plantr

TEAM

Jen Jianfen Zhang: *project manager; ideation; story and scenario development*

Jory Rice: *user study; participant analysis; ideation; writing*

Paul Bartell: *user study; participant profiling; ideation; writing*

Whitney Schmidt: *user study; task analysis; ideation; writing*

PROBLEM AND SOLUTION OVERVIEW

Many people like having plants in their home or office, but often forget to attend to their needs on a regular basis. While most people know basic plant care, they tend to not plan their plant care in advance. Nearly everyone who takes care of plants has had a plant die. The chief cause is forgetfulness, specifically when the plant owner forgets to water their plant. The second main cause is the lack of knowledge regarding the plant's specific needs, which can lead to improper care, placement in harmful environments, and disease.

Our solution centers around a smart phone application which provides both real-time, species specific information to plant owners about their plants. Using a combination of sensors on each plant, users can get up to the minute information on the soil and environmental conditions their plants are living in. Coupled with a database of care instructions, Plantr allows the plant owner to be proactive rather than retroactive in plant care.

CONTEXTUAL INQUIRY PARTICIPANTS

Overview

We interviewed and observed different potential users of Plantr using contextual inquiry methods. All but one of our interviewees were found and interviewed in the indoor plants section of Sky Nursery. We chose to go to a nursery because we thought that it would be easy to find potential users of Plantr there. We encountered difficulty in finding plant owners who were willing to be observed while taking care of their plants, so most of our inquiry was in the interview format, instead of observation. Plantr is focused on plant owners' general care habits more than the physical mechanics of the care process itself, so it turned out to be most useful for us to ask participants about their habits instead of observing them taking care of their plants.

The format and general style of our interview was very much like that of a master and apprentice. We asked participants questions about their general care habits and experiences

with plant care. We prompted participants to confirm what they had previously said or to learn more about something mentioned only briefly in a prior answer.

Kacy

Kacy is a plant care specialist who works in the indoor plants area of Sky Nursery. She has been with Sky Nursery for 10 years, and has a degree in horticulture. Though plant care professionals are not a target group of users for Plantr, we thought it would be useful to interview Kacy to see how plant care works on a large scale. Additionally, we wanted to ask about common plant care problems customers sought help with at the nursery. As Kacy answered our questions, she frequently pointed out or took us to different areas within the nursery to demonstrate what she was explaining. Specifically, we looked at and queried her regarding her work area, which was behind the register in the indoor plants section.

Lucy

Lucy is an environmental chemist in her mid-forties who works full time from home. She has two boys and is the only person in her house who takes care of the houseplants. Lucy claimed to know little more than the bare-bones basics of plant care. We chose Lucy because she typified two of our main categories of users: plant-owning adults and non-expert plant caretakers. We interviewed Lucy by asking her a series of questions in the indoor plants section of Sky Nursery.

Caroline

Caroline is a part-time employee at the Seattle Department of Parking and Transportation. She shares a house with her teenage daughter and husband, and is between her mid-forties and early fifties. She is the only member of the family who takes care of the plants, and considers herself relatively experienced in plant care. We interviewed Caroline because she was confident about her plant care skills and represented a somewhat expert plant owner.

Jack

Jack is a PhD student in the Computer Science and Engineering Department at the UW. He has taken care of flowers for years, and cares for all of the plants in the CSE building (5-7 plants). We chose to interview Jack because he represented a different age group, and took care of plants that were in his workplace, not his residence. Jack was interviewed in the CSE building.

CONTEXTUAL INQUIRY RESULTS

Plant care routine

None of the people we interviewed had a schedule or established routine for caring for their plants. Jack waters his plants twice a week, much more frequently than the other interviewees. He mentioned that he occasionally forgot to water them, especially some of his plants located in

out-of-the-way places. Caroline waters her plants the least frequently, only about twice a month, spending approximately one hour per month caring for them. Lucy was often busy during the week, so she usually forgot to water her plants until the weekend, when she had more free time. Even the nursery staff did not have a fixed schedule for plant care: the employees watered plants when they needed to be watered, and they consulted a log to keep track of what had been watered recently. This log was also used to coordinate between two nursery workers to ensure that plants got the proper amount of care.

Determining a plant's needs

The methods people use to determine the needs of their plants were imprecise and required no specialized equipment. The most common way the interviewees figured out what to give their plants was by visual inspection. Jack, Caroline, and Lucy all looked at the plants to decide whether or not they need to be watered. They all said they had acquired experience over the years, so they had a general idea of how much care each plant needed. Both Caroline and Lucy said they had intuition about the proper amount of water and sunlight each plant needed. In addition to visual inspection, Lucy touched her plants and Kacy felt the soil of her plants to get a sense of the plants' health and their watering needs.

Participants had multiple sources of information for determining the optimum plant care. While Jack did not seek out plant care advice, the other interviewees did. Caroline and Lucy used the Internet to find information about plant care for specific plants, and both came to the nursery to get ideas and suggestions about plant care from nursery staff. With each plant, the nursery includes a tag that gives basic care advice specific to the plant, which Caroline found helpful. Kacy recommended consulting reference books for plant care information. She also said the Internet can be very useful, especially if a person searches using the Latin name of the plant.

Kacy said that many plant owners tended to interact with their plants more than necessary, over-watering and over-fertilizing plants to death. She also pointed out the orchids, noting that many orchid owners killed their plants by placing them in drafty, cold locations.

Anticipatory buying

Participants kept environmental and personal care habits in mind when choosing new indoor plants. Caroline picked a spot in her house to put the plant before buying it, so that she had an idea of the specific environment the plant would be dealing with. She also chose plants that required minimal care so that she could forget to water plants without harming them. Lucy and Kacy kept in mind the fact that they live in Seattle, where natural sunlight is not as common as it is in many other areas.

Handling plant distress

All participants had experience with unhealthy or dying plants. When plants were not doing well, participants tended to alter their care habits to try to save the plants. Both Caroline and Lucy

tried moving plants to different rooms in order to find a better place for a specific plant. Lucy moved an ill plant into the bathroom, which had a different amount of light and heat, and this relocation saved her plant. Caroline also mentioned dealing with a spider infestation, which she countered by re-potting the effected plants. The people we interviewed sometimes sought help and additional information using the methods described earlier to try and save their plants. They consulted friends, professionals, and the Internet. Sometimes plants were neglected for too long to be saved: Jack and Lucy both had plants that died due to lack of water. Jack also had a plant that became unhealthy for unknown reasons after he bought it. He did not know what to do, so he let the plant die.

EXISTING AND NEW TASKS

Easy task - determining a plant's specific care needs

Julie is a 53-year-old computer programmer who works in Legislative Affairs for the Alaskan government. She lives alone in a small house on the outskirts of town, and works 40-50 hours per week. Her friend, Alice, gives her a miniature rose plant as a birthday present.

Julie has little experience with taking care of plants, and no indoor or outdoor plants that she maintains on a regular basis. The rose's tag indicates that the plant needs 4-5 hours of sun per day and a temperature between 45 and 65 degrees Fahrenheit. Julie wants to know whether the rose requires direct or indirect sunlight, how often she should water it, and if she needs to fertilize the plant to keep it healthy. She is also interested in finding out when and how to remove dried blooms and prune the rose in order to maximize its flowering time.

Most contextual inquiry participants learned to take care of plants via trial and error. Lucy and Caroline moved plants around until they found an environment that the plants thrived in. Kacy, the horticulturalist, noted that many people hurt their plants by "babying" them or over-watering and over-fertilizing. She also mentioned that orchid buyers often damaged their plants by placing them in drafty areas. This indicates that lack of knowledge with regard to a plant's specific needs can hinder proper plant care.

Moderate task - remembering to care for a plant

Andrew is a junior in Civil Engineering at the University of Washington. He lives in an apartment with two roommates. Andrew spends most of his time attending lecture, studying in Suzzallo Library, or working as a lab assistant at one of the on-campus labs. He uses his apartment mainly to sleep and get ready in the morning.

Andrew keeps two cacti on his bedroom windowsill and a small ficus tree in the shared living room. Plant care is low priority for Andrew because he is busy with classes and work, so he waters his plants whenever he happens to notice that they are wilting and occasionally gives them a few drops of Miracle-Gro. Andrew has difficulty remembering to take care of his plants because he does not spend much time in his apartment. He struggles to remember to water the

ficus tree because he does not frequent the living room.

Andrew would like to water and feed his plants on a regular schedule, but he always seems to have other, more urgent responsibilities.

None of the participants used a written or electronic scheduling aid to plan out watering and fertilizing. Instead, they used visual and tactile cues, like leaf color and dampness of soil, to determine when plants needed attention. Plants that are out of sight are difficult to care for, because owners are not visually reminded of their needs. Additionally, these cues can be misleading or hard to pick up on. Lucy indicated that some of her flowers were particularly hard to care for because she was unable to tell whether they needed water. She also cited under-watering due to forgetfulness as a cause of plant death. Caroline anticipated forgetfulness and bought plants that required minimum care in order to ensure their survival when she did not remember to care for them. Participants had difficulty with watering, fertilizing, and other tasks involved in plant care that must be completed regularly to guarantee a plant's survival.

Difficult task - identifying and managing causes of plant distress

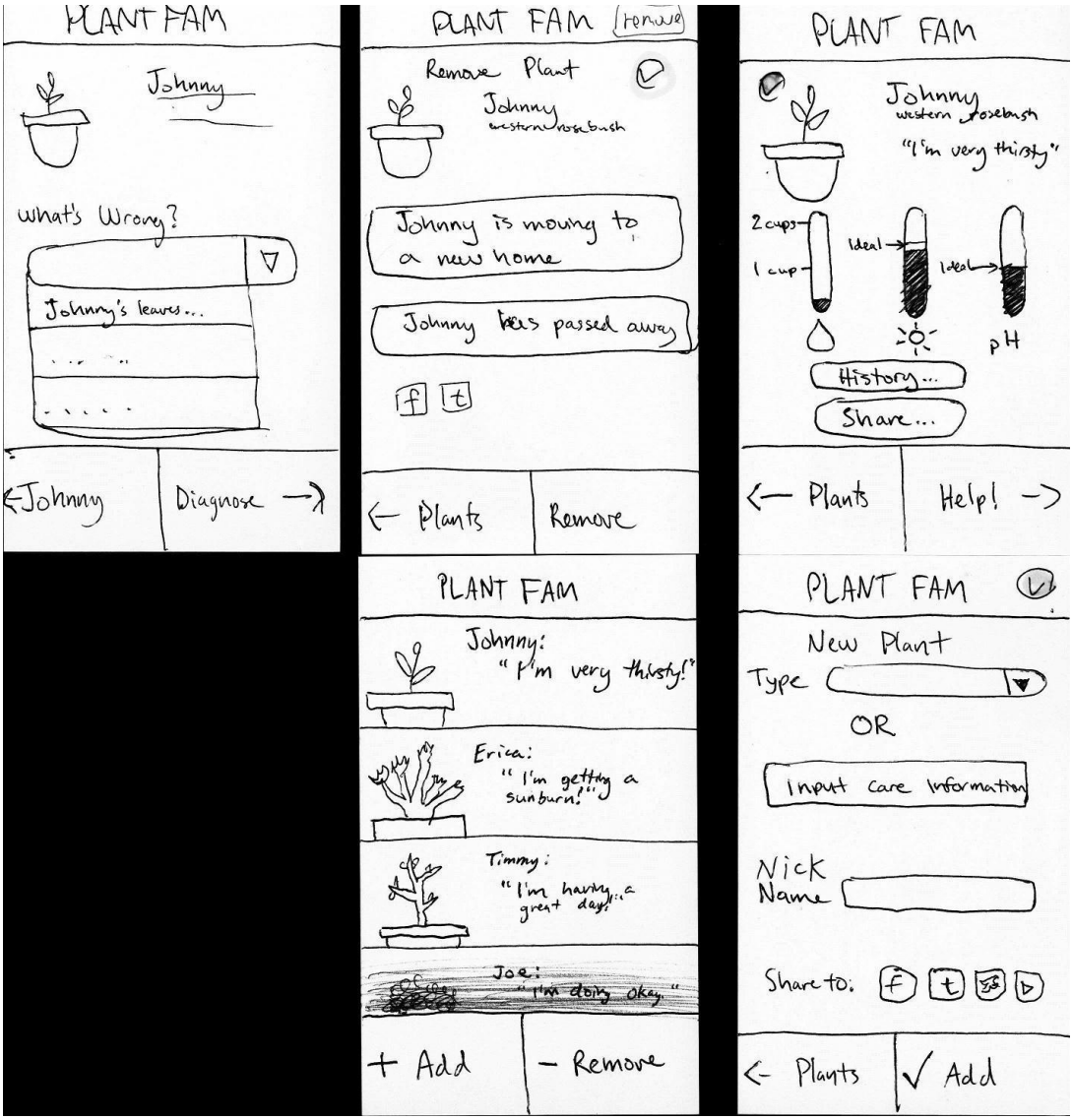
June is a 68-year-old retired legal consultant who shares a small house with her husband in Seattle. She handles most of the housework, including caring for the avocado tree that her mother gave her as a small child. The tree is in her kitchen, where she waters it every two weeks and fertilizes it with special Citrus & Avocado fertilizer on the first of every month. June learned basic plant care from her mother and is not an expert.

June notices half a dozen pea-sized, reddish brown spots on the new growth leaves of the tree. She has never encountered problems with the tree before, and is concerned. She would like to know the cause and possible treatments for the spots.

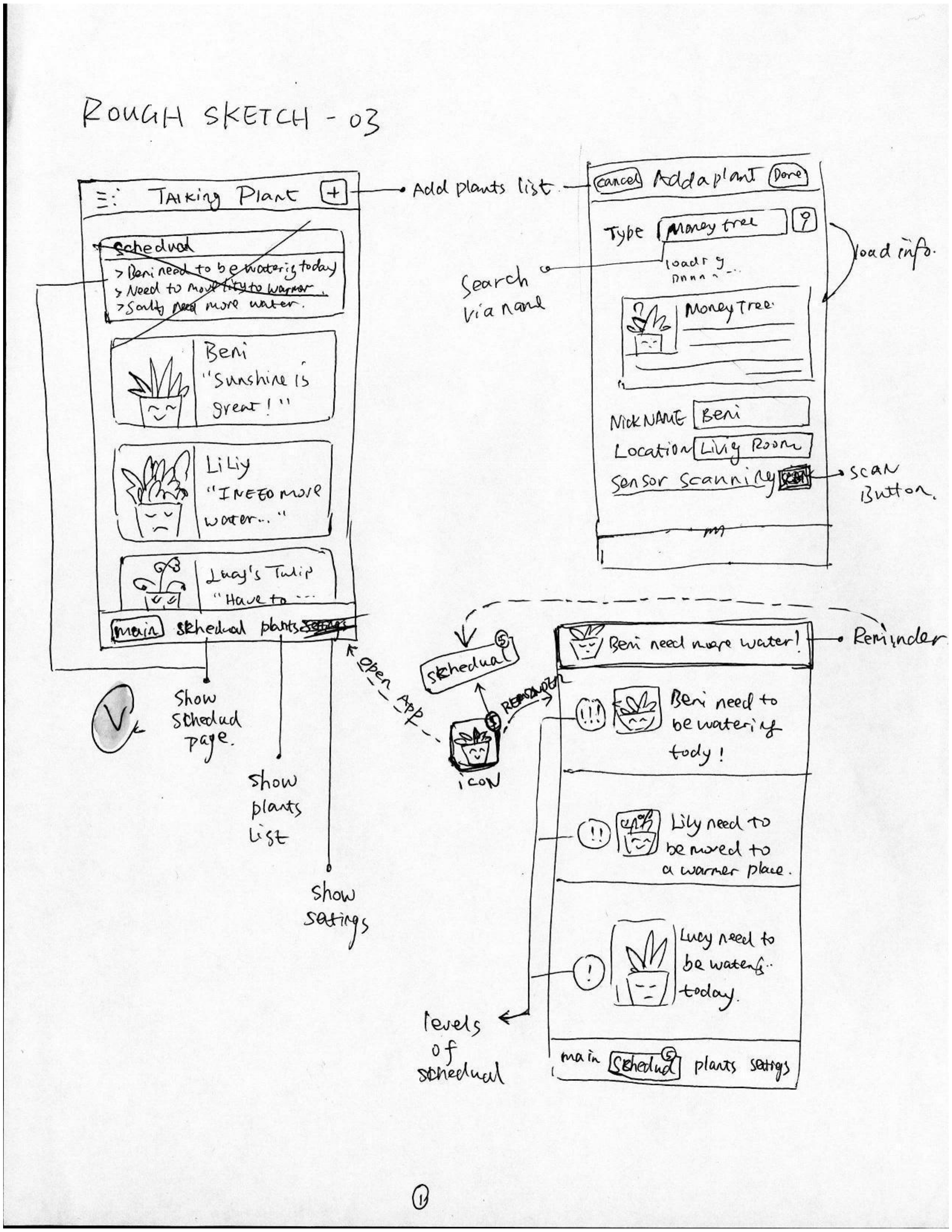
Plant pathogens are an irregular but serious problem for plant owners. They can lead to plant death, and have potential to spread to nearby plants. Caroline mentioned having difficulties with a spider infestation on several separate occasions. She counteracted the spiders by repotting the infested plants, but said that she was unable to prevent some of the infested plants from dying. Jack had a plant that died for unknown reasons soon after he purchased it. He did not go to a nursery or call a nursery to seek assistance because he was not invested in the plant enough to warrant the extra effort required to get help. Diagnosing the cause of plant distress is necessary before proper treatment can be applied, but determining the cause of plant distress can be inconvenient and owners often feel that they are not knowledgeable to handle the problem without additional help.

DESIGN SKETCHES

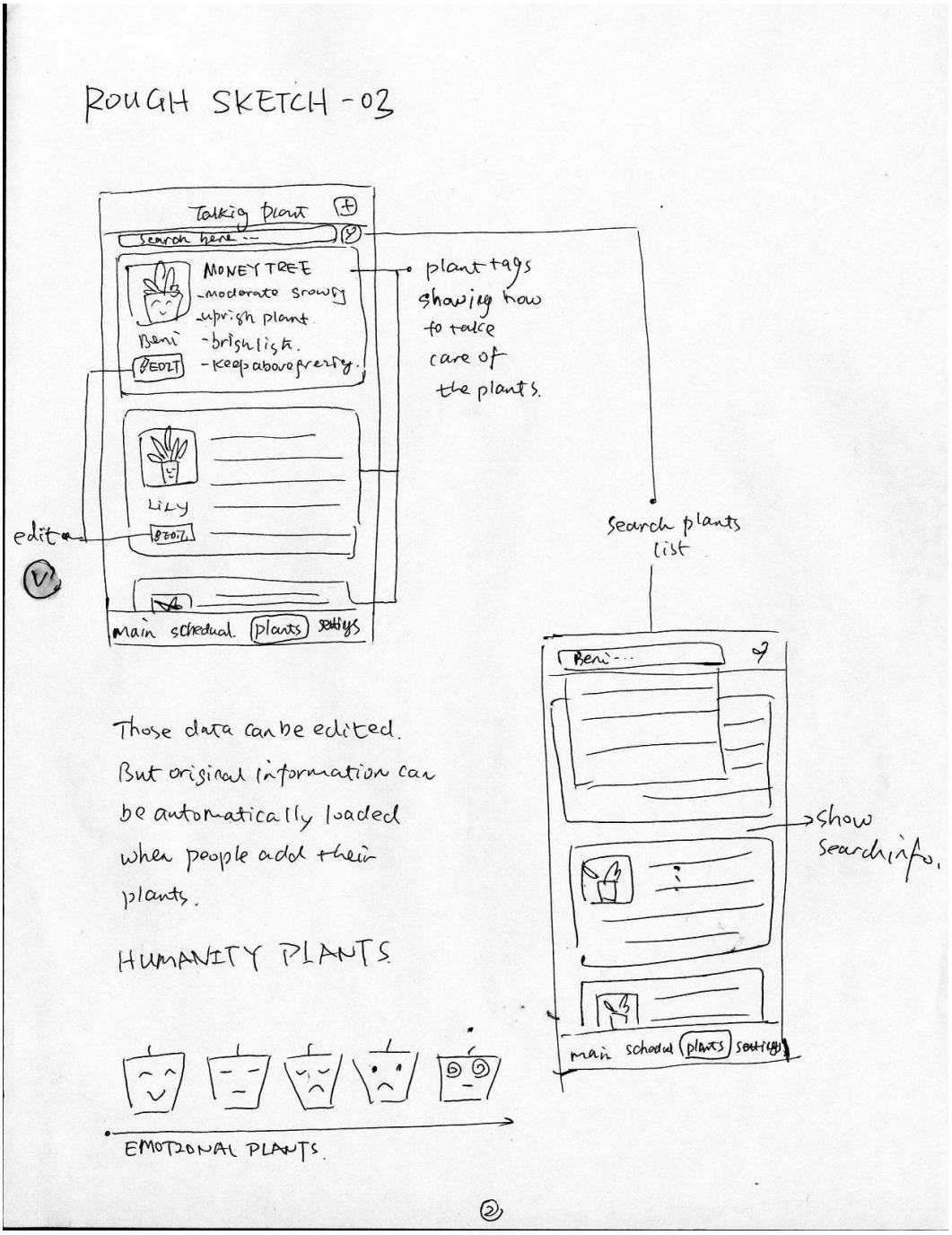
Design 1



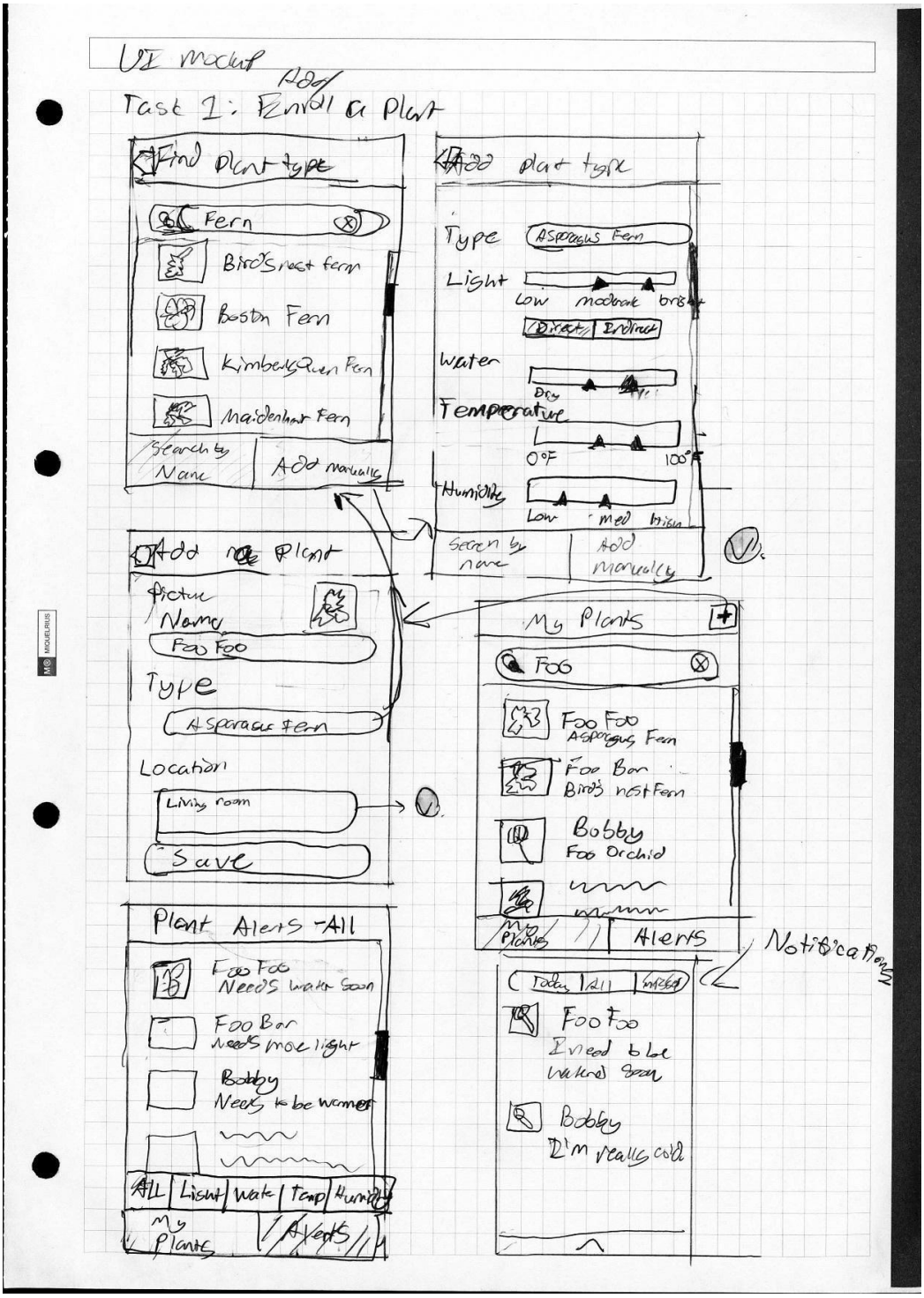
Design 2


ROUGH SKETCH - 03
Talking Plant
Add plants list
Cancel
Add a plant
Done
Type
Money tree
load info.
Search via name
Money Tree
NickNAME
Beni
Location
Living Room
Sensor Scanning
Scan Button.
Schedual
> Beni need to be watering today
> Need to move Lily to warmer
> Sally need more water.
Beni
"Sunshine is great!"
LiLiy
"I NEED more water.."
Lucy's Tulip
"Have to ...
main
schedual
plants
settings
Show schedual page.
Show plants list
Show settings
open App
schedual
icon
Beni need more water!
Reminder
Beni need to be watering today!
Lily need to be moved to a warmer place.
Lucy need to be watering today.
levels of schedual
main
Schedual
plants
settings

Design 2 (continued)



Design 3


UI mockup
Task 1: Enroll a Plant
Find plant type
Fern
Bird's nest fern
Boston Fern
Kimberly Queen Fern
Maidenhair Fern
Search by Name
Add manually
Add plant type
Type
Asparagus Fern
Light
low
Water
Dry
Temperature
0°F
100°F
Humidity
Low
med
Search by name
Add manually
Add new Plant
Picture
Name
Foo Foo
Type
Asparagus Fern
Location
Living room
Save
My Plants
Foo
Foo Foo
Asparagus Fern
Foo Bar
Bird's nest Fern
Bobby
Foo Orchid
My Plants
Alerts
Notifications
Today
All
Watered
Foo Foo
I need to be watered soon
Bobby
I'm really cold
Plant Alerts - All
Foo Foo
Needs water soon
Foo Bar
needs more light
Bobby
Needs to be warmer
All
Light
Water
Temp
Humidity
My Plants
Alerts

Design 3 (continued)