

Healthy Leaves

Sprint 1 Assignment

Presented to:

Professor Wahab Hamou-Lhaj

Daniel Savin	40010051
Karl Noory	40059592
Thomas Tran	40095654
Vicentiu-Cristian Badea	40027683
Jun Young Kim	40063176

Abstract - Owning houseplants has become a ubiquitous practice particularly for the millennial demographic. However, one of the problems that arises from this practice is poor handling of houseplants typically because of lack of knowledge and dedication. To further the dilemma of lack of knowledge, different plants require different care routines which may seem overwhelming for some who possess many houseplants.

To circumvent this common issue, we are developing an android application that will centralize all this data and have it readily available for houseplant owners. The application will be connected to a sensor via Wi-Fi that can measure the temperature, moisture, and light exposure of the specific plant. This information would then be sent to the user via notification on the application where it will then prompt the user into various activities (ex: watering, changing plant location, etc.) to reinvigorate the health of said plant.

Table of Contents

Table of Tables	2
1. Introduction.....	3
1.1 Product	3
1.2 Functionality.....	3
1.3 Benefits and Goals	3
1.4 Potential Users	3
1.5 Abbreviations & Definitions.....	3
3. Requirements.....	4
4. Sprint Backlog.....	6

Table of Tables

Table 1: Story Abbreviations.....	3
Table 2: Backlog Information.....	4
Table 3: Sprint 1.	6

1. Introduction

1.1 Product

An Android application that centralizes all relevant plant data collected from various sensors on a dashboard that allows users to better understand their plants. The product will have hardware and software components

1.2 Functionality

Collect information on plants and represent the data in an elegant fashion to the user where he can interact with it and learn about his plant needs.

1.3 Benefits and Goals

The benefits of owning our product is that users can optimize the time they spend with their plants by providing optimal care. The goal is to get more people interested in plant ownership by making it fun and easy for everyone.

1.4 Potential Users

The potential users are mainly millennials as they are more likely to be interested in house plant ownership. Additionally, any person who owns plants may be interested in our solution.

1.5 Abbreviations & Definitions

Table 1: Story Abbreviations.

SOFT	Software relating to Android application.
ELEC	Electrical hardware and systems.
COEN	Computer engineering, mix of hardware and software.

3. Requirements

Table 2: Backlog Information.

Story ID	Story Title	Card	Story Points	Sprint	Status	Conversation	Confirmation
ELEC-1	Power source	As a plant owner, I want to turn on or off the measuring system, so that I can choose when to use its battery	3	Sprint 1	Planned	To save power when the system is not needed, the user should have control on the system's state. For safety, the user should also turn the system off when working with the pot.	1. Can the user easily access a switch that turns on and off the system. 2. Can the user see the on/off state of the system visually
COEN-1	Read moisture	As a plant owner, I want to read data from the plant's environment moisture levels, so that I can keep track of my plants health	8	Sprint 1	Planned	Moisture in the soil can indicate the levels of water the plant is receiving. This information is a vital variable to control for a healthy plant.	1. Can the user read the real-time moisture levels of the soil through the android app 2. Can the user read the log of all previous moisture levels measured.
COEN-3	Read light	As a plant owner, I want to read data from the plant's environment light levels, so that I can keep track of my plants health	3	Sprint 2	Planned	Sunlight and artificial light are also a vital variable that needs to be controlled for a healthy plant.	1. Can the user read the real-time light levels of the soil through the android app 2. Can the user read the log of all previous light levels measured.
COEN-4	Read temperature	As a plant owner, I want to read data from the plant's ambient temperature levels, so I can keep track of my plants health	3	Sprint 2	Planned	The room temperature in which the plant is located in can affect its health too. Being able to read it will be helpful to keep it healthy. Plus it is a measurement that is easy to take.	1. Can the user read the real-time temperature levels of the soil through the android app 2. Can the user read the log of all previous temperature levels measured.
SOFT-1	Recommendations	As a plant owner, I want to receive recommendations on healthier practices for the plant, in order to maintain the plants health	3	Sprint 3	Planned	The user often doesn't know what he/she is doing wrong. Receiving personalized recommendations based on the measured data for better practices would improve the plants' health.	1. Can the user read a list of recommendations of healthier practices on his/her android application 2. Can the user get more information by being redirected detailed links
SOFT-2	Water notifications	As a plant owner, I want to receive notifications and alerts, so that I can be reminded to water my plant	5	Sprint 1	Planned	Plant care takers often forget to water their plants due to lack of habit. A daily or weekly reminder based on their type of plant would help them not forget. The amount of water their giving the plant should also be specified.	1. Can the user receive notifications to remind himself/herself to water his plants
SOFT-3	Light notifications	As a plant owner, I want to receive notifications and alerts, so that I can be reminded to keep my plant in a healthy ambient light environment	3	Sprint 2	Planned	The emplacement of a plant (such as near window) may give out too much or not enough light to a plant and will also change with seasons. Therefore, the plant owner should be notified when the location isn't adequate anymore.	1. Can the user receive notifications to let him/her know that the plant is not receiving enough light at its current location
SOFT-4	Temperature notifications	As a plant owner, I want to receive notifications and alerts, so that I can be reminded to keep my plant at a healthy temperature level	3	Sprint 2	Planned	Temperature levels can also change from a season to another and the user should be aware that these changes will affect his/her plants health. Whenever the temperatures reach unhealthy levels, the plant owner should be notified so he/she can turn up/down the thermostat	1. Can the user receive notifications to let him/her know that the room temperature is too low or high for the plant's health sake.
SOFT-8	Monitor growth	As a plant owner, I want to monitor the growth of my plant, so that I can know when to change its pot	3	Sprint 1	Planned	Many plant owners have this parenthood relationship with their plants and want to be able to monitor and log its growth. Plus, when a plant is too big for its pot, it should be switched into a bigger one. This monitoring can be done with a simple camera or even the android camera.	1. Can the user see a history of the plant's size 2. Can the user receive an alert when the plant's size has exceeded its pot size
SOFT-9	Identify plant	As a plant owner, I want to identify my plant and view information about it with a picture, so that I can understand it better	34	Future	Planned	Most of plant owners don't know the type of plant they own and therefore can't get the right information on its needs of sunlight, water, temperature, fertilizer, etc. With a plan identifier system, the right information can be updated and synced with the temperature, moisture and light levels recommended.	1. Can the user take a picture of the plant and know what type of plant they own. 2. Can the user associate that type to their profile and personalize the variables to this specific type of plant
ELEC-5	Durable case	As a plant owner, I want my product to be durable and low maintenance, so that I can use it for a long time	13	Sprint 3	Planned	Plant owners find it a hassle to take care of their plants and this product helps them with that. However, the system shouldn't add new problems with maintenance problems with the electronics. Plus, because the system is expensive, it should last for a long time. To solve these issues, the case should protect the system very well.	1. Can the user leave the pot unattended without the risk of breaking it with minimal force (such as a cat bumping it)
ELEC-6	PH check	As a plant owner, I want to verify the PH level of my plant, so that I can know if it is in a healthy environment	8	Future	Planned	The pH level is one of the most important factors in living organisms health. The soil should be at a healthy pH and well fertilized for a healthy plant. For data that helps in improving the plant's health, it will be important	1. Can the user read the real-time pH levels of the soil through the android app 2. Can the user read the log of all previous pH levels measured.

SOFT-10	Notification changes	As a plant owner, I want to be able to configure my notifications, so that I can change how often I am reminded to cater to my plant	3	Sprint 1	Planned	Plant owners have very varying and different preferences in notification frequency for information about their plants. Therefore, the android app should let them configure the frequency and what feature notification they want	1. The user can configure and choose what notifications to receive 2. The user receives notifications through the android system for the configuration chosen
SOFT-11	Add fertilizer	As a plant owner, I want to be reminded when to use fertilizer, so that I can keep the earth in my pot rich in nutrients for my plant	3	Future	Planned	Adding fertilizers doesn't have a fixed periodicity and therefore gets delayed or even forgotten often even though it is essential for the plant to get its nutrients. A scheduled reminder or using measurements should be used to notify the user to fertilize the soil.	1. The user can set an alarm for the future to remind himself/herself to fertilize the soil
SOFT-12	Database for plants	As a plant owner, I want access to a database of plants so that I can link mine and get specific information on how to cater to my plant	8	Future	Planned	The information about all the plants is very spread out through google and having one that is centralized in the app would be useful for the plant owner. If the type of plant is determined, the specific information of how to take care of that type of plant should be displayed.	1. The user can search on good practices for a specific type of plant through the android app
SOFT-13	Reminder for poison	As a plant owner, I want to be reminded to use poison when needed, so that bugs don't destroy my plants	5	Future	Planned	Often times, the users plants can have a bug infestation that eats at the leaves and roots of the plant. In order to avoid further damage to the plant, a reminder to apply poison to the plant would be necessary	1. Is the user reminded that they need to apply poison to the plant 2. Is the interval catered to the plant they own
SOFT-14	Reminder for leaves	As a plant owner, I want to be reminded to cut the leaves, so that my plant can remain proper and not affect their surroundings	3	Sprint 3	Planned	The leaves on plants grow as the plant grows and can cause a list of issues with the health of the plant, such as hiding sunlight exposure to the other leaves and causing them to dry off and die. Reminding the user to cut the leaves according to the profile of their plant will ensure that they don't forget cater to that aspect of their plant	1. Is the user reminded to cut the plants leaves 2. Is the interval at which the user cuts the leaves catered to the plant they own
ELEC-7	Pot minimalism	As a plant owner, I want the pot and sensors to occupy no more room than a normal pot would have taken.	13	Sprint 3	Planned	Space occupancy of a plant is sometimes an issue with plant owners, as they may purchase them for esthetic reasons. If the system occupies too much space, it may be a deal breaker	1. Do the pot and sensors occupy an equal amount of space or less than a normal pot
ELEC-8	Weather resistant	As a plant owner, I want to install the system in an outdoors environment and have the measuring system still functional.	5	Sprint 3	Planned	Many users seem to also grow their plants outdoors and use them for material use, such as growing vegetables or fruits. In order to cater to these plants as well, they should be able to have functional systems despite the harsher conditions	1. Can the system work outdoors
SOFT-15	Plant profile	As a plant owner, I want to enter the type of plant I own and have it saved onto my phone (to receive the adequate information about it if there's a database of plants).	5	Sprint 1	Planned	In order to have specific information on how to cater to the plant, there must be a database with preset information already available. From this database, important recommended intervals of watering the plant, as well as recommend light and temperature exposure should be suggested to the user by inputting the name of the plant into the system.	1. Can the user receive catered recommendations on treating the plant given it's own unique requirements

4. Sprint Backlog

The goal of Sprint 1 is to develop functional prototypes of various systems for integration in Sprint 2.

Table 3: Sprint 1.

Story ID	Task ID	Task Title	Task Description	Ideal Hours	Status	Comments
ELEC-1	ELEC-1.1	Connect power source	Connect a power source for arduino and sensors	5	Planned	
	ELEC-1.2	Wire a switch	Wire a switch that controls on/off state of system	5	Planned	
	ELEC-1.3	Connect a bulb	Connect a bulb that indicates whether or not the system is powered on/off	5	Planned	
COEN-1	COEN-1.1	Real-time moisture data	Display real-time data of the plant's environment moisture levels	5	Planned	
	COEN-1.7	Bluetooth connection to phone	Create a connection to the phone via bluetooth	5	Planned	
	COEN-1.8	Send moisture data	Send measured data to the phone via bluetooth in real-time	5	Planned	
	COEN-1.2	Log moisture data	Display a log of data of the plant's environment moisture levels	5	Planned	
	COEN-1.3	Graph moisture data	Display a graphical visualization of the plant's history of environment moisture levels	5	Planned	
	COEN-1.6	Filter moisture sensor data	Filter the data gathered through the moisture sensors to represent realistic accurate readings	5	Planned	
	COEN-1.4	Connect moisture sensor	Wire and connect hardware moisture sensors to the arduino	5	Planned	
	COEN-1.5	Convert moisture sensor data	Convert data gathered from moisture sensors to readable format	5	Planned	
SOFT-2	SOFT-2.1	Verify moisture data	Monitor incoming data from moisture sensor and verify for low values	5	Planned	
	SOFT-2.2	Low moisture notification	Send notification to user when value is too low	5	Planned	
SOFT-10	SOFT-10.1	Moisture notify interval	Create input time interval to change how often the notification is sent	5	Planned	
SOFT-15	SOFT-15.1	Plant database	Create database of plants with recommended watering interval, light exposure, temperature and growth	5	Planned	
	SOFT-15.2	Plant profile	Create plant profile containing name, recommended watering interval, light exposure and temperature and growth	5	Planned	
	SOFT-15.3	Display watering	Display recommended watering interval in plant profile	1	Planned	
	SOFT-15.4	Display light	Display recommended light exposure in plant profile	1	Planned	
	SOFT-15.5	Display temperature	Display recommended temperature in plant profile	1	Planned	
	SOFT-15.6	Display growth	Display recommended growth in plant profile	1	Planned	
	SOFT-15.7	Plant ListView	Create ListView of all plants with option to add new plant	5	Planned	
	SOFT-15.8	Plant choice drop-down	Create drop-down to show all plants in the database	5	Planned	
	SOFT-15.9	Recommended moisture notify	Compare input data from moisture sensor to retrieved plant recommendation and send notification if > chosen time past since last notification	5	Planned	
SOFT-8	SOFT-8.1	Plant growth	Determine the growth for all plants and correlate with pot sizes	5	Planned	