. Again, as it's a new product, so we have to identify whether elderly people will be able to adopt the use of the product (Hirsch et al., 2000).

Katherine Alaimo et al (2000) describes the way to build social capital in a neighborhood or a locality through participating in community gardening or beautification. Social capital represents the network of relationships between neighbors in a locality. They tried to examine how participation in the gardening activity can increase bonding between members of a community. They focused on how community activity can lessen crime rate, increase healthy habits and improve socializing among the members of a neighborhood. This paper focused on finding ways to develop networks, norms, and trust in low resource neighborhood through participation in community works like gardening. In Our project, we are also trying to develop social capitals through sharing gardening tools like this research has tried to develop (Alaimo et al., 2000).

Eva Ganglbauer et al (2014) worked on a project where they studied the matter instead of wasting how a community can share their extra food to others for free using the internet. People of that community is organized through the website Foodsharing.de and also that website's Facebook group. In that group, people from different backgrounds discuss food sharing and let others know to collect if they have any extra food. This paper focused on how some factors like individual, community, organizational level, media, public relation, discussion etc. can perform together in a Facebook group to make that sharing happen. From the knowledge of food sharing from this paper, we can adopt the idea how gardening tools sharing can be done in our project (Ganglbauer et al., 2014).

2.2 Experience-driven design

EDD (Experience-Driven Design) is a design theory given by Professor Marc Hassenzahl in 2010 which is a way to design experience. This theory has been practiced through interaction with an object to create an experience through that object. EDD comes up with three key questions why, what and how (Hassenzahl, 2010). To explain EDD, Hassenzahl brought an example of an 'improved bucket' from the diploma design project of his student Swantje Krauß (Hassenzahl, 2013). That bucket had an interesting feature which is it can be turned into a chair which allows it's target people the vintagers to take some rest when working. So, that bucket had at least three small details which are :

1. Embedding both activities - keeping grapes and taking rest. As this embedding suggests what the vintagers can do with this chair, so this details of that chair meets one of the questions of EDD 'What'.
2. The bucket has to be empty to take rest. So, to answer the question of how to take rest, the bucket signals that yes, take rest but after the work. So, this acting outcome originates from the sensory-motor level. This is how it answers another question of EDD 'Why'.
3. A particular way of taking rest - enjoying views or having chat with colleagues. By suggesting such a way of taking rest, the last question of EDD 'How' meets the answer. Lastly, instead of too practical or too open-ended products, Hassenzahl prefers creating meaningful experiences with the right technology which cares users (Hassenzahl, 2013).

Experience -driven design related work:

In a case study (Olsson et al., 2013) on designing playful experience (PLEX) students worked considering various conditions and possibilities within the broad range of moving and navigating in winter. After using EDD approach in their project they find out that to design a target experience in designing product and service concepts can help (1) guiding and framing the scope of design which is necessary in our project as well (2) inspiring and adding considerations in the idea creation, (3) evaluating the design outcomes against the set targets which we will apply in our project too and (4) communicating the concept to both internal and external stakeholders. They find the EDD approach as an effective approach in producing innovative designs that well explained the PLEX targets.

2.3 UX Model

User experience has a broader spectrum of definition. But, shortly it can be defined using the ISO 9241-210 standard (DIS, 2009) as "a person's perceptions and responses that result from the use or anticipated use of a product, system or service". User experience can be regarded as a consequence of brand image, presentation, functionality, system performance, interactive behavior, skills, attitude, personality and the context of use. From a user's point of view, it also includes users emotion, beliefs, perception, physical and psychological responses etc.

To validate whether a designed system is providing the intended user experience, we need a user experience model. We have decided to use Hassenzahl's model to design and verify whether the developed system is being able to provide the intended user experiences. This model is discussed keeping in mind two different perspectives which are designers perspective and users perspective. While developing a product, a designer keeps in mind a certain type of features for that product and then approaches building a certain type of character for that product with the help of those features. Product characters developed by the designer is intended to provide a certain type of attributes to the user. Those characters are consisting of two groups of attributes which are pragmatic and hedonic attributes. Pragmatic attributes refer to the manipulation of a certain environment while providing relevant functionality like usability, utility, usefulness, controllability etc. It focuses on the fulfillment of a user's behavioral goal. Hedonic attributes focus on the psychological wellbeing of the user. Typical hedonic attributes of a product can be "outstanding", "impressive", "exciting" and "interesting". The hedonic function of products can be further subdivided into providing stimulation, communicating identity, and provoking valued memories. Also, the apparent characteristics can be perceived differently from the intended ones by the users. This the apparent characteristics of the product leads to consequences where users can measure the appeal of the product, pleasure and satisfaction level gained while interacting with that product (Hassenzahl, 2018).

3. DESIGN EXPLAINED

The system that we are designing, is going to be used by both young and old people. The design pattern will be such that it will be easier to use for the older people. The design will be implemented on mobile devices so that older people can access the application easily.

The application will contain a searching feature from where users will be able to see the available gardening tools that can be borrowed. The available gardening tools will have information of the owner and the location. The users will be able to see and join events created by application moderators. There will be a part in the application where users will be able to donate money for community activities.

We are going to design the application in such a way so that through the features of the application, the user experience goals are achieved.

3.1 Experience Goals

We are working to develop a social sharing platform to share gardening tools between young and old people to engage them in some kind of social interaction. The User experience goals fixed for our research are the following - togetherness, generosity, sharing knowledge, and lessening loneliness.

Togetherness - Both of our target user group-the young and old people will have a feeling of being close to another person by using this platform or service. They will be able to feel a strong feeling of togetherness as they pass more and more time with the gardening tool sharing community, which in terms will create a strong bond among them.

Generosity - Sharing anything gives us a feeling of being kind and generous. As the gardening loving people will share their gardening tools with others, they will experience the state o being generous. Also, the young people will have a sense of being kind towards the elder generation by passing time with them through gardening.

Sharing knowledge - The elder generation usually possesses a great amount of knowledge of gardening. Also, still there are younger people who love gardening and know the value of developing an eco-friendly lifestyle. The elder people will be able to share not only their gardening knowledge but also other life lessons. It will make them feel a great accomplishment that they are passing their lifelong lessons to the younger generations.

Lessening loneliness - Elder people living by themselves have always a feeling of loneliness. This project has a focus to bring younger people in contact with the elder generation. This in terms will be helpful to lessen the loneliness of elder people.

Through participating in gardening-related events in the application, users will be able to feel togetherness. By sharing gardening tools and donating money, users will experience generosity. Through all of this activities, elder people will come in contact with younger people and share their knowledge, which in terms will lessen their loneliness.

3.2 Prototype

We decided to design our product based on a mobile application. Prototyping was done in several phases throughout the project. After ideating together we started to make sketches of a very low fidelity prototype. Low fidelity prototypes were done to paper with pencil. Low fidelity paper prototypes were easy way to start and we were able to alter the design rapidly when it was necessary. Low fidelity prototypes were tested by team members and also by friends and family.

Later on after reaching certain point where we were happy with our low fidelity prototype, we decided to create a high fidelity prototype. High fidelity prototype was based on our final low fidelity prototype results. High fidelity prototype was created with Adobe XD on Mac OS and iterated little further based on our testing. The goal was to create as good and realistic representation of the user interface of the application as possible. Our high fidelity prototype allowed touch/mouse and keyboard user interactions. In comparison to low fidelity prototyping it was very time consuming to create high fidelity prototype and this is exactly the reason why low fidelity prototypes were necessary to begin with. Final Prototype pictures are provided in the appendixes (Appendix D).

4. METHODS

4.1 Context Study

The goal of our context study was validate our idea for creating a connection between the old and younger people through social gardening. For this, we selected an user group consisting of elderly people (aged above 60 years old) and younger people (aged between 15 to 24). To validate our idea, we conducted interviews with seven participants (elder participant: 3, younger participants: 4). As we had two user groups, we collected interview data for elderly participants from their home and for younger participants from the TUT campus. During the interviews, We noticed that users felt positive about the idea and they also wanted to be part of such a community.

4.2 Prototype Evaluation

The developing process of the social garden application for mobile devices includes multiple phases. For this, in beginning we used qualitative context study methods (Interviews) to develop a set of questionnaires and took interviews to understand what is the users perception regarding sharing gardening tools (Appendix B). Secondly, Based on the users ideation for social gardening, we developed a prototype for mobile devices. Thirdly, we used a set of questionnaires to measure how the experience goals are related with the developed application(Appendix C). Using the collected data from the questionnaires, we used Hassenzahl's model (2018) of pragmatic (Instrumental) and hedonic (Non-instrumental) product quality as a guiding theory in the analysis phase to understand the users interaction. For the context study and evaluation, we use the same group of participants.

Our team members first explained the functionalities of the prototype to the participants and then participants used the prototype. Evaluation is done based on the interview result (Appendix C). Details about participants and interview questions are provided in the appendixes (Appendix A).

A short overview of the criteria of pragmatic and hedonic qualities is given below:

Pragmatic Quality (PQ):

We emphasized pragmatic aspects such as easy usability, reliability, performance, and effectiveness of the participants for the social garden application. During the usability study, we asked the participants to describe the usability of the application from pragmatic aspects. We record the participants answer for further analysis.

Hedonic Quality (HQ):

Hedonic quality is a combination of pragmatic and hedonic qualities of a product. With the help of hedonic quality of identification and stimulation, we analyzed participants feelings such as "joy of use", and connectedness.

5. RESULTS

5.1 Context Study

In the first interview phase, among the seven participants six of them showed their interest towards our idea of "Social Togetherness Through Sharing Gardening Tools". Based on the participants study we developed our application.

Almost all the participants (5/7) showed interest to use a mobile app for this purpose. They said, using our application on the smartphone will be easy to use. One elder participants said, "this kind of application will be easy to use in smartphones, I can easily request for a tool from here"(Appendix B: 7). Based on the participants expectation, we developed an application for mobile devices.

The application was designed with easy features so that participants can use it easily. The application feature such as "Available tools" was designed based on participants expectations. Again, among seven participants six of them showed their interest for a fortnightly community meeting and one said, "It is a nice idea. To know the members of the community and rules of the community, community meeting is necessary" (Appendix B: 9).

Finally, some of them thought that elder or younger people can learn something from each other through this community and one participant said "Elder people always like younger people so yes, both can learn about different things from each others" (Appendix B: 5).

5.2 Prototype Evaluation

Relation with Experience goals:

Both the elder and younger participants agreed that they felt "Togetherness" through this app. One of younger participant said "I don't get much time to spend with my grandparents, they live in another city and I also don't have many friends. So, it would be a perfect platform to meet with aged people like my grandparents and also with younger aged people in the community meeting. By meeting with them I can feel togetherness"(Appendix C: 3). Likewise, two elder participants said they would also love to meet with the younger people.

All user's liked the feature of community meeting and they agreed that community meeting could be a way of "Sharing Knowledge". Among three of the elderly participants, one of them said, "In the community meeting, I think I can help people with to teach usage of a tool as I have knowledge about different types of tools" (Appendix C: 4). On the other hand, one younger participant said, "I like gardening but I don't have enough knowledge about gardening tools. If I can learn something, I would love to join the community meeting to get on hand demonstrations" (Appendix C: 4).

Young participants liked the concept of sharing one's tool though one elder participant were not comfortable with this idea and said "who wants to share their own tools? I don't know about others but I won't like to share my tools"(Appendix C: 5). However, other participants expressed their "generosity" to share their tools and knowledge through our application feature named "My Tools".

Finally, according to both aged group, elder people can reduce loneliness through the application. One elder participant said "for different purposes of this application if I meet with people then maybe I will find some friends who have interest in gardening and can spend my free time with them"(Appendix C: 9). However, younger participants said that it will help elder people to lessen their loneliness rather than younger people.

Pragmatic Quality (PQ):

The qualitative result of the prototype shows that it received good acceptance in different aspects of PQ such as manageable and easy to use. This implies, participants gave positive reaction for our application and they also satisfied with the overall usage of the application. Pragmatic quality such as "reliable" received moderate acceptance and they gave comments such as "The idea of "Donation" is good but the application must possess "reliable"(Appendix C: 6).

Hedonic Quality Identification (HQI):

The qualitative result of the HQI shows that the prototype were considered good and presentable. Although the feature of donating money received low acceptance as participants thought that the feature is not reliable so It might occur some error which is not predictable and one participant gave comments such as "The prototype is good but I think, I won't be able to predict the donation error beforehand"(Appendix C: 7).

Hedonic Quality Stimulation (HQS):

The qualitative result of the HQS shows that the prototype were considered straightforward, connectedness, simple and pleasant. Though the prototype considered straightforward, still it considered more generic prototype and participants comments such as "the prototype is so easy to use"(Appendix C: 2).

Finally, the prototype evaluation indicates that our application meets the targeted user experience goals. From the Hassenzahl's model, our application covers all the critical qualities such as easy to use, presentable, straight forward and connectedness quality.

6. DISCUSSION

6.1 Limitations

We interviewed seven participants where three persons were from the elderly age group. We should have interviewed more elderly people to get a clear idea about their need regarding this application. Also, we couldn't arrange a real group meeting between the two age groups. A real group meeting would provide more insights about the application as well as the idea of the proposed community. Also, the idea of connecting people through gardening is challenging for some reasons. For example, we did not focus on the percentage of mass people who like gardening. So, we had no clear idea about how this application will be accepted by the people who are not the target group. In countries like Finland where gardening is very challenging because of the weather and suitable private land. Similarly, the issue is true for very warm countries. Thus, gardening as tool for sharing community can be challenging in some countries.

6.2 Future work

In the future, we can implement the donation option properly to achieve one of the experience goals of our application 'Generosity'. Features like sending a message to other members, recommending this application to others, and sharing events outside the community can be introduced for better usablity. By doing these, users can refer this application to others, make the community bigger, and carry out the next phase plan.

7. REFLECTION OF GROUP WORK

For this group work, we had three submission phase in total. Our four team members work equally in all of the three phases. Though in the beginning it was difficult to communicate with each other and discuss the assignment related problems but slowly we managed to communicate and solve our problem. To conclude, for us, our team members contribution for this assignment is equal.

REFERENCES

Alaimo, k., Thomas, M., and Ober, J. (2000, May). Community gardening, neighborhood meetings and social capital. Journal on community psychology (pp. 496-512)

DIS, I. (2009). 9241-210: 2010. Ergonomics of human system interaction-Part 210: Human-centred design for interactive systems. *International Standardization Organization (ISO). Switzerland*.

Ganglbauer, E., Fitzpatrick, G., Subasi, Ö., Güldenpfennig, F., (2014, February). Think Globally, Act Locally: A Case Study of a Free Food Sharing Community and Social Networking. Journal on CSCW 2014

Hassenzahl, M. (2010). Experience design: Technology for all the right reasons. *Synthesis lectures on human-centered informatics*,*3*(1), 1-95.

Hassenzahl, M. (2013). User experience and experience design. In: Soegaard, Mads and Dam, Rikke Friis (Eds.). ‘‘The encyclopedia of human–computer interaction, 2nd Ed.’’ Aarhus, Denmark: The Interaction Design Foundation.

Hassenzahl, M. (2018), The Thing And I Understanding The Relationship, Chapter 19

Hirsch, T., Forlizzi, J., Hyder, E., Goetz, J., Kurtz, C., & Stroback, J. (2000, November). The ELDer project: social, emotional, and environmental factors in the design of eldercare technologies. In *Proceedings on the 2000 conference on Universal Usability* (pp. 72-79). ACM.

Nargund G. (2009). Declining birth rate in Developed Countries: A radical policy re-think is required. *Facts, views & vision in ObGyn*, *1*(3), 191-3.

Olsson, T., Väänänen-Vainio-Mattila, K., Saari, T., Lucero, A., & Arrasvuori, J. (2013, September). Reflections on experience-driven design: a case study on designing for playful experiences. In Proceedings of the 6th International Conference on Designing Pleasurable Products and Interfaces (pp. 165-174). ACM.

Singh, A., & Misra, N. (2009). Loneliness, depression and sociability in old age. *Industrial psychiatry journal*, *18*(1), 51-5.

APPENDIXES

Appendix A: Background Information of the Participants

Participant 1: Age-65, Gender-Male, Education-High School, Occupation-Janitor

Participant 2: Age-60, Gender-Female, Education-Masters, Occupation-Teacher

Participant 3: Age-63, Gender-Female, Education-High School, Occupation-Unemployed

Participant 4: Age-24, Gender-Female, Education-Masters, Occupation-Student

Participant 5: Age-24, Gender-Male, Education-Masters, Occupation-Student

Participant 6: Age-22, Gender-Male, Education-Bachelor's, Occupation-Student

Participant 7: Age-23, Gender-Female, Education-Bachelor's, Occupation-Student

Appendix B: Interview Questionnaire of phase (1) to understand the users perception:

1. Do you like gardening? Why?
2. Would you like to be part of a gardening community from where you can borrow necessary tools and also add your tools to help the community members?
3. Would you like to share your tools with others?
4. What do you think about the engagement of young people in that community and how they can be engaged?
5. Do you think elder or younger people can learn something from each other through this community? how?
6. Can community of sharing gardening tools would be able to connect elderly with youth?
7. Do you think that a mobile application could be useful for borrowing the tools and be connected to that community?
8. What features the sharing gardening tools mobile application could have?
9. Do you think a monthly or fortnightly meeting idea of that community is a good idea? If yes then why?

Appendix C: Interview Questionnaire of phase 2 to evaluate the prototype:

1. What do you feel after using the prototype?
2. Does it feel easy to use?
3. Do you feel togetherness with the prototype? How?
4. Do you think you can share or teach knowledge with the help of the application?
5. Do you like the idea of sharing own tool?
6. Does the idea of donation is good?
7. Do you think any feature of the prototype is uncertain?
8. Does the search option work perfectly?
9. Do you think in future, using the application you would able to lessen your loneliness?
10. Which one is your favorite part in the prototype?
11. Will you suggest this application to others?
12. Please evaluate this prototype in a scale of 0 to 10

Appendix D: Prototype

From the top left side of figure 1, first one is front page, second one is the features page and others picture shows how they can be operated step by step. From the right side of the figure 2, first page is for donation page and second one is event calendar from which people can confirm community meetings and join the meeting according to the decided event calendar date.

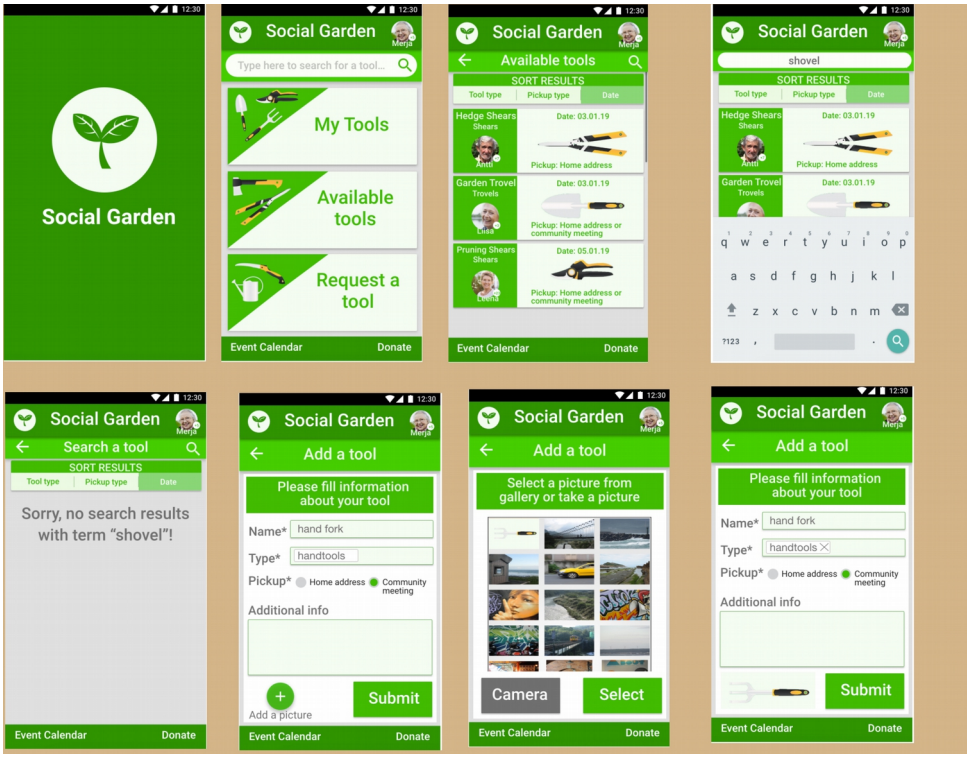

Figure 1: Pictures of the prototype

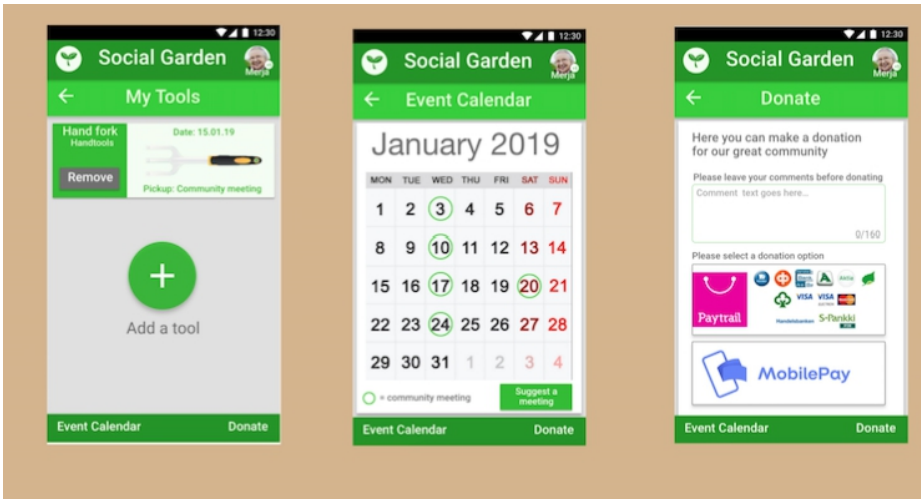

Figure 2: Pictures of the prototype