

CSE 440 Project 2H

Final Report

Broccoli for All

Aishwarya Nirmal, Kelsie Haakenson, William Huang, Yilin Jin

Title

Broccoli for All

Group Member's Name and Roles

Kelsie Haakenson - main writer

Will Huang - jack of all trades

Yilin Jin - design lead

Aishwarya Nirmal - communications/outreach

Problem Statement

A hidden and pernicious hardship of poverty is the inability to provide to fresh fruits and vegetables to one's family, either due to high costs or to geographic distance from supermarkets. Community gardens could be a solution to the poor diet of the impoverished, but they are currently rather exclusive-- it can take on average 1 to 2 years to obtain a plot. Our solution is to create a platform revamping the current community garden process, introducing a volunteering program and a mentorship program while simultaneously streamlining management of the garden. This encourages the community to work together, with existing plot owners opening up their space for volunteers, interested members of the community volunteering their time and effort in exchange for a portion of the harvest, and new gardeners learning important agricultural skills from those more experienced.

User Research, Summary and Participants

Summary of key findings or takeaways

After our user research, we got some key findings and takeaways. We interviewed three individuals: a community garden coordinator, a food bank coordinator, and a personal gardener. We chose these particular interviewees because we felt that they could provide a diverse set of perspectives on gardening from individuals that could be directly affected by the product that we develop. To summarize, we found that there needs to be a better, more centralized source of gardening knowledge to help interested beginners to start gardening. Community gardens work well for people who are interested but are unable to start their own gardens due to the cost and time commitment. We also learned that there is a strong connection between gardens and food banks; the food banks receive donations from both the community gardens and personal gardens. Some community gardens have strong connections to food banks, while personal gardeners just donate at their discretion. We learned that both food banks and community gardens are fairly low-tech when dealing with day-to-day operations; better technology might increase the efficiency of both community gardens and food banks.

Contextual Inquiry Participants

Alice - Community Garden Coordinator

Our first interview was with Alice, the former manager of the University Heights community garden. Currently she is a P-Patch coordinator, overseeing over 90 gardens and 6000 members. Alice gave us some important information regarding community garden management, revealing that some of the principle challenges include keeping track of who is participating at a garden at any given time, as people come and go from the program, difficulty teaching new gardeners, and difficulty tracking donations. She explained it is difficult for potential gardeners who are interested in the activity to get started, as it is hard to gather the necessary information to learn how to garden. Donation records are difficult to maintain because they are all done through paper.

Suzanne - Food Bank Coordinator

Our second interview was with Suzanne, who is a coordinator at the food bank in Ballard. She explained to us that for the Ballard food bank currently has a pretty good relationship with the community garden in the area, and that generally seems to be the case for food banks/community gardens within close vicinity in the Seattle area. The donation process is not very technology dependent. The food bank recovers food 6 days a week, picking up food from grocery stores, bakeries, and community gardens. The Ballard food bank does have some level of coordination with the local community gardens in terms of food pickup times and events, and the two do take input from each other on what is and isn't working. There are some people who donate food from private gardens, but Suzanne mentioned that the biggest challenge is making more people aware that they can donate from their personal gardens. One thing that the city of Seattle has been working on is a project called City Fruit, through which people sign up to have produce gleaned by others to be donated to food banks, including the Ballard one. Suzanne explained that the food bank is open to both fresh produce and canned goods. The management prefers fresh produce as that encourages consumers to eat healthy. However, many of the customers to the food bank express that they prefer the canned foods because that is what they have been used to eating for much of their life. An interesting thing that Suzanne brought up was that she did not seem to want a new technology for any of the processes that the food bank currently performs, as food banks generally have small staff who are not very tech-savvy, and the current non-tech based system works pretty well, in her opinion. She says that she would prefer to see leverage of systems that are currently in place.

Jane - Personal Gardener

Our third interview was with Jane, who tends a large and varied personal garden with her husband. We found the trend of difficulty beginning to garden that Alice mentioned was reflected in Jane's comments as well. She explained many ways people could learn about gardening: home improvement stores, the internet, community events. However these sources of information are very varied and it may be difficult for a novice to search for the information he/she needs. Jane also gave useful insights regarding the difficulties of gardening, describing the process of finding suitable land with enough sunlight, preparing the soil, and tending the plants. She explained there are the upfront barriers of having property in the first place, and the costs for soil and seeds, and water costs which we had not considered previously. She also indicated there was a continuous time commitment, with work every other day during planting season, which may be difficult for those with overwhelming work schedules. We also learned more about the options available to personal gardeners to donate food, which consist mainly of food drives through schools, the workplace, and local community organizations, or through a

donation service, called Walk and Knock, which sends a brown bag sent through the mail once a year. The bags are then filled with food and picked up by volunteers who deliver them to the food bank

Themes and Results

Bringing in new people to join a community is essential to its growth. Because of this, one common theme from the inquiries is getting beginners to learn how to garden and eventually join a community garden. Many people do not have the land or the time to tend their own garden, as well as ways to cover the costs of the tools and utilities. For this reason, interested individuals may want to join a community garden. However, a big issue that was raised is the difficulty in which the beginners face when starting out and learning how to garden. Our participants have suggested a centralized source of gardening knowledge, instead of the many different websites and home improvement stores, which all just contain bits and pieces of different information. They also mentioned that having gardening experts or mentors within and on the grounds of the community garden would help out the novice. This suggests a task which teaches the user all important and basic gardening knowledge and a system which passes knowledge from the experts to the beginners.

Technology is becoming more and more prevalent in our lives, which brings us to another important theme. The representatives from the community garden and the food bank have both noted that their organizations lack technology. Alice said that it would be great if her organization. Suzanne felt no new technology was needed, however, noting that the current technology-less system works just fine for her.

Another theme we noticed was difficulty in record keeping or information collection. This sentiment was most prevalent in Alice's interview, as she explained gardens have difficulty maintaining records as to who is participating at the garden at a given time, and which plots are donating to food banks. She said most of the information is handled through paper records. Jane also mentioned it may be useful for all useful information a novice gardener, personal or communal, may need to know to be collected in one easy to access place. While Suzanne from the food bank did not indicate a difficulty recording information, or a strong desire to use technology to simplify the process, the other two did feel technology would be useful in organizing and publishing certain information.

Task Analysis Questions

1. Who is going to use the design?

This design can be helpful for community garden coordinators by providing a convenient tool to manage member's schedule and track surplus food donation. Also, this design can help food bank coordinators to reach out food resources and track donations easily. For beginners who want to start planting, this design can serve as a central source gathering all knowledge about gardening. Low-income people who can't afford fresh produce can use our design to find places and tools to grow their own food. In addition, this design could assist personal gardeners who want to find groups to plant together.

2. What tasks do they now perform?

According to our interview results, many of the community garden coordinators are having problems managing and updating the garden's schedule and events. Alice, the coordinator we interviewed, said they don't have a certain tool for tracking food donation. Currently, they only track by writing on piece of paper. Food bank coordinators also use similar low-tech strategies for keeping track of donations, but Suzanne, the food bank coordinator that we spoke with, feels that this is not a problem for her position. Those learning how to garden currently search online for information or ask neighbors or sales in garden supply stores, which requires a lot of time and effort. For personal gardeners, they currently reach for neighbors and friends to plant together. Low-income citizens currently go to food banks or buy bad quality food that they can afford to support themselves and their families.

3. What tasks are desired?

We want to provide coordinators a better way to do the management and food donation tracking. Furthermore, we hope to provide personal gardeners and beginner gardeners an accessible source to find groups and learn gardening skills, and help novice gardeners at a community garden learn from their more experienced peers. To aid with this, we would like to help novice's who search for information by grouping the necessary and relevant information on learning how to garden together. We also want to help low income people to get higher quality and healthier fresh produce. To this end we want to facilitate donations from community gardens to food banks, and raise awareness that personal gardeners can donate produce to food banks.

4. How are the tasks learned?

The design will be intuitive based on people's past knowledge (i.e., updating their schedule and availability for work on a calendar, tracking donations as tracking shipping status, check notifications about events or gardens' condition, etc.). It should be easy for non tech-savvy people to pick up, since many operations in the field currently occur through paper.

5. Where are the tasks performed?

Generally, the task can be performed in offices, homes, or anywhere with internet access since our design most likely will consist of or incorporate a mobile app. Coordinators can use it during work at the garden, food bank, or other locations that they may need to visit. Other users can use it when and where needed, including when they receive notifications from the coordinators.

6. What is the relationship between the person and data?

The data involved in our design will likely involve donation records and work records. These pieces of data should be kept private to each individual. Other data in our design includes information about community garden produce, progress, and events. This aspect will be open to all members of the community. People can also update their availability or schedules which are accessible by only themselves and coordinators. Overall data regarding donations and harvest numbers should be available to community garden management and food banks as necessary.

7. What other tools does the person have?

Gardeners have the internet, friends, neighbors, and home improvement employees as resources for learning about how to garden. Those in community gardens also, to an extent, have the help of more experienced gardeners. They also have an extensive but complicated information resource on the P-Patch website itself. Food banks have the tool of the Walk and Knock service or other food drives as sources for donations, and personal gardeners have the same tools for donating. In terms of technology, all parties use email/phone for communications and paper records, in general.

8. How do people communicate with each other?

Our design should allow gardeners to communicate remotely with one another and the management. It should also allow garden management to communicate with food bank management remotely. It should also allow personal gardeners to get in touch with these groups, a channel of communication that is currently severely lacking.

9. How often are the tasks performed?

With our design, people should be able to perform tasks for frequently and efficiently. Right now, community garden members are only required to participate in the garden work for a minimum of 8 hours per year. Our design may not change this requirement, but it should encourage individuals to participate for more time than the minimum. Our design should also facilitate the frequent tasks of garden and food bank coordinators.

10. What are the time constraints on the tasks?

Donations must be done while produce is still fresh. That is the main problem Suzanne mentioned regarding produce rotting, was that donated food could be given when it already was going bad. Donated food must be distributed quickly to those who need it, but from our interviews this does not sound like a problem. Other time constraints include the seasons for food cultivation, and member attention spans and patience for learning how to garden.

11. What happens when things go wrong?

Technical issues and bugs aside, a couple things could go wrong. Methods of teaching are often subjective. Our tool's task of teaching beginners might not contain the best knowledge. They could somehow be discouraged after trying it out, which undermines the purpose of integrating new members into the gardening community. Also, Community garden and food bank members and coordinators might find the tool's new high-tech methods of record keeping, information collection, and coordination hard to adapt to.

Proposed Design Sketches

Design 1

Our first design uses a grid layout to represent the garden. Each square corresponds to a plot and contains information about it and its status. Above the grids are several tabs which filter the information that is displayed in each of the grids. Under the volunteer tab, clicking on a square brings up a volunteering application. For owners, instead of the application, an option to list or unlist their plot will be presented. Under the garden status tab, garden status will be displayed, highlighting those plots that require the most assistance. This design is made to be intuitive because of the close resemblance of the interface to the appearance of the actual garden and the division of plots.

Task 1: Garden status

The basic statuses are displayed right on the grid, and clicking on the tabs above the whole grid will bring up different information. Clicking on the grid itself will bring up detailed information about health condition of plants.

Task 2: Volunteer application

People who don't own a specific plot can click on its corresponding grid square for detailed information. They can determine a plot square's availability based on the color/symbol of the square on the grid. If the owner has listed their plot, a button below the information will appear, and clicking this button brings up a volunteering application to work on the plot.

Task 3: Listing for volunteers

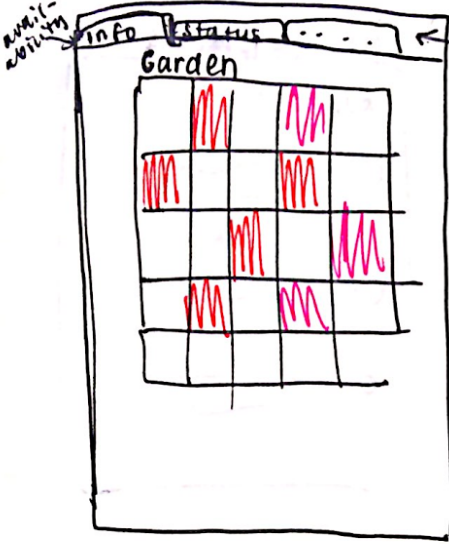
Owners of the plot can click on its corresponding grid for detailed information. Below the information contains a button to list or unlist their plot.

Task 4: Scheduling

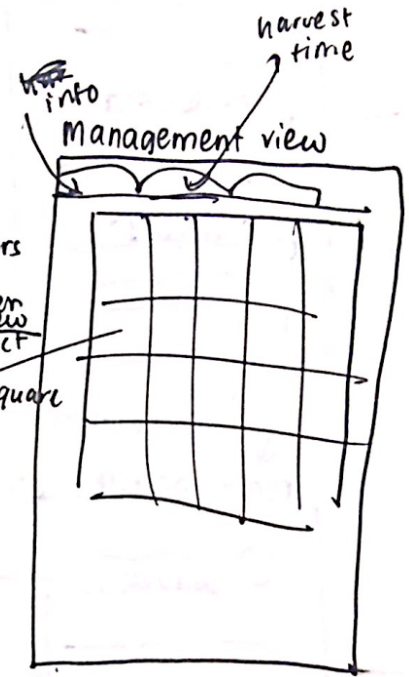
Community garden coordinators will receive a similar view of the grid layout, but with different functionalities. They can click on a square to view and update a schedule of work to be done on the given plot.

PLOT / GRID

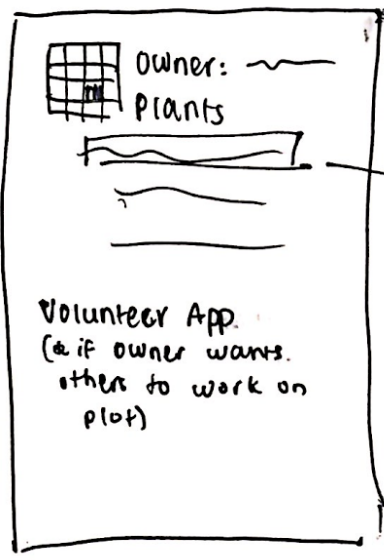
Tasks: garden status, management, volunteer app,



listing for volunteer
other tabs for dif. filters
← Color coded plot on garden view
select

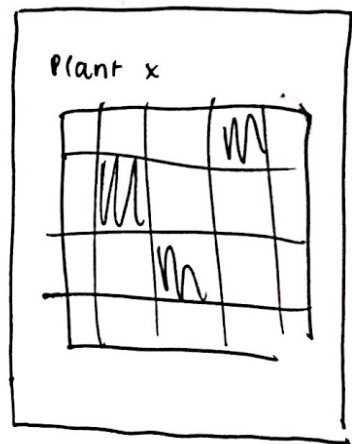


select square on grid



more specifics on the plot

click plant



volunteers can figure out plot they want to be part of based on what plants they grow

* need scheduling interface (maybe linked to harvest time)

Design 2

Our second design is a blog/social media platform for gardeners to communicate with one another. Participants can post about topics such as needs for supplies, needs for volunteers, gardening events, etc., and they will be required to tag their post with one of the given tags. Volunteers can click on the subject name to filter to see that subject's post. Volunteers can also click a button on the left of subject name to view one's personal profile, which contains skill level and plots information. Community garden participants and managers can contact with each other using our design.

Task 1: Mentorship

By providing skill level and availability in personal profile, gardeners can look through others' profiles to find right partners to work together. Experienced gardeners and beginners can connect with each other by messaging.

Task 2: Posting skill level and availability

A user can create a profile and enter information regarding their skill level and schedule. The profile is then available for all other members of the community to view and send messages to.

Task 3: Listing for volunteers

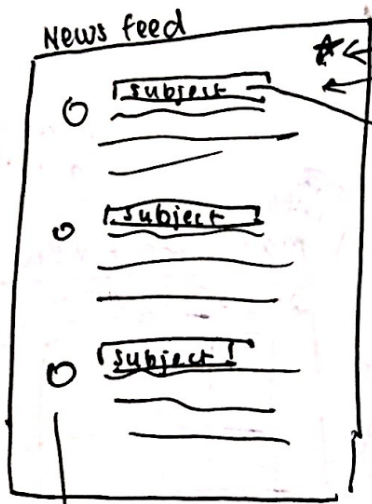
Plot owners who need help for their plots can list their information of plants and what skill level volunteer do they want to get help from. They can describe their needs in detail by writing a post on the blog.

Task 4: Volunteer application

A prospective volunteer can create a blog post to inform plot owners that he/she is available to work. They can also reply to plot owner listings about needing someone to work on their plot by directly messaging the user who posted the need.

BLOG / SOCIAL MEDIA

Tasks: mentorship, post skill lvl/availability, list for volunteer, apply for volunteering

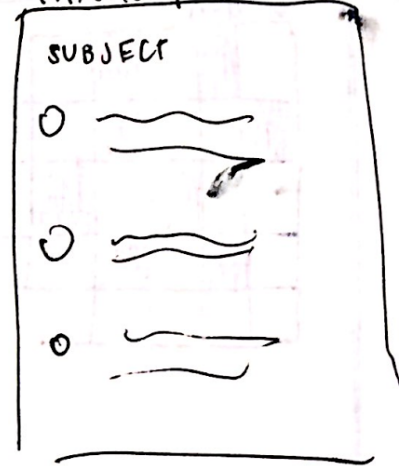


Notifications
preetermined subjects (help to filter thru topics)

ppi ~~the~~ post about what they need help w/ in garden

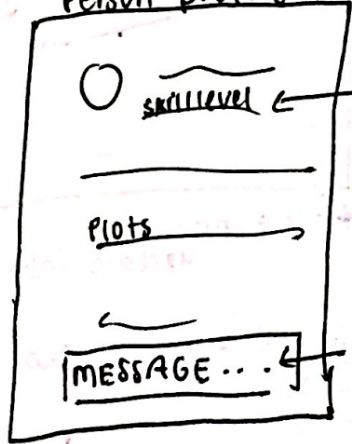
select subject

Filtered posts



click on person

Person profile



use this to connect w/ ppi you could mentor or that could mentor you.

type here to send message

Design 3

Our third design is more of a management view, allowing the garden manager to see his/her own network with other coordinators from food banks and community gardens. User can click on one's profile photo to see personal information, and click "contact" button to connect with that person. In our design, garden managers will receive notifications about garden status. For example, if status of one plot has been "need water" for three days, but nobody took any actions, the system will generate an automatic notification to the manager, and the manager can click on the "notify" button to notify all participants. Garden coordinators can also check their inbox to see messages they got from participants or other coordinators. Using this design, garden managers can check members' mentorship matching and volunteering network, and click profile photo to participants' personal information. They can update mentorship connections by dragging existing connections to new profile photo endpoints, drawing in new connections, or erasing unwanted ones. Managers can also check and edit working schedule of the garden.

Task 1: Garden Status

Garden manager will receive an automatic notification if some plots are not in good condition and no participants updated status of that plot for three days.

Task 2: Mentorship

When a garden is first established, an algorithm can sort contributors based on skill level, availability, and preferences into suggested mentorship pairs or groups. These are shown by lines connecting profile pictures between skilled and novice gardeners. Coordinators can drag links between people to alter mentorship.

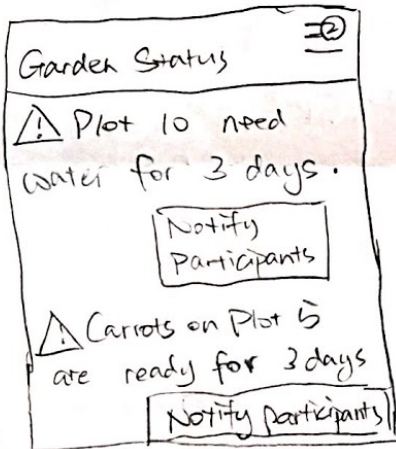
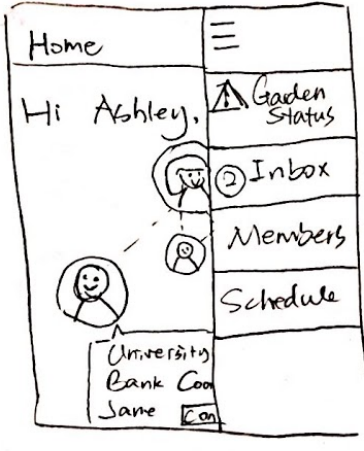
Task 3: Scheduling

Garden coordinators can make a working schedule according to member's availability. Coordinators can click on various days in the calendar, and schedule events in the times listed on the next page.

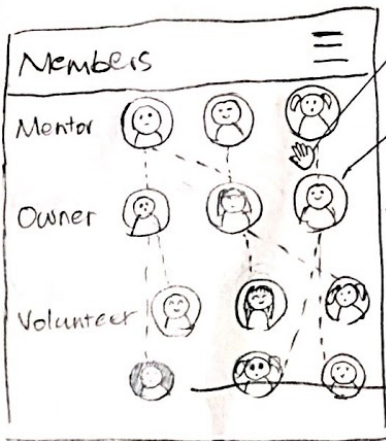
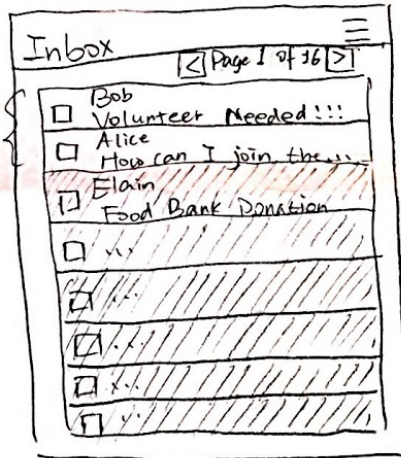
Task 4: Listing Volunteers (managerial view)

Coordinators can see connections between volunteers and plot owners in "Members" page.

Design #3: Management view



Unread Messages



Manager can drag links to alter mentorship.

Click to see information

Volunteers no longer available have grey profile photo



Members working on that day

Design and Task Choice

We have decided to go forward with our first design, centered around a grid layout representing the physical plots, with some more managerial aspects of the third design integrated into it. We believe mimicking the real world organization of the garden will be the most intuitive design for users varying widely in terms of age and technical literacy. This design will also bring clarity to management, improving existing paper recording methods mentioned in our interviews by organizing records digitally and around each plot. To facilitate participation of those in poverty, our design will incorporate a tablet or community display available at the garden for onsite updates or volunteer applications for those who do not have access to a smartphone, but also a companion mobile app for the convenience of other gardeners and management. Our two tasks were selected to maximize community engagement between those of different economic backgrounds and facilitate cooperative work within the garden. In our secondary research we learned community gardens struggle because most contributors work individually, assume others are helping take care of the plots, and neglect their work as the garden dwindles. We also found that a volunteer program does not currently exist, and it can take 1 to 2 years for interested applicants to receive a garden plot. Given the evidence we found of the inability for the poor to purchase fresh produce, this exclusivity of community gardens further bars low income families from a possible solution to their plight. We propose first an ability to monitor garden status and notify gardeners of plots that need attention, and second a volunteer application to allow interested participants to volunteer on an existing plot in exchange for a portion of the harvest.

Written Scenarios

Task 1 (Displaying and updating the garden's status)

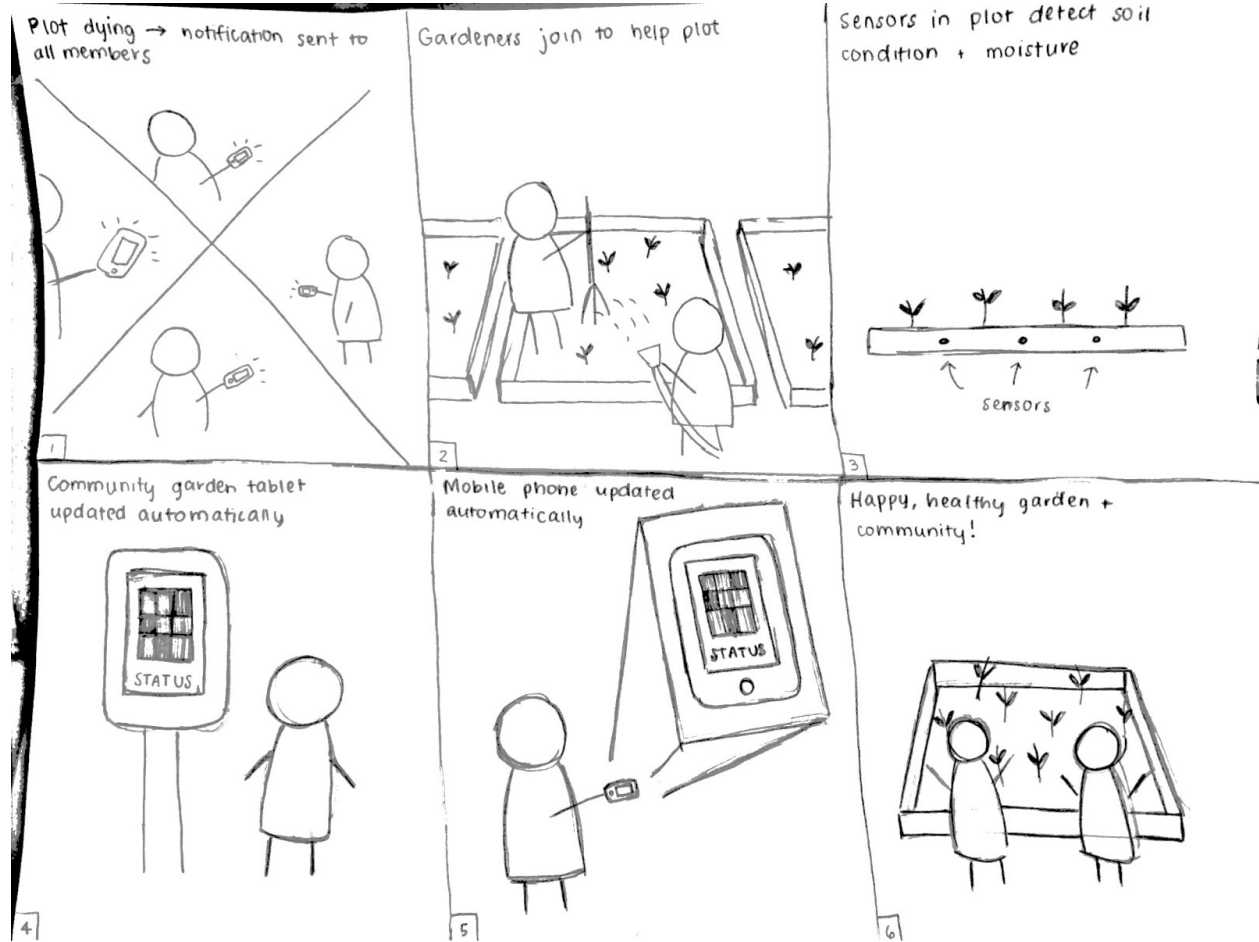
Members of a community garden, including Haley the owner and Robin a volunteer, receive a notification from the app on their phones. The notification states that a particular plot at the community garden is in need of watering and shows its location. Haley and Robin go to that plot and water it. After watering, sensors in the soil register the plot's moisture, and update the garden's status in the app. Haley opens the app on her phone, and sees that their thirsty plot's square is no longer red, but green and in a healthy state. Robin notices the plot has updated on the tablet as well as they pass by to leave, their work done for the day.

Task 2 (Volunteer application)

As Phil browses the produce section at the market, he realizes that he cannot afford to regularly buy fresh produce. Phil then visits a community garden which uses Broccoli for All's technology. He opens up the application on his phone that is associated with the garden and decides to volunteer on a plot so that he could get some fresh produce in return. Phil selects the tab which shows which plots are available, and taps a white square, which brings up a separate window with information about the corresponding plot. Phil taps the "Volunteer Application" button at the bottom of the window and sends his application to the owner of the plot, Ellen. Ellen, having seen the notification, accepts Phil's application. Phil and Ellen work on the plot together, and then Phil receives his portion of the produce to enjoy.

Storyboards of Selected Design

Displaying and updating the garden's status



Volunteer application

