User Tasks and Testing

Group 7

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Setup and Setting Study Results

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Table of Contents

Introduction

This study intended to determine how effectively the SmartPonics application's design could guide users through the application and hardware setup process, check supply levels and manipulate settings. We conducted user testing between Nov 17 – Nov 19.

Our goals were to observe seamless navigation and setup by users with minimal confusion. We tested 10 participants. Our methodology was as follows:

We began the study by sending users a confirmation email that their SmartPonics account had been created and their apartment manager had assigned them three hydroponic boxes. This "Welcome" email set the context for the user, eliciting the expectation that they would be setting up the application during the test. We had users complete four tasks, described below, and took notes on whether their experience was as fluid as we hoped, noting where user doubt and misdirection occurred. We used the following rating system to gauge the scope of misguidance/error issues that prevented users from completing tasks unabridged:

> **Severity 1:** An issue that blocks a substantial number of users from using the application. E.g., Users are unable to navigate the app. Nearly impossible task during the initial experience.
> **Severity 2:** An issue that blocks a substantial number of users from making use of an important feature or accomplishing an important task. E.g., Unclear solution. Undiscoverable feature.
> **Severity 3:** An issue that hinders some users from accomplishing a task or goal. E.g., Inconsistent or misleading text. Users don't understand a non--essential aspect of the application or feature. Delays.
> **Severity 4:** An issue that causes some users to become mildly frustrated or express minor complaints about a feature element. E.g., Suggested Feature. Minor or infrequent complaint.

Key Findings
Severity 1
- After changing the nutrient mode, the participants didn't know whether the change had been saved successfully or not. (P7, P8, P9)
- Participants didn't understand the relationships between the "supplies" page and the "water/nutrients" page. (P7, P8, P9)

Severity 2
- When trying to change the nutrient mode, participants pressed the radio button for several times to get it selected. (P8, P9)
- When trying to change the nutrient mode, participant didn't click on the gear which represented setting, instead they tried pressing the "Normal" button to change the mode. (P8, P9)

- After pressing the notification, participants saw the Setting page, and then were confused over what to do. (P7, P9)
- Box 1,2,3 naming conventions were mildly confusing and criticized as generic. (P4, P5, P6)
- Participant didn't understand the Nutrient mode. (P4, P6, P8)
- Participant didn't understand the icons for "supplies" and "water/nutrients". (P4, P6, P9)

Severity 3
- Participants didn't understand the information offered on the weather page. (P8, P9)
- Participant didn't find where to change the nutrient mode. (P10)
- Participant thought the dashboard page was under the "Store" page. (P10)
- Participant was afraid of clicking the "Reset" button. (P5, P8)

Severity 4
- Participant didn't read the whole notification before clicking on it, and then was lost on the Setting page. (P9)
- Participant didn't find the keyword "weather" when asked to check the temperature and humidity. (P9)

Changes Made to Prototype
- Added "Done" button on the Nutrient Mode page
- Merged the "Supplies" with "Water/Nutrients"
- Changed "Water/Nutrients" to "Nutrients"
- Changed the location where shows the nutrient mode on the dashboard page
- Improving graphics
- Added the popup window on the dashboard page, showing the detail information of the notification
- Improved visual design
- Changed the icon for "Nutrients"
- Changed the tabs on the bottom toolbar
- Used "Weather" as the name of the weather button
- Added More page
- Added Me page
- Change the design layout of the top holding plate. Split that to small vial holding plates.

Changes Considered for Prototype
- Enlarge the clickable area of the radio button
- Iconize/Enable renaming Box 1,2,3

- Add explanation about the nutrient mode
- Adding explanation about each of the nutrients
- Introduce UV ray filter for reducing algae
- Reduce the information presented on the weather page
- Introduce Portability of the hardware
- Identify the materials to be used such that the weight of the hardware isn't too high.

Detailed Results

Table 1. The following are usability issues, sorted by Severity. Issues were derived from participant statements and direct observations.

Findings, Evidence, Recommendations, Fixes	Severity	UI Area
1. After changing the nutrient mode, the participants didn't know whether the change had been saved successfully or not. (P7, P8, P9)	1	Nutrient Mode page
Once the participants were asked to change the nutrient mode from "Normal" to "Fast Growth", they successfully found the setting button on the dashboard page and went to the setting page, and then they correctly clicked "Nutrient Mode" and then went to the nutrient mode page, then they clicked "Advanced" – "Fast Growth". Then they didn't know whether the change had be saved successfully or not, they hesitated for a few seconds and then clicked "Back" button, and then returned to the Setting page. They were getting more confused when seeing the setting page, then they click again on the "Nutrient Mode" and went to the "Nutrient Mode" page again, they lost. **Recommendation:** • Consider adding a "Done" button on the nutrient mode page. • Consider adding a notification when change saved.		
2. Participants didn't understand the relationships between the "Supplies" page and the "Water/nutrients" page. (P7, P8, P9)	1	Supplies page, Water/Nutrients page
Names like "Supplies" and "Nutrients" were confusing because they were interpreted synonymously. Participants were confused which to click when asked to check the nitrogen concentration. **Recommendation:**		

• Combine the "Supplies" and "Nutrients" page. • Consider renaming them.		
3. When trying to change the nutrient mode, participants pressed the radio button for several times to get it selected. (P8, P9)	2	Nutrient Mode page
Participants were trying to change the mode from "Normal" to "Advanced" by clicking on the radio button, but they failed several times, because the clickable area for this radio button was too small, and then was very hard to reach when using fingers to press the phone screen. **Recommendation:** • Consider enlarging the clickable area for these radio button.		
4. When trying to change the nutrient mode, participant didn't click on the gear which represented setting, instead they try to press the "Normal" to change the mode. (P8, P9)	2	Dashboard page
It seems quite obviously that participants thought that clicking on the specific word should also work when trying to change the nutrient mode, in this case "Normal". Because they tended to think that the word "Normal" and the Setting icon were a whole part. **Recommendation:** • Consider making the word "Normal" clickable. • Consider changing the position of the word "Normal" to separate it from the Setting icon.		
5. After pressing the notification, participants saw the Setting page, and then were confused what to do. (P7, P9)	2	Setting page
There were three clickable areas on the Setting page, the back button, the "Nutrient Mode", and the "Reset" button. The right action was to click on the "Reset" button and then reset to solve the problem, but the participants were: firstly confused and then clicked either the back button or the "Nutrient Mode". **Recommendation:** • Use popup window on the dashboard page to offer information and actions available.		
6. Box names 1,2,3 were confusing for navigation. (P4, P5, P6)	2	Nutrient Mode Window
Some users forgot which box to navigate back to. **Recommendation:**		

● Consider supporting renaming the boxes. ● Consider adding icons to further differentiate.		
7. Participant didn't understand the Nutrient mode. (P4, P6, P8)	2	Nutrient Mode page
Participant didn't understand "advanced" or "fast growth". **Recommendation:** ● Consider adding explanations to these nutrient modes.		
8. Participant didn't understand the icons for "Supplies" and "Water/nutrients". (P4, P6, P9)	2	Dashboard page
Participant can only use the words beneath the icons to navigate, the icons themselves were very confusing to the participant and offered no valuable information. **Recommendation:** ● Consider changing the icons for "Supplies" and "Water/Nutrients"		
9. Participants didn't understand the information offered on the weather page. (P8, P9)	3	Weather page
Now there was too much information on the Weather page, making participants confused. **Recommendation:** ● Reduced the information offered on the Weather page.		
10. Participant didn't find where to change the nutrient mode. (P10)	3	Dashboard page
Participant first clicked on the "Support" tab, and then tried to click on the "Water/Nutrients" icon, and then tried to click on the word "Normal", and then finally tried to click on the "Setting" icon. **Recommendation:** ● Consider making the word "Normal" clickable. ● Consider changing the position of the word "Normal" to separate it from the Setting icon.		
11. Participant thought the dashboard page was under the "Store" page. (P10)	3	Dashboard page

The information structure of the bottom toolbar was wrong. Now there were four tabs on the bottom toolbar, "Store", "Friends", "Support", "Account". But the dashboard page was not belonged to any of them. **Recommendation:** ● Change the tabs on the bottom toolbar, adding a "Home" tab, which the dashboard page belongs to.		
12. Participant was afraid to click the "Reset" button. (P5, P8)	3	Setting page
For this participant, the word "Reset" was connected to resetting system, which often lead to the loss of important information. For that reason, the participant was to some extent afraid to click the "Reset" button. **Recommendation:** ● Change the word "Reset". ● Explain the action of resetting and the possible consequences of the action.		
13. Participant didn't read the whole notification information before clicking on it, and then was lost on the Setting page. (P9)	4	Dashboard page
The participant was used to clicking on the notifications as soon as she saw them to dismiss them, usually some detail information would appear to guide her but not this time, so she was directed to the Setting page, and she didn't know what to do. **Recommendation:** ● Show detail information after users click on the notification. ● Only show the related available actions on the subsequence page.		
14. Participant didn't find the keyword "weather" when asked to check the temperature and humidity. (P9)	4	Dashboard page
The keyword "weather" was not shown on the dashboard page, instead the specific temperature was shown. This caused the participant to be confused. **Recommendation:** ● Adding the keyword "Weather" as the name of the weather button. ● Adding the specific temperature somewhere on or near the weather icon.		

Issues concerning Hardware

Severity 2
- Participant was unsure about the weight of the hardware and doubted whether user can lift the top glass large module all alone. (P2)

Severity 3
- Participant doubted the portability of the hardware between places. (P2, P3)

Severity 4
- Participant was unsure about the auto-cleaning cycle. (P1)

Changes Made to Hardware Prototype
- Change the design layout of the top holding plate. Split that to small vial holding plates.

Changes Considered to Hardware Prototype
- Introduce UV ray filter
- Reduce the information presented on the weather page
- Introduce Portability of the hardware
- Identify the materials to be used such that the weight of the hardware isn't too high.

Findings, Evidence, Recommendations, Fixes	Severity	UI Area
15. Participant doubted whether the glass top could be easily lifted considering its huge size (P2)	2	Hardware
We still did not finalize on the material of the glass top. We could not clearly answer the question. Even if we ignore the weight for a while, it is not easy to hold the glass top. **Recommendation:** ● Split the top glass to horizontal strips which can be easily moved from their place during maintenance.		
16. Participant doubted the portability of the hardware between places.	3	Hardware
We initially thought that the box could be lifted. But that is not a feasible solution. It could be heavy even without the water and refills. **Recommendation:**		

● Add-on wheels should solve the problem.		
17. Participant doubted the maintenance and cleaning of the water solution (P1)	4	Hardware
We initially believed a disposable layer will take care of cleaning the water solution. But the participant who is also expert suggested we can further increase the recycling cycle. **Recommendation:** ● Use UV ray filters to clean the water solution.		

Appendix 1: Participant Profiles

Tester	Familiarity with gardening	Apps/Devices generally used	Frequency of Use
1	Expert - Knows everything about the process	Hydroponics, Gardening	7-8 hours/day
2	Unfamiliar	Macbook, Harley Davidson Bike,	NA
3	Moderately familiar	Gardening tools	2 hours/week
4	Some - ornamental plants	Facebook, Reddit, Snapchat	7 hours/day
5	Little - never grown, but familiar with concepts	Facebook, OneBusAway, Spotify	4-5 hours/day
6	Some - had grown carrots for science project in school	Fitbit, Gmail, NPR, iMessage	5-10 hours/day
7	Little	Wechat	3 hours/day
8	Little	Wechat, Facebook	5 hours/day
9	Unfamiliar	Wechat,Facebook, Twitter	4 hours/day
10	Little	Wechat, Facebook	2 hours/day

Appendix 2: Task List

Task 1: Setup - Users received setup email with username and password info sent by the apartment manager from whom they rent the equipments. users were informed that they will receive an email, and instructed to follow its instructions. They were asked to imagine they have just signed up for SmartPonics through their apartment managers.
a. Open the setup email sent by the apartment manager
b. Enter email+pw into login page
c. See the box page

Task 2: Set Mode - Users were asked to setup Box 1's nutrient mode to Default mode. Once they set Box 1 to Default, they were asked to change the nutrient mode of Box 1 to Advanced mode and optimize for fast growth.
a. Set Box 1's nutrient mode to Default mode
b. Users are taken to Dashboard page
c. From Dashboard, users click Box 1 settings
d. Users are taken to B1 Settings page
e. Clicks nutrient mode
f. Change the nutrient mode from Default to Advanced mode + Fast Growth

Task 3: Check information- users were asked to check the information of Box 1
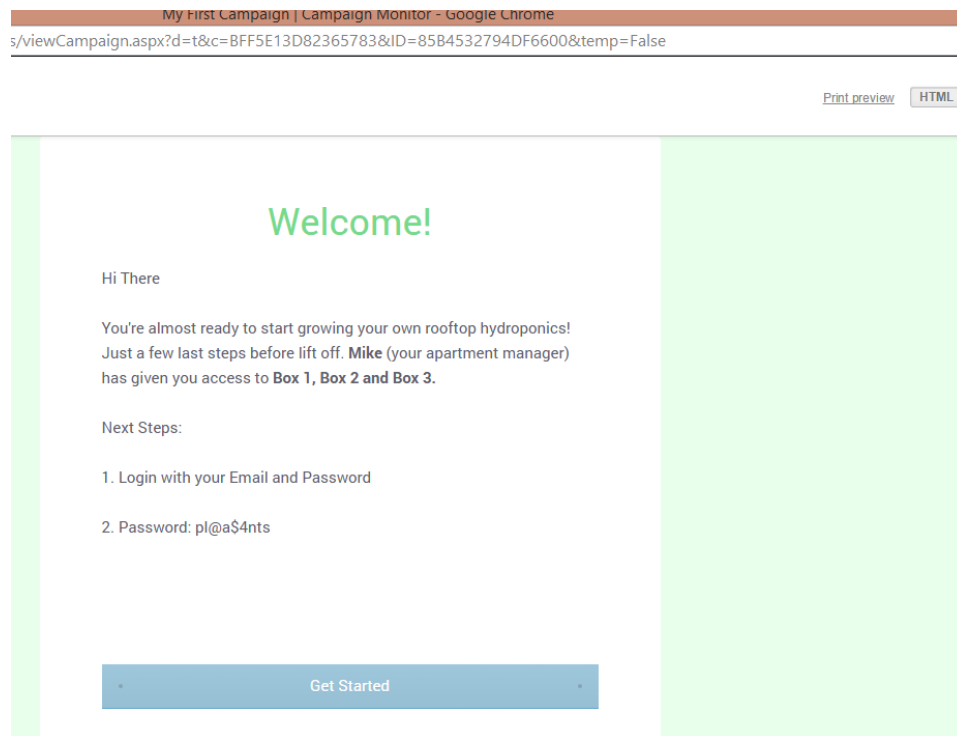a. check the humidity, temperature
b. check the current picture
c. check the usage of Nitrogen
d. check the current concentration of Nitrogen
e. navigate back to the dashboard page

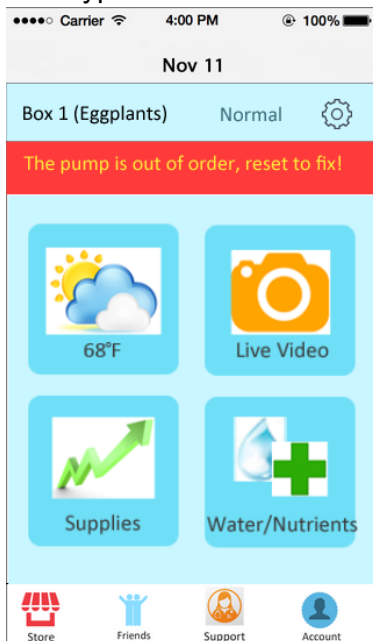**Task 4: System Reset - Users were told to deal with an abnormal situation shown on the Dashboard page.**
a. Click Settings icon or the notification
b. Users are taken to the B1 Settings page
c. Press Reset button
d. Press Reset in the popup window
e. Users are taken to Reset confirmation page, and wait
f. Users are taken back to the dashboard page and the problem will be solved
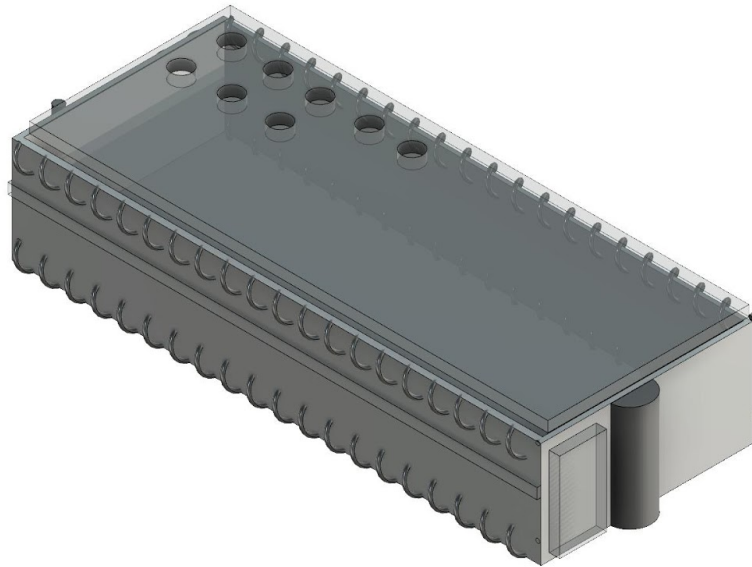
Appendix 3: Screenshots

Welcome Email

My First Campaign | Campaign Monitor - Google Chrome

s/viewCampaign.aspx?d=t&c=BFF5E13D82365783&ID=85B4532794DF6600&temp=False

Print preview   HTML

Welcome!

Hi There

You're almost ready to start growing your own rooftop hydroponics!
Just a few last steps before lift off. **Mike** (your apartment manager)
has given you access to **Box 1, Box 2 and Box 3.**

Next Steps:

1. Login with your Email and Password

2. Password: pl@a$4nts

Get Started

Prototype used for evaluation :http://lhytsi.axshare.com/#p=task_1

Prototype revised according to the evaluation findings: http://dlnbk7.axshare.com/#p=task_1
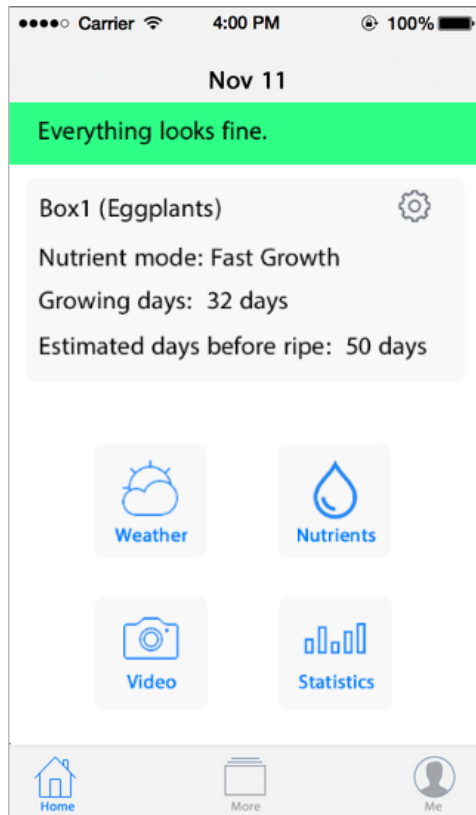
Prototype used for evaluation:

Prototype revised after evaluation:

Vial Holder

Collapsible container

Oxygen Pump

Electrical components
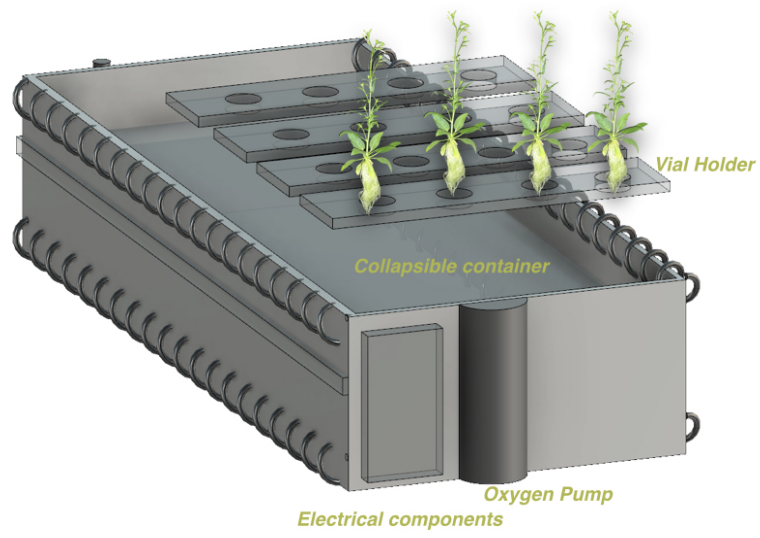
Prototype when closed for portability: