

# Software Project

**TEAM NAME: Greenly Pebble**

**PROJECT NAME: Smart Plant**



**Deo Anthony Madrid (N01361264)**

**Patrick Gomulka (N01347564)**

**Erni Banaag (N01221990)**

**Ricci Gamiao (N01363076)**



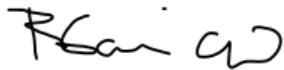

**Application Login Credential:**

**Email: [admin@admin.ca](mailto:admin@admin.ca)**

**Password: Admin#06**

**Or**

**Register your account**

Name	ID	Signature	Effort
Deo Anthony Madrid	N01361264		100%
Erni Banaag	N01221990		100%
Ricci Gamiao	N01363076		100%
Patrick Gomulka	N01347564		100%

### GitHub verified Link:

<https://github.com/riccigamiao3076/SmartPlant.git>

### THEME / BUSINESS GOAL:

- Develop an app that intertwines with hardware modules to collect sensor data for logging purposes.
- App is designed to track the health of the plant where it is enclosed together with the hardware sensors.

#### ● Epic #1

- Use a feedback page for new plants discovered.

#### ● Stories

- Create a community discussion about plants.
- Add plant photo sharing with friends.
- Automatic email surveys to clients.

#### ● Epic #2

- Create incentives for users for finding new plants.

#### ● Stories

- Create a badge achievement system.
- Offer premium features to clients.

- Create a contest program.

### **Additional features/functionality added since deliverable 1:**

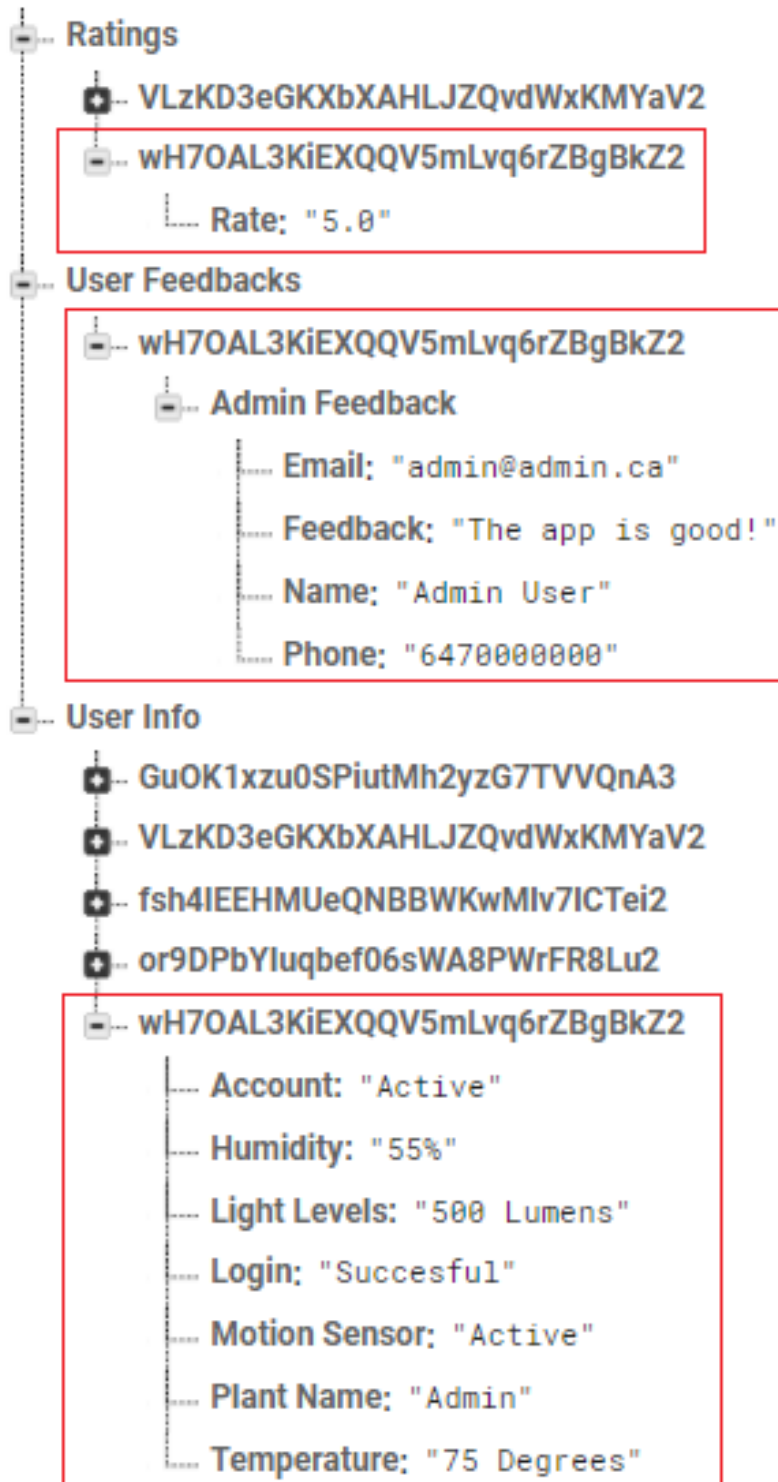
1. Added Login Feature.
2. Designed Home Screen, Dashboard, and Account Screen.
3. Added a simple Firebase Database.
4. Added Splash Screen.

### **Additional features/functionality added since deliverable 2:**

1. Remember me Checkbox.
2. Google Login.
3. Notification added.
4. Rating system.
5. User Registration
6. Feedback
7. Call/Email Service

## Firestore Database by Admin account, recorded by User ID

smart-plant-dcaaf-default-rtdb

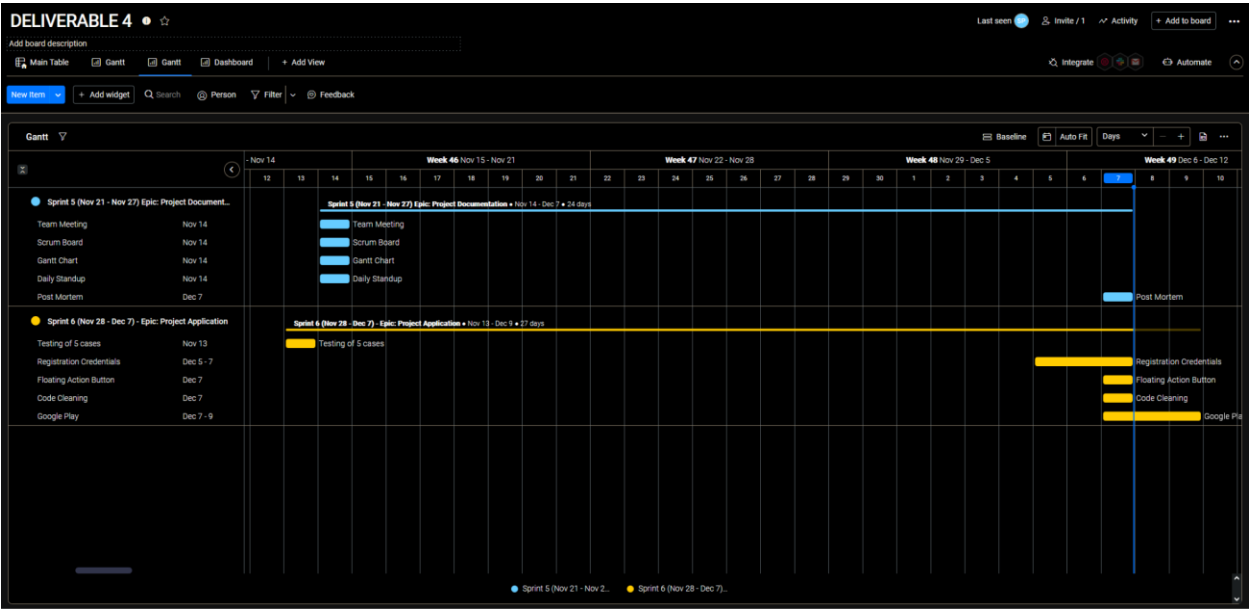


# Monday.com

Sprint 5 (Nov 21 - Nov 27) Epic: Project Documentation										
Team Meeting			Tasks		Status		Progress Tracking		Date	Timeline
			1		Done		100%		Dec 6	Nov 18
Subitems										
C4 Container Diagram	Assigned To	Workload	Status	Date Started	Date Completed	Comments				
	Patrick	Medium	Done	Sat, Nov 13	Tue, Dec 7					
+ Add Subitem										
Scrum Board										
			1		Done		100%		Nov 22	Nov 18
Subitems										
Monday.com	Assigned To	Workload	Status	Date Started	Date Completed	Comments				
	Deo	Easy	Done	Sat, Nov 13	Tue, Dec 7	Updating Sprints, Epics, and Tasks				
+ Add Subitem										
Gantt Chart										
			2		Working on it		0%		Nov 13	Nov 18
Subitems										
Main Milestones	Assigned To	Workload	Status	Date Started	Date Completed	Comments				
	Deo	Medium	Done	Wed, Dec 1	Tue, Dec 7					
Work Progress	Assigned To	Workload	Status	Date Started	Date Completed	Comments				
	Deo	Medium	Done	Wed, Dec 1	Tue, Dec 7					
+ Add Subitem										
Daily Standup										
			1		Done		100%		Nov 13	Nov 18
Subitems										
InVisionApp	Assigned To	Workload	Status	Date Started	Date Completed	Comments				
	Deo, Patrick	Easy	Done	Mon, Nov 22	Tue, Dec 7					
+ Add Subitem										
Post Mortem										
			1		Done		100%			
Subitems										
Document	Assigned To	Workload	Status	Date Started	Date Completed	Comments				
	Rico, Deo, Patrick, ...	Easy	Done	Mon, Nov 22	Sun, Dec 5					
+ Add Subitem										

Sprint 6 (Nov 28 - Dec 7) - Epic: Project Application										
Registration Credentials			Tasks		Status		Progress Tracking		Date	Timeline
			6		Done		100%		Nov 21	Nov 8 - 7
Subitems										
Full Name	Assigned To	Workload	Status	Date Started	Date Completed	Comments				
	Rico	Easy	Done	Mon, Nov 29	Tue, Dec 7					
Valid Email used as Username	Assigned To	Workload	Status	Date Started	Date Completed	Comments				
	Rico	Medium	Done	Mon, Nov 29	Tue, Dec 7					
Password	Assigned To	Workload	Status	Date Started	Date Completed	Comments				
	Rico	Medium	Done	Mon, Nov 29	Tue, Dec 7					
Phone Number	Assigned To	Workload	Status	Date Started	Date Completed	Comments				
	Rico	Easy	Done	Mon, Nov 29	Tue, Dec 7					
Hint	Assigned To	Workload	Status	Date Started	Date Completed	Comments				
	Rico	Easy	Done	Mon, Nov 29	Tue, Dec 7					
Regex validation	Assigned To	Workload	Status	Date Started	Date Completed	Comments				
	Rico	Medium	Done	Mon, Nov 29	Tue, Dec 7					
+ Add Subitem										
Floating Action Button										
			1		Done		100%			Dec 1
Testing of 5 cases										
			4		Working on it		0%		Nov 26	Nov 18
Subitems										
Just 4	Assigned To	Workload	Status	Date Started	Date Completed	Comments				
	Rico	Medium	Done	Tue, Dec 7	Tue, Dec 7					
Roberto	Assigned To	Workload	Status	Date Started	Date Completed	Comments				
		Hard	Stuck	Tue, Dec 7						
Espresso	Assigned To	Workload	Status	Date Started	Date Completed	Comments				
		Hard	Stuck	Tue, Dec 7						
Test Valid & Invalid	Assigned To	Workload	Status	Date Started	Date Completed	Comments				
		Hard	Stuck	Tue, Dec 7						
+ Add Subitem										
Code Cleaning										
			8		Done		100%			Dec 1
Subitems										
Removed Commented out code	Assigned To	Workload	Status	Date Started	Date Completed	Comments				
	Deo	Easy	Done	Tue, Dec 7	Tue, Dec 7					
Refactored App	Assigned To	Workload	Status	Date Started	Date Completed	Comments				
	Deo	Easy	Done	Tue, Dec 7	Tue, Dec 7					
Proper Formatting and Indentation	Assigned To	Workload	Status	Date Started	Date Completed	Comments				
	Deo	Easy	Done	Tue, Dec 7	Tue, Dec 7					
+ Add Subitem										
Google Play										
			1		Working on it		0%		Nov 28	Dec 1 - 9
Subitems										
App Verification	Assigned To	Workload	Status	Date Started	Date Completed	Comments				
	Emi	Medium	Working on it	Tue, Dec 7		Already submitted to Google Play for Validation, will take 2-3 days to complete				

# Gantt



# Google Play Store Submission:

Google Play Console

All apps

Dashboard

Inbox3

Statistics

Publishing overview

Release

Releases overview

Production

Testing

Reach and devices

Overview

Device catalog

App bundle explorer

Setup

Grow

Store presence

Main store listing

Custom store listings

Store listing experiments

Search Play Console

Create production release

Prepare

Review and release

Discard release

Errors, warnings and messages

1 Error

Show less

Error

You cannot publish applications until you complete ID verification. More details have been sent to your email.

1 Warning

Show less

1 MESSAGE FOR VERSION CODE 1

Warning

There is no deobfuscation file associated with this App Bundle. If you use obfuscated code (R8/proguard), uploading a deobfuscation file will make crashes and ANRs easier to analyze and debug. Using R8/proguard can help reduce app size. [Learn More](#)

New app bundles

File type	Version	API levels	Target SDK	Screen layouts	ABIs	Required features
App bundle	1 (1.0)	30+	30	4	All	1

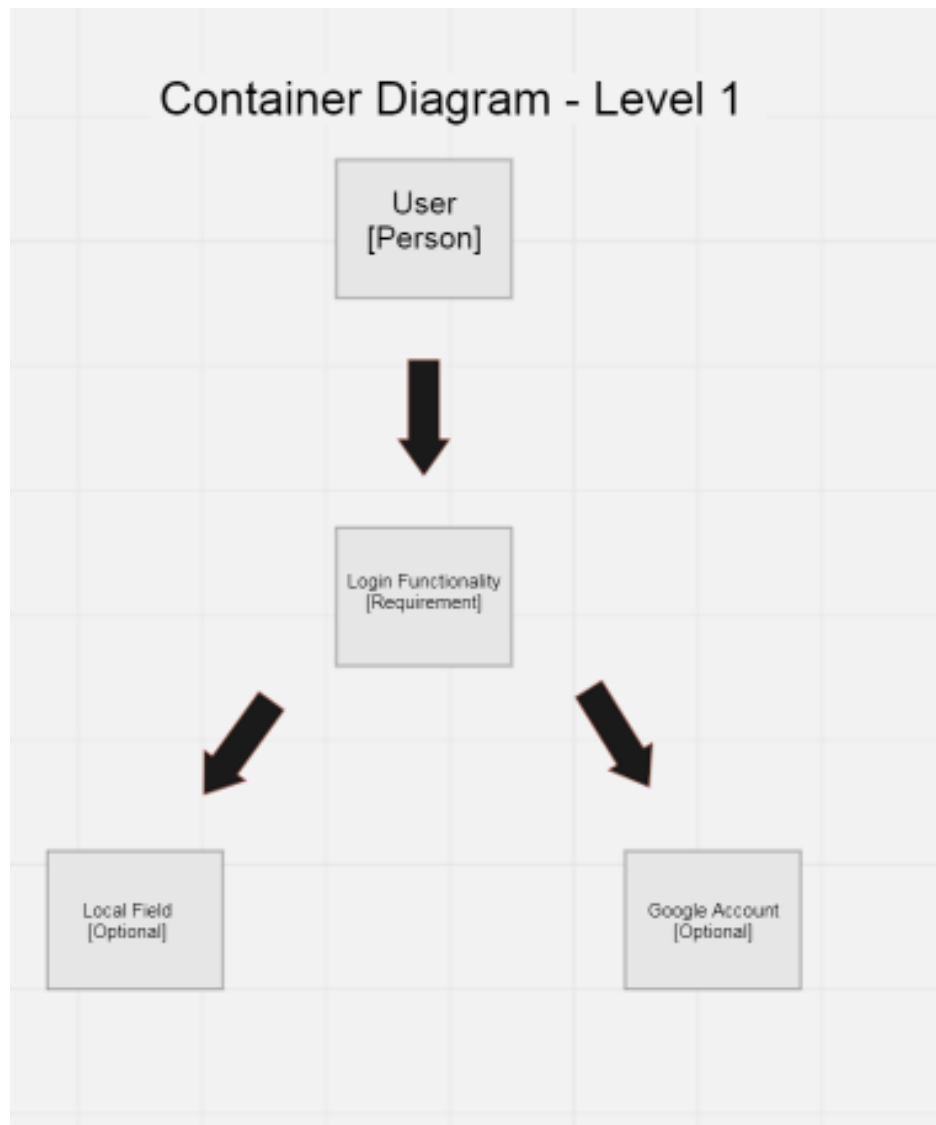
Release notes

1 Fix errors to rollout this release

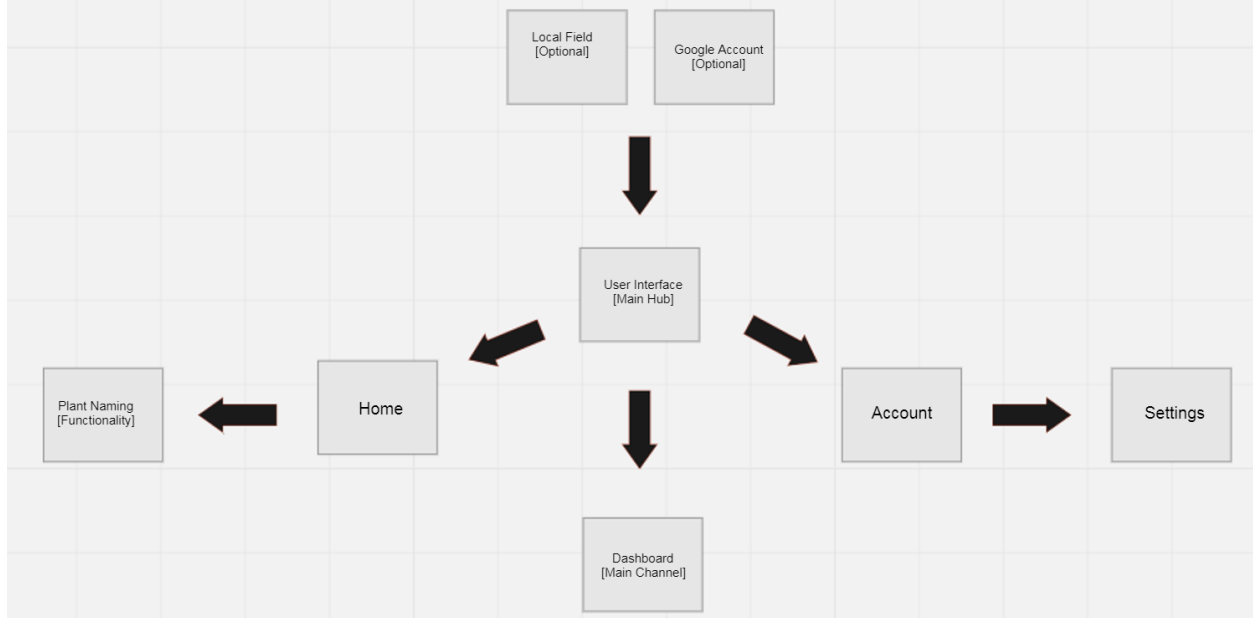
Fix errors to rollout this release

Start rollout to Production

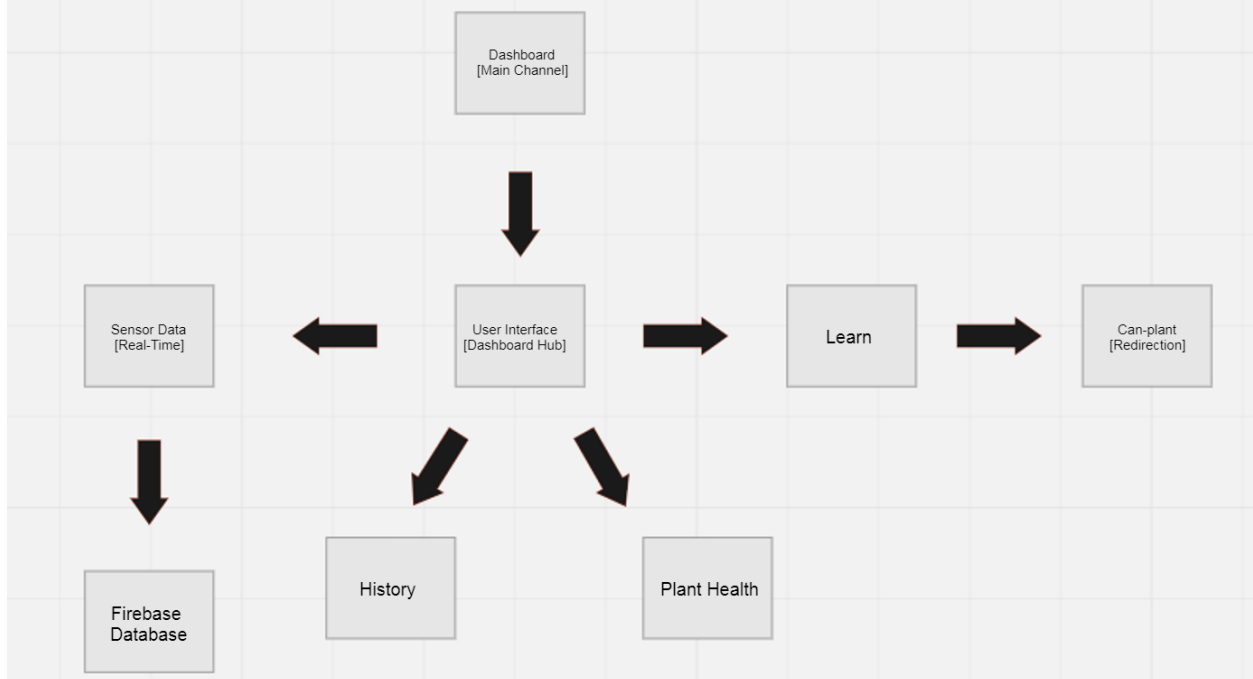
# C4 MODELS



## Container Diagram - Level 2



## Container Diagram - Level 3





## Post-Mortem, Project Review Meeting

Did the team members involved manage their time wisely?  
Or everything was done last minute.

We did group meeting and focused on documentation at Sprint 5.

Blockers why commits are last minute

Other  
labs/assignments

Work/chores

Time  
constraints

Were there issues with the quality or compromises along the way?

- App crashes, glitches, code problems, unorganized realtime database.
- Less group meetings due to blockers



We all attended the project review meeting

# Daily Standup

Sprint 5

November 22nd 2021

Erni Banaag	Ricci Gamiao	Patrick Gomulka	Deo Madrid
What did you work on yesterday? Group meeting	What did you work on yesterday? Group meeting	What did you work on yesterday? Group meeting	What did you work on yesterday? Group meeting
What will you work on today? Sensors Database	What will you work on today? App review, Registration	What will you work on today? Documentation	What will you work on today? Documentation
Any blockers? firebase acc	Any blockers? Chores	Any blockers? Doordash deliveries	Any blockers? Time Constraints

# Daily Standup

Sprint 5

November 26th 2021

Erni Banaag	Ricci Gamiao	Patrick Gomulka	Deo Madrid
What did you work on yesterday? Firebase Database	What did you work on yesterday? Documentation	What did you work on yesterday? Documentation	What did you work on yesterday? Documentation
What will you work on today? UI Design	What will you work on today? Registration screen	What will you work on today? Deliverable 3 bug fixes	What will you work on today? Application
Any blockers? suitable images	Any blockers? Chores, other labs	Any blockers? Scheduled shifts	Any blockers? Application Crashing

# Daily Standup

Sprint 6  
November 29th 2021

Erni Banaag	Ricci Gamiao	Patrick Gomulka	Deo Madrid
What did you work on yesterday? UI Design What will you work on today? FAB Buttons Any blockers? n/a	What did you work on yesterday? Deliverable 4 Review What will you work on today? Registration Screen, database Any blockers? Chores, other assignments, lack of time	What did you work on yesterday? C4 model What will you work on today? Designing health page Any blockers? Girlfriend	What did you work on yesterday? Application What will you work on today? Dashboard Any blockers? Gradle Script

# Daily Standup

Sprint 6  
December 5th 2021

Erni Banaag	Ricci Gamiao	Patrick Gomulka	Deo Madrid
What did you work on yesterday? FAB Buttons What will you work on today? History Page Any blockers? other courses work	What did you work on yesterday? Registration credentials What will you work on today? Registration credentials, feedback, rating, database Any blockers? Other assignments, lack of time	What did you work on yesterday? Designing health page What will you work on today? Implementing health page Any blockers? Conducting other assignments	What did you work on yesterday? Dashboard What will you work on today? Learn Page Any blockers? Internet Connectivity

# Daily Standup

Sprint 6  
December 7th 2021

Erni Banaag	Ricci Gamiao	Patrick Gomulka	Deo Madrid
What did you work on yesterday? History Page What will you work on today? Finalizing app Any blockers? n/a	What did you work on yesterday? Database organization What will you work on today? UI design, Test cases Any blockers? Exams, other labs	What did you work on yesterday? Designing health page What will you work on today? Final implementation Any blockers? Preparing for exam season	What did you work on yesterday? Learn Page What will you work on today? Review Any blockers? Exams

# Deliverable 3

## Stories and Task- Monday.com

DELIVERABLE 3

Last seen

Invite / 1

Activity

Add to board

Add board description

Main Table

Board

Dashboard

Add View

Integrate

Automate

New Item

Search

Person

Filter

Sort

Sprint 3 (Nov 1 - Nov 7) - Epic: Application Improvements

Tasks

Status

Progress Tracking

Date

Timeline

AsyncTasks

4

Working on it

0%

Nov 13

Nov 13

Subitems

Assigned To

Workload

Status

Date Started

Date Completed

Comments

Allow user to link to popular accounts (i.e. Gmail, Facebook, etc.)

Emi, Deo

Hard

Done

Sat, Nov 13

Sat, Nov 13

Google Sign in Works, but there are multiple setup procedures for it to work

Implement Remember Me checkbox

Emi

Hard

Done

Sat, Nov 13

Sat, Nov 13

Will Automatically remember email and password input when user signs out and al...

Store Data on Cloud for Assessment

Emi, Rioc

Hard

Done

Sat, Nov 13

Sat, Nov 13

Stores user login and registration info on firebase cloud database

Read Device Model Programmatically

Medium

HaveN't Started Yet

Sat, Nov 13

Sun, Nov 14

Add Subitem

Customer Review Screen

4

Working on it

0%

Nov 13

Subitems

Assigned To

Workload

Status

Date Started

Date Completed

Comments

Screen Template

Rioc

Easy

Done

Sat, Nov 13

Sun, Nov 14

Emoji or Stars Review

Rioc

Easy

Done

Sat, Nov 13

Sat, Nov 13

Star rating scale is nice, it also displays the rating in decimal.

User Contact Information Entry

Rioc

Easy

Done

Sat, Nov 13

Sun, Nov 14

Inputs are optional

Rate the App Button Functionality

Rioc

Easy

Done

Sat, Nov 13

Sun, Nov 14

Pop-up window is good, everything works

Add Subitem

Demonstration below of the following:

4

Done

100%

Nov 13

Subitems

Assigned To

Workload

Status

Date Started

Date Completed

Comments

AlertDialog

Emi, Patrick

Easy

Done

Sat, Oct 16

Tue, Oct 12

Close the App Dialog Box

Snackbar

Rioc, Deo

Easy

Done

Sat, Oct 16

Tue, Oct 12

Invalid Username or Password Dialog

Toast

Emi, Rioc

Easy

Done

Sat, Oct 16

Tue, Oct 12

Selecting Menu Item

Notification

Emi

Easy

Done

Sat, Nov 13

Sat, Nov 13

Smart Plant Light Notification

Add Subitem

Sprint 4 (Nov 8 - 14) Epic: Project Documentation

Tasks

Status

Progress Tracking

Date

Timeline

Scrum Board

1

Working on it

0%

Nov 13

Nov 14

Subitems

Assigned To

Workload

Status

Date Started

Date Completed

Comments

Monday.com

Deo

Easy

Almost Done

Sat, Nov 13

Updating Sprints, Epics, and Tasks

Add Subitem

Gantt Chart

2

HaveN't Started Yet

0%

Nov 13

Subitems

Assigned To

Workload

Status

Date Started

Date Completed

Comments

Main Milestones

Unknown

HaveN't Started Yet

Work Progress

Unknown

HaveN't Started Yet

Add Subitem

Daily Standup

1

Done

100%

Nov 13

Nov 14

Subitems

Assigned To

Workload

Status

Date Started

Date Completed

Comments

InvitationApp

Deo, Patrick

Easy

HaveN't Started Yet

Sat, Nov 13

Add Subitem

C4 Model

3

Done

100%

Nov 13

Nov 14

Subitems

Assigned To

Workload

Status

Date Started

Date Completed

Comments

System Context Diagram

Patrick

Medium

Working on it

Sat, Nov 13

2 Different Design Principles

Unknown

HaveN't Started Yet

2 Different Design Patterns

Unknown

HaveN't Started Yet

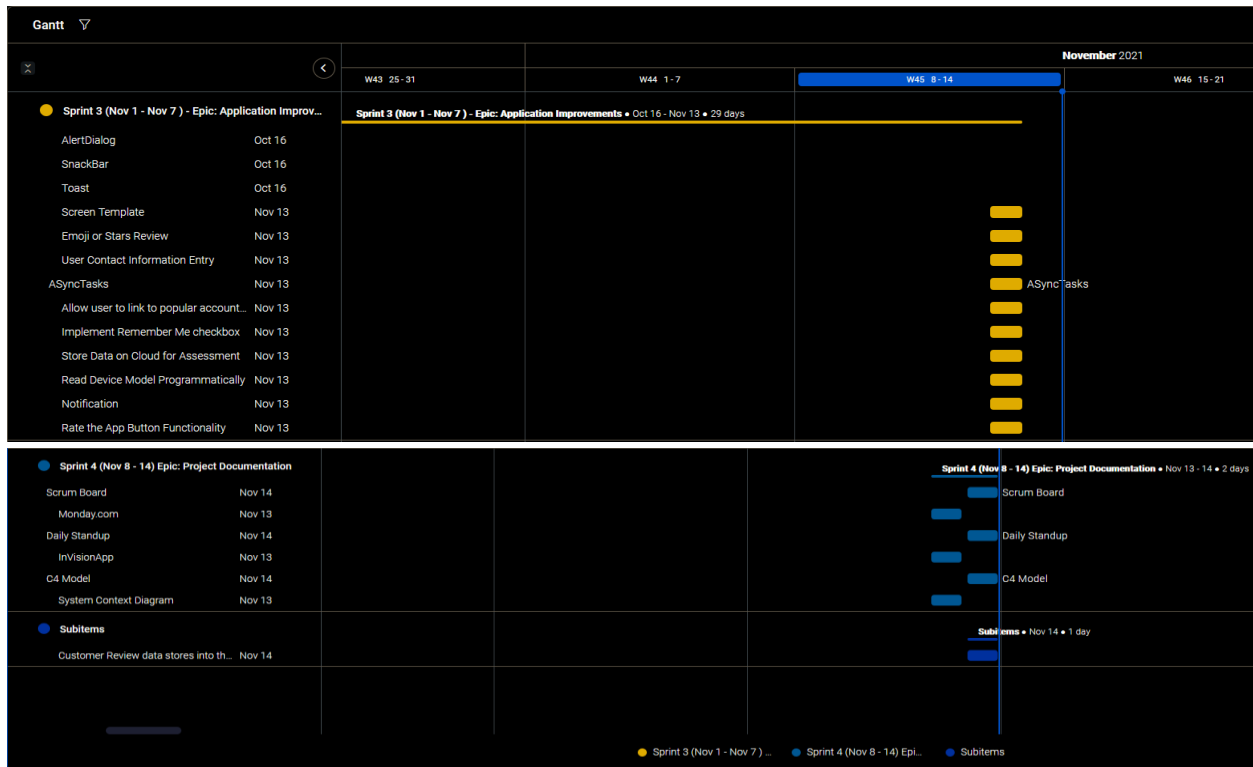
Add Subitem

Add

50%

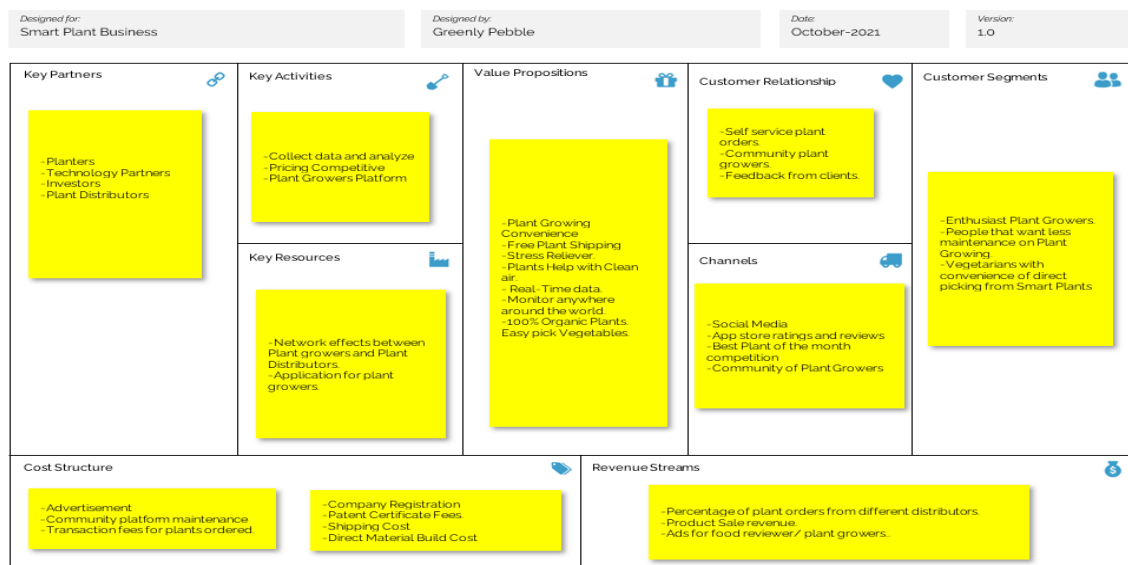
Nov 14

# Gantt Chart

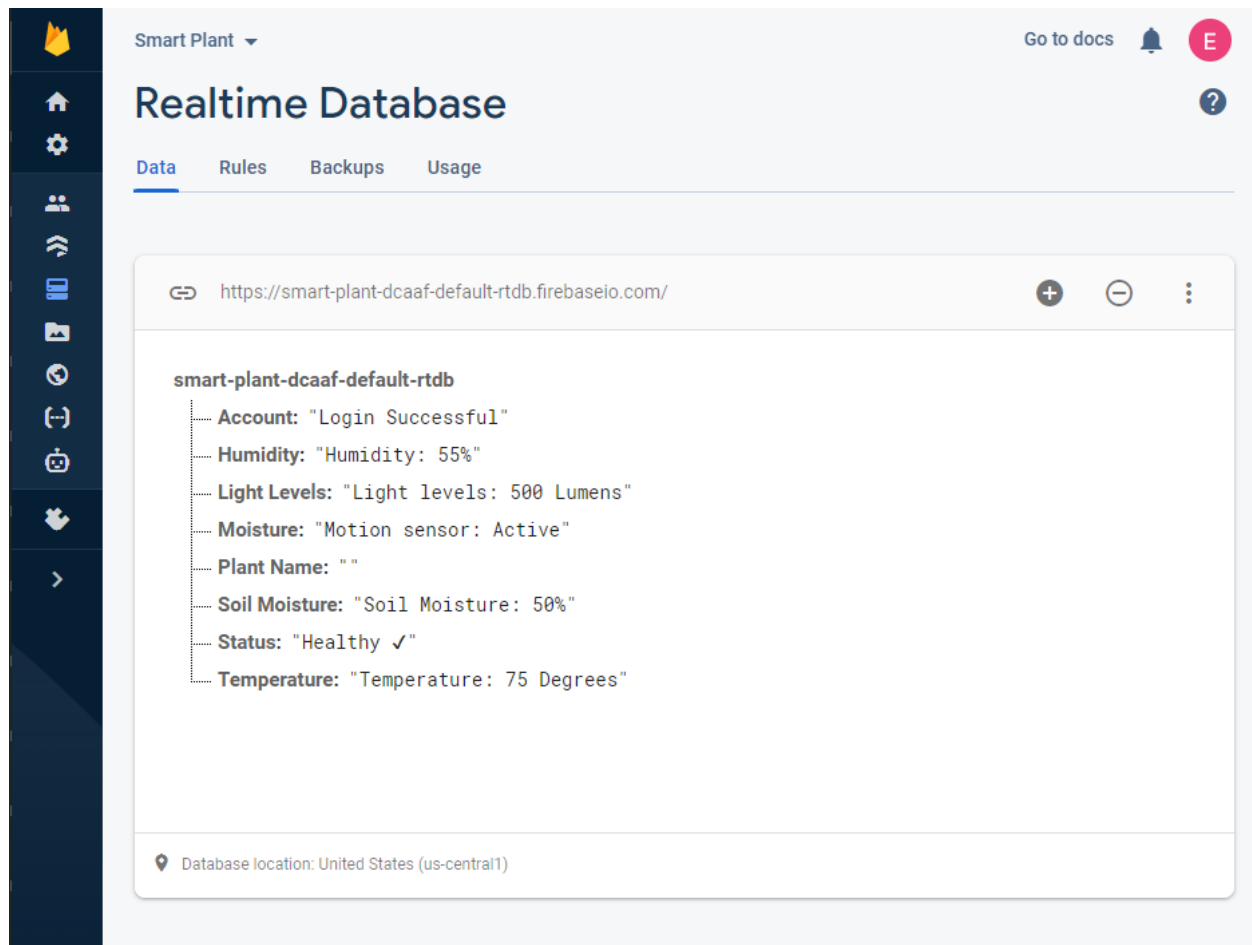


# Business Model Canvas

## Smart Plant Business Model



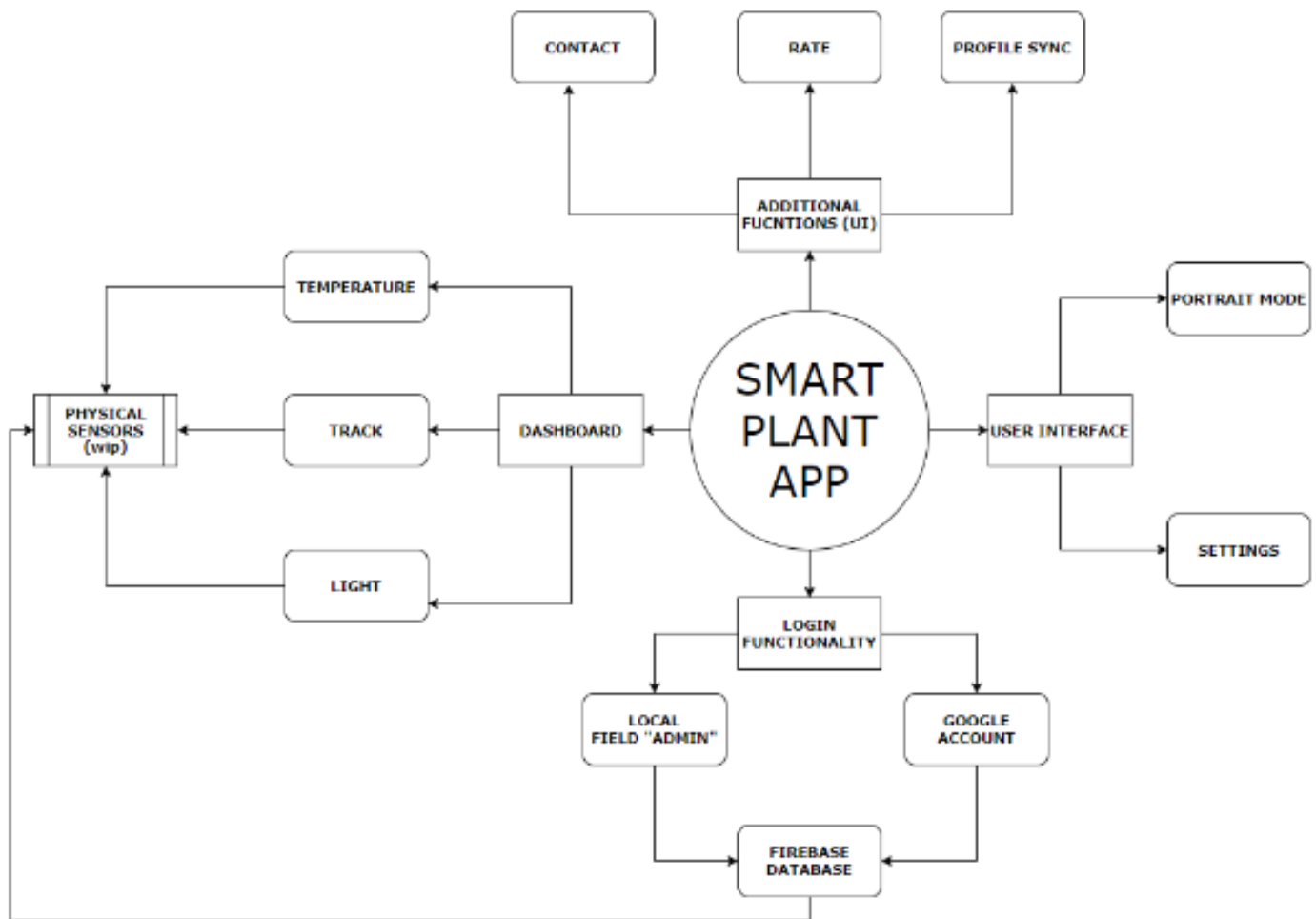
# Firestore Database



## Rating and Feedback in database

```
├── User Reviews
│   ├── "John Doe "
│   │   ├── Email: "johndoe@gmail.com"
│   │   ├── Feedback: "The new signing update is good! It made me acce..."
│   │   ├── Name: "John Doe "
│   │   ├── Phone: "6472616372 "
│   │   └── Rating: "5.0"
```

# C4 MODEL - System Context Design



# Deliverable 2

## GitHub Invitation:

The screenshot shows the GitHub repository settings for 'SmartPlant' (owner: riccigamiao3076). The 'Settings' tab is selected, and the 'Manage access' sub-tab is active. The 'Who has access' section shows that the repository is private and has 5 collaborators and 1 invitation. The 'Manage access' table lists the following collaborators:

Collaborator	Role	Status
austintian	Collaborator	Pending invite
ernigozebanaag1990	Collaborator	Active
Hak11	Collaborator	Active
DeoMadrid1264	Collaborator	Active
Patrick Gomulka	Collaborator	Active

## 5 Stories and 5 Task- Monday.com

The screenshot shows a Monday.com board for 'DELIVERABLE 2'. The board is organized into three sprints, each with a list of tasks and their status. The tasks are as follows:

Sprint	Task	Person	Status	Date
Sprint 1 (Oct 2 - 3) Login Page	Splash screen generated	Person 1	Done	Oct 2
	Remove navigation menu from login page	Person 2	Done	Oct 2
	Reorganize login page	Person 3	Done	Oct 2
	Reformat documentation	Person 4	Done	Oct 8
	Navigation menu added to 2 additional fragments	Person 5	Done	Oct 3
Sprint 2 (Oct 6 - 8) Fragment Organization	Activities reorganized	Person 6	Done	Oct 6
	Format hardcoded text to using values	Person 7	Done	Oct 6
	Add team names to github, as requested by professor	Person 8	Done	Oct 6
	Add non-functional settings/options page	Person 9	Done	Oct 7
	Add support for landscape lock functionality	Person 10	Done	Oct 8
Sprint 3 (Oct 9) Design Screen Pages	Design Home screen	Person 11	Done	Oct 9
	Design Dashboard screen	Person 12	Done	Oct 9
	Design Account screen	Person 13	Done	Oct 9
	Design Screen Splash	Person 14	Done	Oct 9
	Finalize Login screen	Person 15	Done	Oct 9



Sprint 4 (Oct 10-11): Advanced Functionality		Person	Status	Date
Add runtime permissions			Done	Oct 7
Add temporary validation to login page for testing purposes			Done	Oct 10
Add Portrait Lock Button			Done	Oct 10
Add success toast			Done	Oct 11
add Alert Dialog for incorrect credential			Done	Oct 11
+ Add Task				
Sprint 5 (Oct 12): Testing Phase		Person	Status	Date
Test Portrait Mode / Landscape Mode			Done	Oct 12
Test Login			Done	Oct 12
Test Runtime Camera			Done	Oct 12
Test Buttons			Done	Oct 12
Test splash screen			Done	Oct 12
+ Add Task				

## Additional features/functionality added since deliverable 1:

1. Added Login Feature.
2. Designed Home Screen, Dashboard, and Account Screen.
3. Added a simple Firebase Database.
4. Added Splash Screen.

Daily Stand Up:	Date:
Deliverable 1 fixed/updated	10/02/21
Splash screen layout	10/04/21
Fragments reorganized	10/06/21
Readme.md updated	10/08/21
String values, app visuals updated	10/10/21
Homescreen + Gradle version updated	10/11/21
Firebase database added	10/12/21

# Deliverable 1

## Table of Contents:

<b>Team Contract:</b>	18
<b>Github Repo Link: <a href="https://github.com/riccigamiao3076/SmartPlant">https://github.com/riccigamiao3076/SmartPlant</a></b>	25
<b>Invitation Screenshot:</b>	25
<b>Project Background and Description:</b>	25
Project Goals and Vision:	25
Software aspect and hardware:	25
Screen Flows:	26
Feedback Incorporation:	26
Plans for Database:	26
<b>Project Scope:</b>	26
<b>Theme and Epics:</b>	27
Theme:	27
Epic #1	27
Stories	27
Epic #2	27
Stories	28
<b>TASKS:</b>	28
Use Case:	28
Features:	28
<b>MATERIALS:</b>	29
Graphical User Interface:	30
Database:	30

# Team Contract

## CENG-322 TEAM PROJECT

**Team Name: GREENLY PEBBLE**

**Project Name: SMART PLANT**


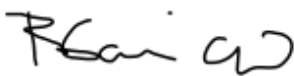
---

*Please negotiate, sign, scan and include as the first section in your Deliverable 1.*

Please note that if cheating is discovered in a group assignment each member will be charged with a cheating offense regardless of their involvement in the offense. Each member will receive the appropriate sanction based on their individual academic honesty history.

Please ensure that you understand the importance of academic honesty. Each member of the group is responsible to ensure the academic integrity of all of the submitted work, not just their own part. Placing your name on a submission indicates that you take responsibility for its content.

Team Member Names (Please Print)	Signatures	Student ID
Project Leader:  Deo Anthony Madrid		N01361264
  Patrick Gomulka		N01347564

Erni Goze Banaag		N01221990
Ricci Gamiao		N01363076

For further information read Academic Honesty Policy on <https://humber.ca/legal-and-risk-management/policies/search-by-students.html>.

By signing this contract, we acknowledge having read the Humber Academic Honesty Policy as per the link below.

<https://academic-regulations.humber.ca/2018-2019/17.0-ACADEMIC-MISCONDUCT>

### Responsibilities of the Project Leader include:

- Assigning tasks to other team members, including self, in a fair and equitable manner.
- Ensuring work is completed with accuracy, completeness and timeliness.
- Planning for task completion to ensure timelines are met
- Any other duties as deemed necessary for project completion

### What we will do if . . .

Scenario	Accepted initials	We agree to do the following
Team member does not deliver component on time due to severe illness or extreme personal problem	E.B D.M P.G R.G	a) Team absorbs workload temporarily ____  b) Team seeks advice from professor ____  c) Team shifts target date if possible ____  d) Other:

Scenario	Accepted initials	We agree to do the following
Team member cannot deliver component on time due to lack of ability	E.B D.M P.G R.G	a) Team reassigns component ____ b) Team helps member ____ c) Team member must ask professor for reference material ____ d) Other:
Team member does not deliver component on time due to lack of effort	E.B D.M P.G R.G	a) Team absorbs workload ____ b) Team "fires" team member by not permitting his/her name on submission ____ c) Other:
Team member does not attend team meeting	E.B D.M P.G R.G	a) Team proceeds without him/her and will assign work to the absent member ____ b) Team doesn't proceed and records team member's absence ____

Scenario	Accepted initials	We agree to do the following
		c) Team proceeds for that meeting but "fires" member after __ occurrences __
An unforeseen constraint occurs after the deliverable has been allocated and scheduled (a surprise test or assignment)	E.B D.M P.G R.G	a) Team meets and reschedules deliverable __ b) Team will cope with constraint __ c) Other:
Team cannot achieve consensus leaving one member feeling "railroaded", "ignored", or "frustrated" with a decision which affects all parties	E.B D.M P.G R.G	a) Team agrees to abide by majority vote __ b) Team flips coin __ c) Other:
Team members do not share expectations for grade desired	E.B D.M P.G R.G	a) Team will elect one person as "standards-bearer" who has the right to ask that work be redone __ b) Team votes on each submission's quality __ c) Team will ask for individual marking and will identify sections by author __ d) Other:

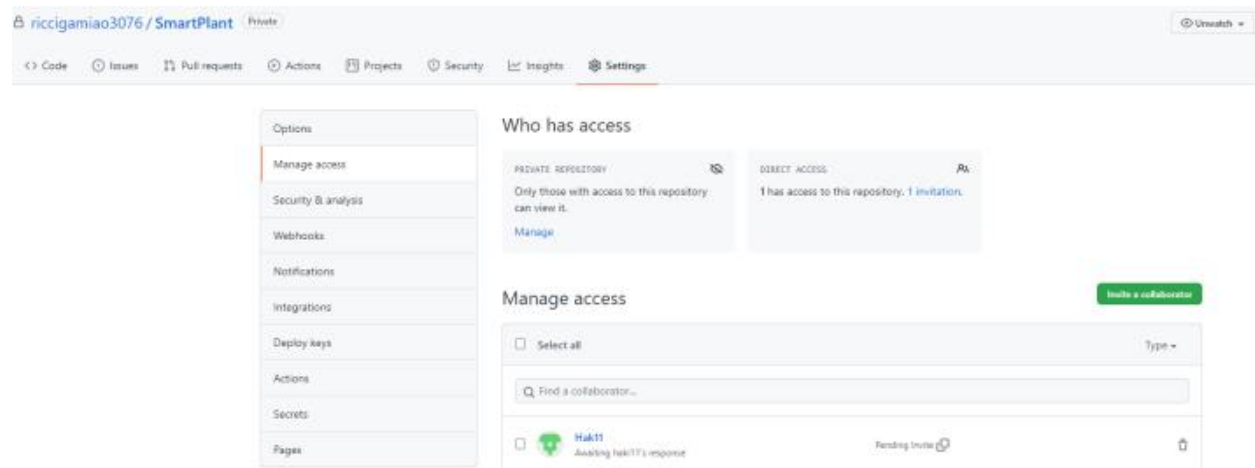
Scenario	Accepted initials	We agree to do the following
Team member behaves in an unprofessional manner by being rude or uncooperative	E.B D.M P.G R.G	a) Team attempts to resolve the issue by airing the problem at team meeting ____  b) Team requests meeting with professor to problem-solve ____  c) Team ignores <del>behaviour</del> ____  d) Team agrees to avoid use of all vocabulary inappropriate to the business setting ____
Team member assumes or requests that his/her name be signed to a submission but has not participated in production of the deliverable	E.B D.M P.G R.G	a) Team agrees that this is cheating and is unethical ____  b) Friends are friends and should help each other ____  c) Team will submit with signature but will advise professor who will take action ____
There is a dominant team member who is content to make all decisions on the team's behalf leaving some team members feeling like subordinates rather than equal members	E.B D.M P.G R.G	a) Team will actively solicit consensus on all decisions which affect project direction by asking for each member's decision and vote ____  b) Team will express subordination feelings and attempt to resolve issue ____

Scenario	Accepted initials	We agree to do the following
		c) Other:
Team has a member who refuses to participate in decision making but complains to others that s/he wasn't consulted	E.B D.M P.G R.G	a) Team forces decision sharing by routinely voting on all issues ____ b) Team routinely checks with each other about perceived roles ____ c) Team discusses the matter at team meeting ____



**GitHub Repo Link:** <https://github.com/riccigamiao3076/SmartPlant>

## Invitation Screenshot:



## Project Background and Description:

### 1. Project Goals and Vision:

This Capstone Project envisions the automation of planting using technology. The Smart Plant helps plant growers track and monitor their plants daily and provides an efficient system for plants to grow and sustain the healthy plant. Using sensors such as Temperature, Humidity, soil moisture, and light, to allow users to maintain the health of the plant through an application, providing notifications for health updates or maintenance requirements.

### 2. Software aspect and hardware:

The software aspect of the project will use an android based app development, primarily using software tools such as AndroidStudio, and GitHub. The hardware will implement multiple sensors such as temperature, humidity, soil moisture, and light. We will also use water pumps, tubing, and a 4-channel relay board, to connect

everything together to ensure every component is working in tandem with one another.

### **3. Screen Flows:**

User's will be able to navigate the application with ease, as we will be using a bottom navigation design layout. When opening the application the user will see the temperature, humidity, soil water measurement, and sunlight lumens measurement. In the middle of the screen there will be multiple types of plants to select and configure for maintenance.

### **4. Feedback Incorporation:**

With the feedback requiring options Login and Registration we will incorporate this with our application using Firebase Realtime Database. Including different plant options for different specification maintenance needs.

### **5. Plans for Database:**

We will implement Firebase Realtime Database for User login and Plant data statistics.

## **Project Scope:**

The scope of the project will take around 2-3 months for the estimated completion, however depending on the upcoming demands and evaluations from other classes, we might need extra time depending on how it goes.

We will get all of our required materials first, and then start planning the individual tasks to be evenly distributed to our team members in both software and hardware fields, and schedule regular in person meetings to discuss and work on the project.

If any technical challenges arise that jeopardize our projected completion date, we will reduce the length of our development phase by undertaking an improvised redesign of our product, and simplifying the user interface if needed.

We will know when our project is complete, when we can verify the functionalities of our product, including both software and hardware requirements are met. The requirements include Sensor's data presented on the main screen, Selection of plants varying different maintenance requirements, Plant logs data used and presented via graph, and Login and Registration database / page.

## Theme and Epics:

- **Theme:**

- Increase Plant Database

- **Epic #1**

- Use a feedback page for new plants discovered.

- **Stories**

- Create a community discussion about plants.
  - Add plant photo sharing with friends.
  - Automatic email surveys to clients.

- **Epic #2**

- Create incentives to users for finding new plants.

- **Stories**

- Create a badge achievement system.
- Offer premium features to clients.
- Create a contest program.

## TASKS:

(1) HARDWARE: Design PCB

(2) HARDWARE: Set up motor, sensors, battery and other IOT devices.

(3) SOFTWARE: Extract sensor data

(4) SOFTWARE: Link app to PCB

**Hardware** - Erni & Deo

**Software** - Ricci & Patrick

## Use Case:

- **Automated plant gardening system**
- **Self Sufficient plant maintenance**
- **Efficient Plant Grower**

Features:

- **Self-monitoring unit for plant health abnormalities**
- **Response mechanism to plant health irregularities**
- **Instant alert to mobile device**
- **Real-time measurement data (Temp, Humidity, Soil Moisture.)**
- **Automated Plant Water Scheduling**
- **Plant status animation**

## **MATERIALS:**

- Raspberry Pi 4 ✓ (We all should have one)
- Arduino Uno ✓ (We all should have one)
- Temperature Sensor ✗  
[https://www.amazon.ca/AM2302-Digital-Temperature-Humidity-Connecting/dp/B01DB8JH4M/ref=sr\\_1\\_39?dchild=1&keywords=DHT22&qid=1632605111&sr=8-39](https://www.amazon.ca/AM2302-Digital-Temperature-Humidity-Connecting/dp/B01DB8JH4M/ref=sr_1_39?dchild=1&keywords=DHT22&qid=1632605111&sr=8-39) \$9.32
- Humidity Sensor ✗ (Will buy them separately)
- Light Sensor ✗  
[https://www.amazon.ca/Partstower-GY-302-BH1750FVI-Intensity-arduino/dp/B01FVX1NHY/ref=sr\\_1\\_10?dchild=1&keywords=bh1750+light+lux+sensor&qid=1632602149&sr=8-10](https://www.amazon.ca/Partstower-GY-302-BH1750FVI-Intensity-arduino/dp/B01FVX1NHY/ref=sr_1_10?dchild=1&keywords=bh1750+light+lux+sensor&qid=1632602149&sr=8-10) \$12.99
- Water Pump ✗
- Water Tubing ✗
- IOT soil moisture sensor ✗
- 4-Channel Relay Board ✗ (Above 4 will be included in kit below)  
[WayinTop Upgrade Automatic Irrigation DIY Kit Self Watering System for Garden Plant, Development Board + 4pcs Soil Moisture Sensor + 4 Channel Relay + 4pcs Water Pump + 5M Vinyl Tubing + Jumper Wire: Amazon.ca: Patio, Lawn & Garden](#) \$41.99
- Plant/Device enclosure ✗
- Battery Power / Solar ✗
- Water Supply Storage ✗
- ESP8266 / Blue Pill for Real-Time system Data ✗  
[Yizhet ESP8266 ESP-12E Serial WiFi Module NodeMcu Lua WiFi V3 Internet of Things Development CH340 \(3 pcs\) : Amazon.ca: Electronics](#) \$18.99
- Motion Sensor ✓ (Erni has one)

[Aukru HC-SR501 Human Body Pyroelectricity Infrared PIR Motion Detector Sensor Module for Arduino, Raspberry Pi and Microcontrollers Electronic Projects : Amazon.ca: Electronics](#) \$6.99

- LCD Screen ✕ (Optional)

[WayinTop 20x4 2004 LCD Display Module with IIC/I2C/TWI Serial Interface Adapter for Arduino for Mega 2560 \(Blue/2004\) : Amazon.ca: Electronics](#) \$12.99

## Graphical User Interface:

- Temperature, Soil Moisture, and Humidity Data.
- Water Scheduler.
- Different Plant Selection.
- Logging Sensor Data.
- Plant Health Status Animation.

## Database:

User Login, Registration Page, Password Reset.

- Plant Database, (Water, Soil, Temperature Requirements).