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Home



Welcome to your new space!

Confluence spaces are great for sharing content and news with your team. This is your home page. Right now it shows recent space activity, but you can customize this page in any way you like.

Complete these tasks to get started

- Edit this home page** - Click *Edit* in the top right of this screen to customize your Space home page
- Create your first page** - Click the *Create* button in the header to get started
- Brand your Space** - Click *Configure Sidebar* in the left panel to update space details and logo
- Set permissions** - Click *Space Tools* in the left sidebar to update permissions and give others access

Recent space activity



Yilin Liu

Project Progress 1 •

Date 14/09/2023 2 •

Date 31/08/2023 2 •

Date 03/09/2023 3 •



Yunqing Yu

Date 14/09/2023 4 •

Space contributors

- [Yilin Liu](#) (1)
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- ...

AquaTerra Project Home Page



Project Objectives

Aquatera, an organization specializing in simplifying and cost-effective online farming solutions utilizing parameters such as soil moisture and temperature, currently operates a web platform developed on AWS cloud services and a PostgreSQL backend. The platform facilitates user access to crucial moisture data across different sections of their fields.

The current focus involves developing a mobile application to optimize customer data presentation. This strategic move aims to elevate customer satisfaction and extend the company's market reach. The organization's proficient IT team will provide guidance to the team, encouraging them to leverage their creativity and innovation in designing the application.

Source: https://canvas.lms.unimelb.edu.au/courses/156871/pages/aquaterra-code-aq?module_item_id=4949498

Our Jira Board Link

<https://aqreadback.atlassian.net/jira/software/projects/KAN/boards/1/timeline>

Our Git Hub Link

<https://github.com/COMP90082-2023-SM2/AQ-Redback>

Our Team

Name	Role	Responsibilities and Regular Activities	Email
	Product Owner	<ul style="list-style-type: none"><input checked="" type="checkbox"/> Reassess the product backlog of development tasks and adjust priorities as needed.<input checked="" type="checkbox"/> Maintain constant accessibility during development to address team members' inquiries and prevent misunderstandings.<input checked="" type="checkbox"/> Establish clear sprint objectives and goals.<input checked="" type="checkbox"/> Monitor updates, feedback, and inquiries from clients.	yunqingy@student.unimelb.edu.au

 <p>Yilin Liu</p>	Scrum Master	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Ensure timely delivery of planned features within each sprint. <input checked="" type="checkbox"/> Conduct and coordinate standup meetings and other Scrum ceremonies. <input checked="" type="checkbox"/> Regularly oversee the Kanban board and allocate tasks to team members. <input checked="" type="checkbox"/> Maintain vigilance over project updates and progress, offering proactive feedback. 	yilliu3@student.unimelb.edu.au
 <p>Bowei Huang</p>	Dev Lead	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Engage in routine standup meetings, providing updates on ongoing development progress and sharing feedback. <input checked="" type="checkbox"/> Collaboratively address bugs and defects in the code, working together to find effective solutions. <input checked="" type="checkbox"/> Regularly monitor the Kanban board to stay informed about new changes and updates. 	boweih@student.unimelb.edu.au
 <p>You Zhou</p>	Dev Member	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Engage in routine standup meetings, providing updates on ongoing development progress and sharing feedback. <input checked="" type="checkbox"/> Collaboratively address bugs and defects in the code, working together to find effective solutions. <input checked="" type="checkbox"/> Regularly monitor the Kanban board to stay informed about new changes and updates. 	yozhou1@student.unimelb.edu.au
 <p>Jiakang Li</p>	Quality Manager	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Monitoring and inspecting our mobile application to identify deviations from quality standards and taking corrective actions when necessary. <input checked="" type="checkbox"/> Identifying potential quality risks and implementing measures to mitigate them. 	jiakangl@student.unimelb.edu.au

Our Stakeholders

Client (AquaTerra Group)	Lokesh Chandra	lokesh.spark.1651@gmail.com
IT Support (AquaTerra Group)	Sean Wei	sean.wei@unimelb.edu.au
Supervisor	Wei Wang	wang.w11@unimelb.edu.au

Communication Plan

Owner	Meeting Title	Audience	Objective	Frequency	Format (virtual /face to face)
Scrum Master	Project status report	Product Owner	Review the project's current status and discuss the potential issues.	Weekly	Virtual (Slack or Zoom)
Product Owner	Report progress to stakeholders	Project stakeholders	Report progress of the project to stakeholders and get feedback from them.	Weekly	Virtual (Slack or Zoom)

Scrum Master & Product Owner	Stand-up Meeting	Dev Team	Discuss the progress of the task and check if any resources are needed for development.	Twice a week	Virtual (Zoom)
Team	Clarify requirements	Client	Clarify requirements and resolve doubts	1-2 times per sprint	Virtual (Zoom)
Scrum Master	Sprint planning ceremony	Dev Team	Discuss the goals and requirements for the project and generally identify the goals for each sprint	Beginning of sprint	Virtual (Zoom)
Scrum Master	Sprint Review	Dev Team	Review what is accomplished in the previous sprint, and present a demo of new features.	End of sprint	Virtual (Zoom)
Scrum Master	Sprint Retrospective	Dev Team	Discuss any improvements and what should be kept for the next sprint.	End of sprint	Virtual (Zoom)

Project Overview

Background Description

AquaTerra was created to enable smart farming through soil intelligence. AquaTerra's sensors measure critical soil parameters - such as moisture and temperature. The information is made available to agronomists and farmers anytime and anywhere through a web app. The original web application provides: 1. Real time soil moisture (M), temperature (T) and daily reference evapotranspiration (ET₀); 2. Location insights into irrigation needs and/or sowing/harvesting time; 3. Local weather conditions and 5-day forecast; 4. On demand summary report creation (M, T, ET₀) and data download. By having these functionalities built onto a mobile application, AquaTerra aims to enhance customer experience by optimizing data presentation.

Reference: <https://aqua-terra.com.au/index.html>

Project Scope

★ Mobile Application Development

Design and develop a user-friendly mobile application to empower farmers to effectively manage and monitor sensor data from their farm fields. The application will provide a convenient platform for accessing real-time and historical data related to soil moisture, moisture depth, soil temperature, evaporation, and precipitation variations captured by the sensors.

★ The transition from Web to Mobile

Successfully migrate features from the existing AquaTerra web platform to the mobile application. This transition should maintain core feature consistency while optimizing the user experience for mobile devices.

★ Comprehensive Data Monitoring

To enable farmers to have a comprehensive view of their farm's status by offering insights into critical parameters. Farmers should be able to track fluctuations in moisture levels and temperature, allowing for timely adjustments in irrigation and other farming practices.

★ Enhanced Data Representation

To present sensor data in a visually appealing and understandable manner. The mobile application will utilize graphs, charts, and intuitive interfaces to convey complex data trends and patterns, enabling farmers to make informed decisions based on the information at hand.

★ Real-time Notifications

To provide a mechanism for sending real-time notifications and alerts to farmers. Alerts can be triggered by specific conditions such as sudden changes in moisture levels, extreme temperatures, or other parameters that may impact crop health. This feature ensures that farmers can respond promptly to emerging challenges.

Note: In-scope features are transformed into User Stories in the [Product Backlog](#).

Updated: Client Meeting - 2023/08/18

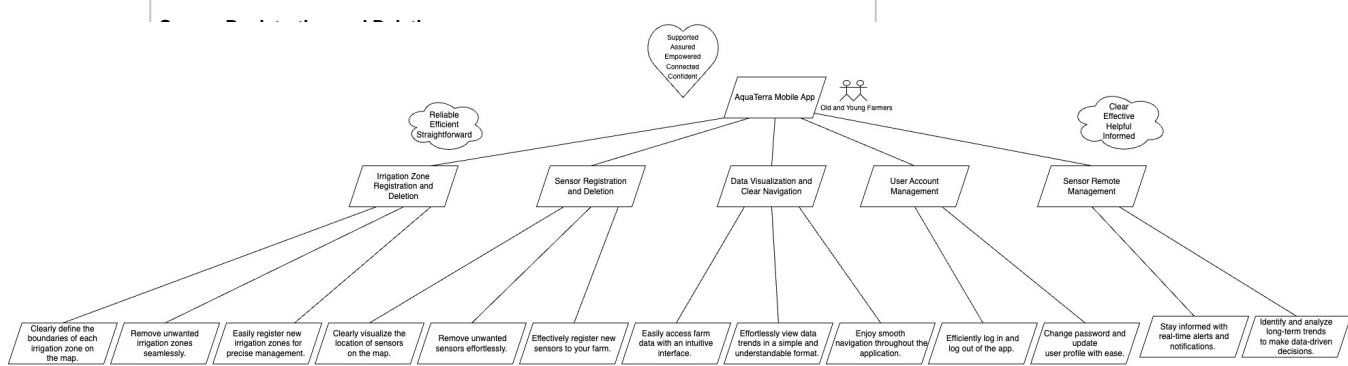
During the second client meeting, two more features were identified to be Out-Of-Scope, including a welcome email for successful user registration and self-registration.

Out-Of-Scope Features

- Design and develop extra pages that are not present in the current web app.
- Develop the 'Fieldwork' section in the Aquaterra mobile app.
- Welcome Emails for successful user registration.
- Allow users to register by themselves using the Aquaterra mobile app.

Do-Be-Feel List (Updated Version)

Who	Do	Be	Feel
Old Farmers Young Farmers	<p>Motivational Model (Updated Version)</p> <p>Data Visualization and User-Friendly Navigation:</p> <ul style="list-style-type: none">• Easily access farm data with an intuitive interface.• Effortlessly view data trends in a simple and understandable format.• Enjoy smooth navigation throughout the application. <p>User Account Management:</p> <ul style="list-style-type: none">• Efficiently log in and log out of the app.• Change your password and update your user profile with ease. <p>Sensor Remote Management:</p> <ul style="list-style-type: none">• Stay informed with real-time alerts and notifications.• Identify and analyze long-term trends to make well-informed, data-driven decisions.	Reliable Efficient Straightforward Clear Effective Helpful Informed	Supported Assured Empowered Connected Confident



Project Requirements

[User Persona](#)

[Product Backlog](#)

[Prototypes](#)

[Application Workflow](#)

User Persona

Initial communication with clients

Following our group meeting with the client, it was explicitly communicated that the AquaTerra mobile app is intended for **farmers**. This application serves as a complementary tool to the sensor hardware, aiding farmers in monitoring crucial indicators like moisture levels and precipitation variations.

Updated - 18/08/2023

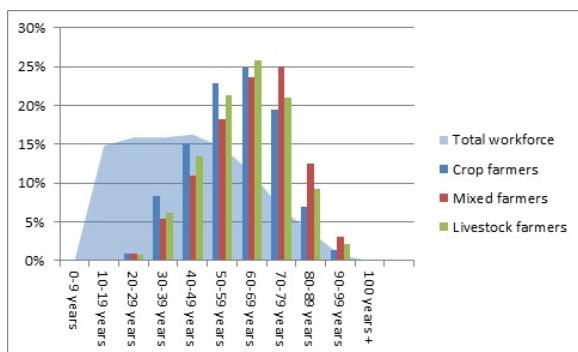
The client has expressed contentment with the user persona that has been developed. In particular, the client holds the view that the persona of the young farmer, Dave Smith, is notably accurate and thorough in its representation. However, when it comes to the persona of the older farmer, Samuel Bundarra, the client has raised a valuable point. The client has pointed out that a subset of the older farmer demographic might face challenges in downloading applications, thus constituting approximately 10% of the entire user base. Despite this observation, the client maintains a positive outlook on the personas, deeming them accurate and detailed.

Client Meeting Minutes - Date 17/08/2023

Research on farmer demographics

Based on our study of Australian farmers' demographics and insights from Australian farm institutes, our findings align with recent research by Deloitte Australia. Their report on agriculture emphasises the challenge of an aging farmer population. The average age of Australian farmers is 52, which is 12 years older than the national average for other jobs.

This aging trend is expected to lead to more farmers retiring soon, which could result in a shortage of skilled farmers. To address this, around \$400 billion may be needed for the transition of farm ownership to new individuals. This investment aims to ensure that younger farmers take over the farms and continue agricultural practices.



Reference: <https://www.farminstitute.org.au/farmers-are-getting-older-but-its-not-a-problem/>

According to this information, our team believes that there are two typical types of farmers our mobile application is going to serve:

- **The Aging Generation** This segment comprises older farmers who have accumulated years of experience and knowledge in the field. As they approach retirement, they can utilize the AquaTerra mobile app to facilitate a smoother transition of their farming operations.
- **The New Generation** With the aging demographic in mind, the new generation of farmers will be crucial in sustaining the future of Australian agriculture. These younger farmers will leverage the app's user-friendly interface to gain insights into farming. Equipped with this data, they can make informed decisions and apply their innovative approaches to farming practices.

Personas

The following 2 user personas are made using PersonaGenerator:

Dave Smith

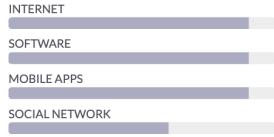


age: 30
residence: Melbourne, VIC
education: Bachelor of Computer Science | Bachelor of Agriculture
occupation: Farmer
marital status: Single

I love farming, but also technology.

Dave owns a medium-sized family farm. He inherited the farm recently and is looking for some innovative solutions to improve his farming practices. He is comfortable with adopting technology and is currently using the Aquaterra webapp to monitor his field's conditions. As a beginner, he is keen to learn more about farming.

Comfort With Technology



Criteria For Success:

Being graduated from a Computer Science and an Agriculture degree, Dave sees success in his ability to effectively use modern technology to enhance his farming operations. Mastery over technical tools used in farms reflects his competence in both farming and technology. As he just inherited the farm, making the farm operating better than before using his knowledge in technology would be an accomplishment and also a good way to learn farming practices.

Needs

- Get to know modern technologies and use them into his family farm
- Efficient and effective management of his farm.
- Optimize farm assistance to minimize costs.

Values

- Knowledge and skills in both farming and technology
- Reducing expenses while boosting efficiency

Wants

- Adopting new tools to efficiently manage the family farm
 - Customized solution
 - Efficient Resource Management
-
- ### Fears
- Reliability and accuracy of the sensor's returning data
 - Security and privacy of sensitive farm-related data
 - Excessive reliance on technology might hinder his ability to manage the farm manually if needed

Samuel Bundarra

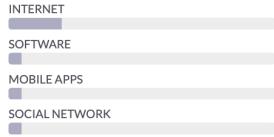


age: 66
residence: Melbourne, VIC
education: High School
occupation: Farmer
marital status: Divorced | One Child

My farm is my family.

Samuel has been working on his family-owned farm for decades. He has a wealth of experience in traditional farming methods but he recently injured his legs, yet he is the sole caretaker of his farm. Due to his age and injuries, Samuel struggles with mobility and cannot visit the fields as often as he used to. He needs a portable application that allows him to monitor his fields remotely and make necessary decisions.

Comfort With Technology



Criteria For Success:

Samuel's primary goal is to keep his farm operational. Farming is not just a livelihood for him, it is a way of life and a connection to his family's history. Generate enough income from farming to cover living expenses, invest in improvements, and secure his future life are also important.

Needs

- High and consistent crop yields
- Someone's help with farming
- Alerts when necessary so he does not need to check fields daily

Values

- Nice weather and stable field conditions
- Ability to take care of himself and his land
- Simplicity of farm life

Wants

- Extremely user-friendly and straightforward tools to help with farming
- Remote monitoring of farm

Fears

- Physical limitations due to his injuries and age
- Difficulty with using new technical tools and applications



Dave Smith's persona _ PersonaGenerator.pdf



Samuel Bundarra's persona _ PersonaGenerator.pdf

PersonaGenerator link: <https://personagenerator.com/>

Product Backlog

Client Feedback

This page was reviewed by the client during the client meeting. The client was overall satisfied with the product backlog. However, it is imperative to highlight that the client has a query regarding EP05 (User Registration). Currently, they undertake manual user registration upon sensor purchases, sending over usernames and passwords to users for them to log in. A point of consideration is whether users should autonomously create accounts for the mobile application. To clarify this aspect, consultation with their own development team is needed. Once confirmation is received from the client, a copy of this backlog will be sent to the client for further review.

[Client Meeting - 2023/08/17](#)

The epics/feature-level user stories are split into four sections: **data visualization clear navigation; registering sensors into the farm remotely; managing sensors remotely; managing irrigation zones remotely; and user registration**, which leads to the product backlog in the below table.

Completing the Product Backlog would require a total of 56 Story Points.

Please refer to the [Story Point Estimation Process and Prioritization Method here](#).

Epic ID	Epic	User Story ID	As	I Want To	So That	Size Estimation	MoSCoW Priority	Justification	Story Point
EP01	As an app user, I want data visualization and clear navigation , so that I have a good experience using the app.	US001	Dave (Young Farmer & Existing User)	Have an informative dashboard home page.	I can choose to see my field's conditions straight away.	Large	Must Have	<p>Size estimation: It contains a lot of information and is connected to other pages.</p> <p>MoSCoW priority: The dashboard should be the home page as it matches the original web app.</p>	5
		US002	Samuel (Elder Farmer & New User)	Have a friendly interface with clear visuals and large buttons to easily get to each page.	I do not get lost in navigation.	Medium	Should Have	<p>Size estimation: Have to design each page's layout.</p> <p>MoSCoW priority: Important as we need to consider elder farmers who do not often use mobile apps.</p>	3
		US003	Dave (Young Farmer & Existing User)	Have important data highlighted/ enlarged on the dashboard.	I can see the most useful data at the first glance.	Small	Should Have	<p>Size estimation: Simply change the font or colour of the temperature and moisture data.</p> <p>MoSCoW priority: This was mentioned to be a user pain point on the original web app.</p>	2
		US004	Dave (Young Farmer & Existing User)	View Weather prediction	I can anticipate weather conditions for better planning.	Medium	Must Have	<p>Size estimation: Incorporating weather data integration and display.</p> <p>MoSCoW priority: Part of original web app features.</p>	3
		US005	Samuel (Elder Farmer & New User)	See details of each sensor	I can access specific sensor information for monitoring.	Medium	Must Have	<p>Size estimation: Developing 'view details' functionality.</p> <p>MoSCoW priority: Part of original web app features.</p>	3

EP02	As an app user, I want to register sensors into the farm remotely using the app so that it can be more convenient for me.	US006	Dave (Young Farmer & Existing User)	Register Gateways.	I can allow my sensors to connect to them later.	Medium	Must Have	<i>Size estimation:</i> Developing gateway registration logic. <i>MoSCoW priority:</i> Essential for sensor connectivity.	3
		US007	Dave (Young Farmer & Existing User)	Delete Gateways.	I can remove unused Gateway resources.	Small	Should Have	<i>Size estimation:</i> Implementing gateway deletion functionality. <i>MoSCoW priority:</i> Ensures proper resource management.	2
		US008	Dave (Young Farmer & Existing User)	Register new farms and fields.	I can later select those fields I want my sensors installed.	Medium	Must Have	<i>Size estimation:</i> Developing farm and field registration logic. <i>MoSCoW priority:</i> Essential for proper setup.	3
		US009	Dave (Young Farmer & Existing User)	Delete farms or fields	I can remove those fields that are mistakenly registered or no longer need sensors.	Small	Should Have	<i>Size estimation:</i> Implementing farm and field deletion functionality. <i>MoSCoW priority:</i> Enhances usability and resource management.	2
		US010	Dave (Young Farmer & Existing User)	Register Version 1 physical sensors with selected fields.	I can later check my field's data from the paired sensor.	Medium	Must Have	<i>Size estimation:</i> Developing sensor registration logic. <i>MoSCoW priority:</i> Essential for proper data monitoring.	3
EP03	As an app user, I want to manage sensors remotely using the app so that it can be convenient for me.	US011	Dave (Young Farmer & Existing User)	Download the report of data from my dashboard.	I can conduct data analysis to discover trends and make more informed decisions about farm management.	Medium	Should Have	<i>Size estimation:</i> Managing exported report format may require effort. <i>MoSCoW priority:</i> This was part of the original web app features.	3
		US012	Samuel (Elder Farmer & New User)	Create new Version 2 sensors in fields.	I can expand my monitoring capabilities.	Small	Must Have	<i>Size estimation:</i> Developing sensor creation functionality. <i>MoSCoW priority:</i> This was part of the original web app features.	2
		US013	Samuel (Elder Farmer & New User)	View and edit existing sensors.	I can manage sensor details as needed.	Small	Must Have	<i>Size estimation:</i> Developing sensor editing functionality. <i>MoSCoW priority:</i> This was part of the original web app features.	2
		US014	Samuel (Elder Farmer & New User)	Delete sensors from the field.	I can remove sensors no longer needed.	Small	Should Have	<i>Size estimation:</i> Implementing sensor deletion functionality. <i>MoSCoW priority:</i> This was part of the original web app features.	2

		US015	Samuel (Elder Farmer & New User)	Have customized alerts (battery, moisture, temperature etc.).	I can take immediate action whenever needed.	Medium	Must Have	<i>Size estimation:</i> Need to connect with the AWS service and database. <i>MoSCoW priority:</i> This was required by the client and is considered to be a key feature in the app.	3
EP04	As an app user, I want to manage irrigation zones remotely using the app so that it can be convenient for me.	US016	Dave (Young Farmer & Existing User)	Create new irrigation zones.	I can efficiently manage water distribution.	Small	Must Have	<i>Size estimation:</i> Developing irrigation zone creation logic. <i>MoSCoW priority:</i> This was part of the original web app features.	2
		US017	Dave (Young Farmer & Existing User)	View and Edit existing irrigation zones.	I can adjust irrigation parameters as needed.	Small	Must Have	<i>Size estimation:</i> Developing irrigation zone editing functionality. <i>MoSCoW priority:</i> This was part of the original web app features.	2
		US018	Dave (Young Farmer & Existing User)	Delete irrigation zones.	I can remove unnecessary irrigation zones.	Small	Should Have	<i>Size estimation:</i> Implementing irrigation zone deletion functionality. <i>MoSCoW priority:</i> This was part of the original web app features.	2
EP05	As an app user, I want a place to do user registration so that I can use more features of the tool.	US019	Dave (Young Farmer & Existing User)	Change my password.	I can allow myself to be registered.	Small	Should Have	<i>Size estimation:</i> Need to connect with the database. <i>MoSCoW priority:</i> Only registered users can access the dashboard and all features.	2
		US020	Dave (Young Farmer & Existing User)	I want to edit my profile	I can customize my profile.	Small	Should Have	<i>Size estimation:</i> Need to connect with a database to store the information. <i>MoSCoW priority:</i> This is part of the original web app features.	2
		US021	Dave (Young Farmer & Existing User)	Have a log-out option.	I can quit this app safely.	Small	Should Have	<i>Size estimation:</i> A simple feature to log the user out of the app. <i>MoSCoW priority:</i> This is part of the original web app features.	1
		US022	Dave (Young Farmer & Existing User)	Have an initial log-in page	I can log in to my account.	Small	Must Have	<i>Size estimation:</i> A simple feature to log the user out of the app. <i>MoSCoW priority:</i> This is part of the original web app features.	2

ChatGPT Generated User Stories

User Story ID	Prompt
US015	Generate a comprehensive user story in the format of I want to... so that... for old farmers regarding customized farm condition alerts.
US003	Generate a comprehensive user story in the format of I want to... so that... for old farmers under the epic As an app user, I want data visualization and straightforward navigation, so that I have a good experience using the app.

Prototypes

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 - [Gateway Management](#)
 - [Irrigation Zone Management](#)
 - [Sensor Management](#)
 - [User Profile](#)
 - [Farm Management](#)

Client Feedback (Initial Feedback)

The client evaluated the initial design in a recent meeting and expressed contentment with the present design of the user login pages. No additional feedback was provided regarding the colour or font selections. During the discussion, it was noted that the client prefers the company name positioned above the company icon instead of having the icon solely on the page. Additionally, they expressed interest in incorporating farm imagery into the background, akin to their web application.

Client Meeting - Date 17/08/2023

Client Feedback (Second Feedback)

The client's level of satisfaction with our current prototype designs is exceptionally high, and they have expressed their enthusiasm by describing it as "great" and indicating that it has exceeded their initial expectations. This positive feedback speaks to the quality and effectiveness of the work we have done so far. It's worth noting that the client's feedback was overwhelmingly positive, with only one minor issue related to a wording choice that needed to be addressed. Importantly, this minor concern has already been rectified in subsequent iterations of the prototypes.

Client Meeting - Date 08/09/2023

[Link to Prototypes](#)



User Login Page

Login

AquaTerra

Email

Password

Forget Password

Login

or

Create New Account

Login 3

AquaTerra

demo@gmail.com

.....

Forget Password

Login

or

Create New Account

Login 4

AquaTerra

demo@gmail.com

Admin456

Incorrect Password

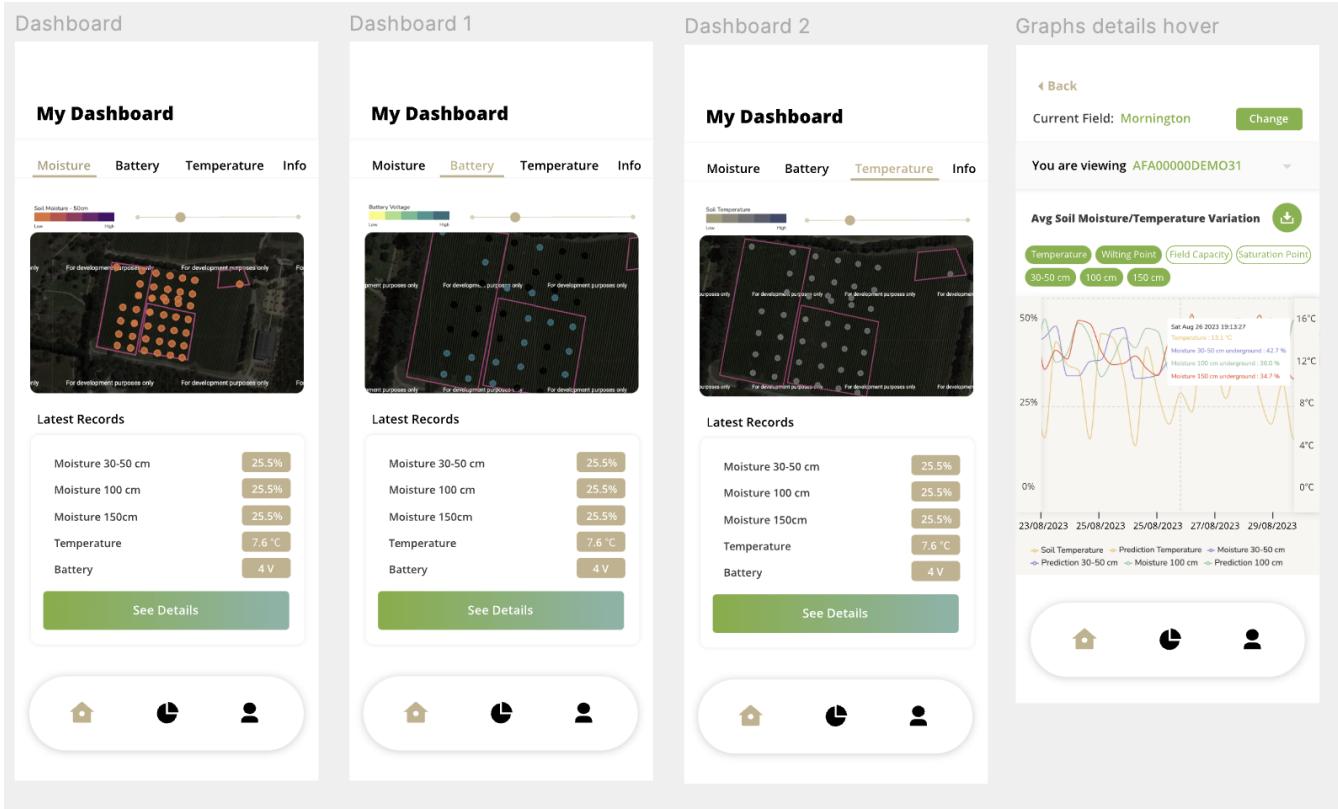
Forget Password

Login

or

Create New Account

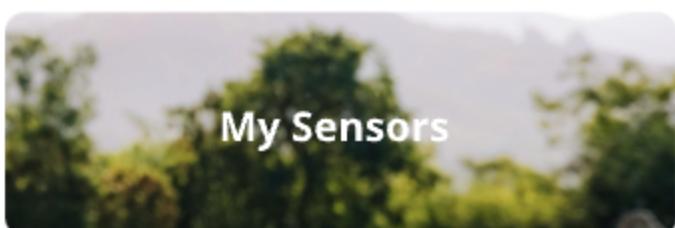
Reset Password Page

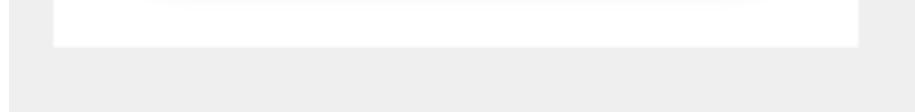


Farm Management

Farm Management

Farm Management





Gateway Management

My Gateways

◀ Back

My Gateways

NO.	Gateway ID	Action
1	AquaTerraGateway909a56	X
2	AquaTerraGateway909a56	X
3	AquaTerraGateway909a56	X
4	AquaTerraGateway909a56	X

Add Gateway

◀ Back

Gateway Registration step 1

1 ID 2 Position 3 Submit

Please Enter your gateway ID:
Note: The gateway ID is provided with your purchase.

Example: AquaTerraGateway909a56

Next

◀ Back

Gateway Registration step 1 valid

1 ID 2 Position 3 Submit

Please Enter your gateway ID:
Note: The gateway ID is provided with your purchase.

AquaTerraGateway909a56

Next

◀ Back

Gateway Registration

1 ID 2 Position 3 Submit

Gateway Registration step 2

Gateway Registration

1 ID 2 Position 3 Submit

Please add a marker using icon to locate your gateway on the map.

Undo Next

Gateway Registration step 3

Gateway Registration

1 ID 2 Position 3 Submit

Please submit to finish registering your gateway:

AquaTerraGateway909a56

Submit

Gateway Deletion

1 AquaTerraGateway909a56

2 Gateway Deletion

3 All sensors connected to this gateway will be deleted. Are you sure?

4 Delete Cancel

Irrigation Zone Management

My Irrigation Zone

NO.	Zone	Crop	Action
1	TestZone1	Rice	
2	TestZone2	Rice	
3	TestZone3	Rice	
4	TestZone4	Rice	

Choose Field to display

Choose A Field

Mornington

Field 1

Select

Choose Field to display - selected

Choose A Field

Mornington

Field 1

Select

Zone Deletion

1 Zone Deletion

2 Are you sure you want to delete this zone?

3 Delete Cancel

View Zone

[◀ Back](#)

View Zone

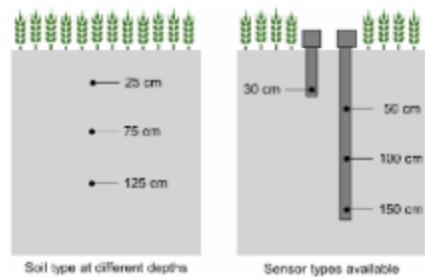
Zone Basic Information

Farm DemoFarm >

Field Mornington >

Zone Name TestZone

Crop Type Crop >



Soil Type, Wilting Point, Field Capacity, Saturation Point

Soil Type 25cm Underground Loam >

Wilting Point 30-50cm 7

Field Capacity 30-50cm 20

Saturation Point 30-50cm 30

Soil Type 75cm Underground Loam >

Wilting Point 150cm 7

Field Capacity 150cm 20

Saturation Point 150cm 30

Soil Type 75cm Underground Loam >

Edit Zone step 1

[◀ Back](#)

Edit Zone

1 Info
2 Plot
3 Submit

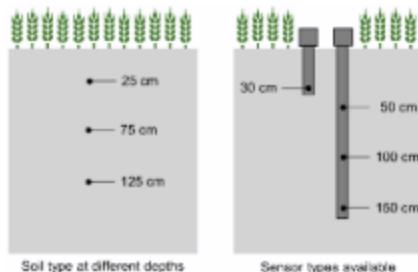
Zone Basic Information

Farm DemoFarm >

Field Mornington >

Zone Name TestZone

Crop Type Crop >



Soil Type, Wilting Point, Field Capacity, Saturation Point

Soil Type 25cm Underground Loam >

Wilting Point 30-50cm 7

Field Capacity 30-50cm 20

Saturation Point 30-50cm 30

Soil Type 75cm Underground Loam >

Wilting Point 150cm 7

Field Capacity 150cm 20

Wilting Point 100cm	7	Saturation Point 150cm	30
Field Capacity 100cm	20	Soil Type 75cm Underground	Loam >
Saturation Point 100cm	30	Wilting Point 100cm	7
Soil Type 125cm Underground	Loam >	Field Capacity 100cm	20
Wilting Point 150cm	7	Saturation Point 100cm	30
Field Capacity 150cm	20	Soil Type 125cm Underground	Loam >
Saturation Point 150cm	30	Wilting Point 150cm	7
		Field Capacity 150cm	20
		Saturation Point 150cm	30

Navigation: Home, Soil, User Profile

Buttons: Next

Edit Zone step 1 input

← Back

Edit Zone

1 Info 2 Plot 3 Submit

Zone Basic Information

Farm DemoFarm >

Field Mornington >

Zone Name TestZone

Done

Please select a response

Victoria
New South Wales
Queensland

Edit Zone step 1 input 2

← Back

Edit Zone

1 Info 2 Plot 3 Submit

Zone Basic Information

Farm DemoFarm >

Field Mornington >

Zone Name

I q w e r t y u i o p
a s d f g h j k l
z x c v b n m
123 ! @ # \$ % ^ & _
space done
undo

Edit Zone step 2

← Back

Edit Zone

1 Info 2 Plot 3 Submit

Please draw a polygon shape on the map using the icon to outline your zone.

Undo Next

Navigation: Home, Soil, User Profile

Edit Zone step 3

← Back

Edit Zone

1 Info 2 Plot 3 Submit

Please submit to finish registering your Zone:

TestZone

Submit

Navigation: Home, Soil, User Profile

Sensor Management

My Sensors

Current Field: Mornington Change

Id	Gateway	Action
AFA00...	AquaTerraGatewayDemo01	edit delete
AFA00...	AquaTerraGatewayDemo01	edit delete
AFA00...	AquaTerraGatewayDemo01	edit delete

Choose A field to display

Cancel Select

Test Farm

- Mornington
- Field 1

Test Farm

- Mornington
- Field 1

Choose A field to display valid

Cancel Select

Test Farm

- Mornington
- Field 1

Test Farm

- Mornington
- Field 1

Sensor Deletion

Current Field: Mornington Change

Id	Gateway	Action
AFA00...	AquaTerraGatewayDemo01	edit delete
AFA00...	AquaTerraGatewayDemo01	edit delete
AFA00...	AquaTerraGatewayDemo01	edit delete

Sensor Deletion X

Are you sure you want to delete this sensor ?

Delete Cancel

Edit Sensor step 1

Back Info Plot Submit

Sensor ID: AFA00000DEMO31

Alias: null

Latitude: -38.280853

Longitude: 165

Sleeping Time (hr): 30 (sec)

Next

Edit Sensor step 2

Back Info Plot Submit

Please place a marker using location icon to locate your sensor on the map.



Undo Next

Edit Sensor step 3

Back Info Plot Submit

Please submit to finish editing your sensor:

AFA00000DEMO31

Submit

User Profile

User Profile	Change Email	Change Email Verify...	Change Email Verify...	Change Email Verify...	Change Email Verify...
User Profile Please fill in the profile you want to modify. Username: Vinci Expired Date: valid until 29-8-2023 Subscription Type: Full Phone Number: 0481998586 Edit Address: 000 demo st Edit Change Email > Change Password >	Change Email A verification code will be sent to your new email. <input type="text" value="Please enter your new email"/> Next	Change Email A verification code will be sent to your new email. <input type="text" value="utoplabanned@163.com"/> Next	Change Email Please enter in the verification code we just sent to your updated email. <input type="text" value="Verification Code"/> <input type="text" value="123456"/> Submit	Change Email Please enter in the verification code we just sent to your updated email. <input type="text" value="123456"/> <small>Incorrect Verification Code</small> Submit	Change Email Please enter in the verification code we just sent to your updated email. <input type="text" value="1234567890"/> <small>1234567890</small> <small>1234567891</small> <small>Passwords do not match.</small> Submit
Change Password	Change Password 2	Change Password - ...	Change Password - ...	Change Password - ...	Change Password - ...
Change Password Please enter your old password. <input type="text" value="Old Password"/> Next	Change Password Please enter your old password. <input type="text" value="123456"/> Next	Change Password Please enter your old password. <input type="text" value="123456"/> <small>Incorrect Old Password</small> Next	Change Password Please enter your new password. <input type="text" value="New Password"/> <input type="text" value="1234567890"/> Next	Change Password Please enter your new password. <input type="text" value="New Password Confirmation"/> <input type="text" value="1234567890"/> Next	Change Password Please enter your new password. <input type="text" value="1234567890"/> <small>1234567891</small> <small>Passwords do not match.</small> Next

Farm Management

My Farms and Fie...

Choose A farm to...

Choose A farm to...

Farm Deletion

Farm Registration...

Farm Registration...

Farm Registration...

My Farms and Fields

Current Farm: TestFarm [Change](#) [Delete](#) [Add New Field](#)

NO.	Field	Crop	
1	Morning...	Rice	
2	Morning...	Rice	
3	Morning...	Rice	
4	Morning...	Rice	

Choose A Farm [Select](#)

- Mornington Farm
- Telstra Farm

Choose A Farm [Select](#)

- Mornington Farm
- Telstra Farm

Farm Deletion

Are you sure you want to delete this farm?

[Delete](#) [Cancel](#)

Farm Registration

Please enter a farm name and a field name to proceed.

Farm Name:

Field Name:

[Next](#)

Farm Registration

Please draw a polygon shape on the map using the 'v' to outline your field.
The field must be within 1000 metres from the gateway.

[Info](#) [Plot](#) [Submit](#)

Farm Registration

Please submit to finish registering your field.

HappyField

[Submit](#)

Sensor Registrati...

Sensor Registrati...

Sensor Registrati...

Sensor Registrati...

Notifi...

Sensor Registration

1 Gateway Found

AquaTerraGatewayDemo01

[Next](#)

Sensor Registration

No gateway found within this field range. Please try again.

Go to My Gateways to add a new Gateway

[Next](#)

Sensor Registration

Searching Pairing Submit

• Press and hold the physical sensor button until it flashes, one sensor at a time.
• Wait about 10 seconds and the sensor will flash twice after the sensor has successfully paired with the gateway.
• If pairing is unsuccessful, the sensor will flash rapidly. In that case, retry step 1 or contact AquaTerra support

[Cancel](#) [Next](#)

Sensor Registration

No Sensor Found

[Submit](#)

Notifi...

Registration Successful

Registration Failed

Application Workflow

For a better view, please access the workflow chart [here](#).

Log-In Navigation

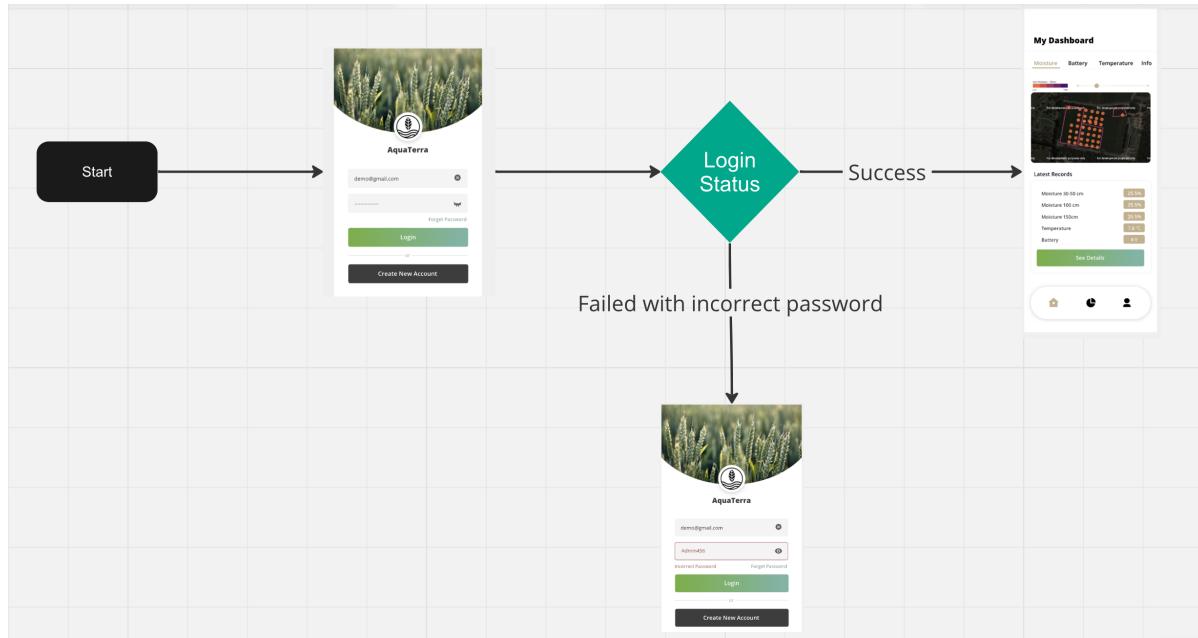
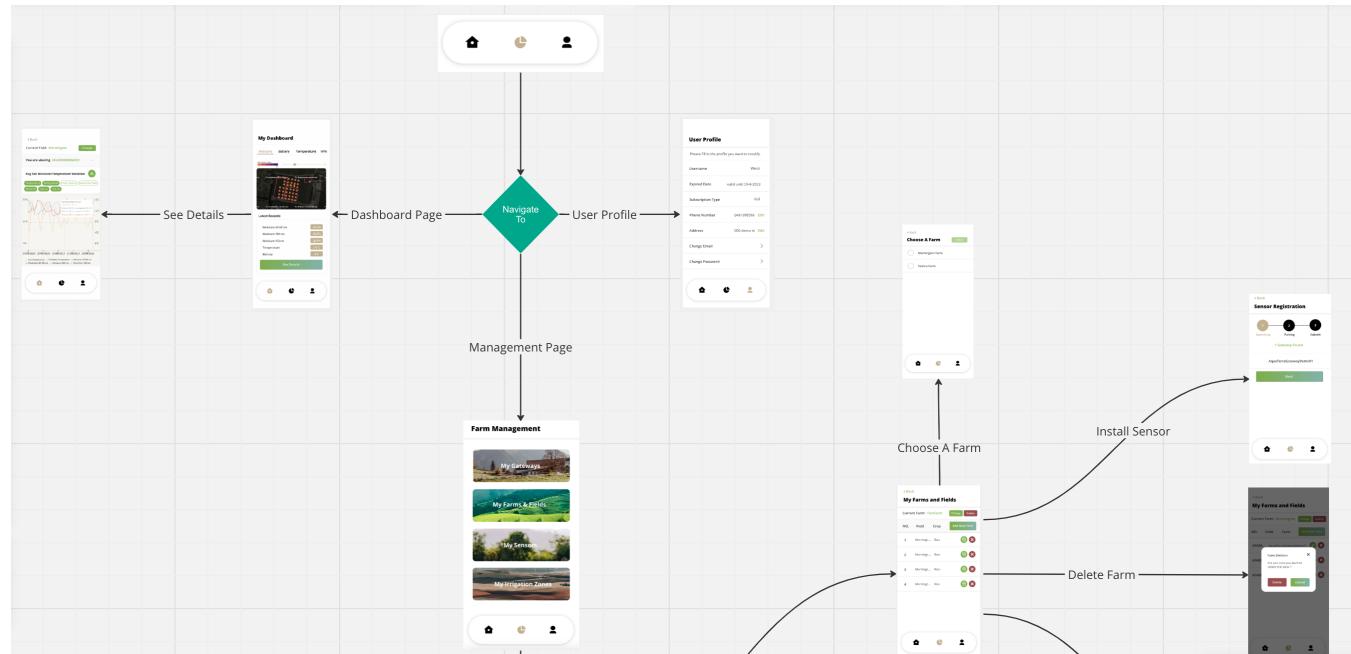


Figure: Log-In Navigation Diagram

Navigation Bar and Relevant Pages Navigation



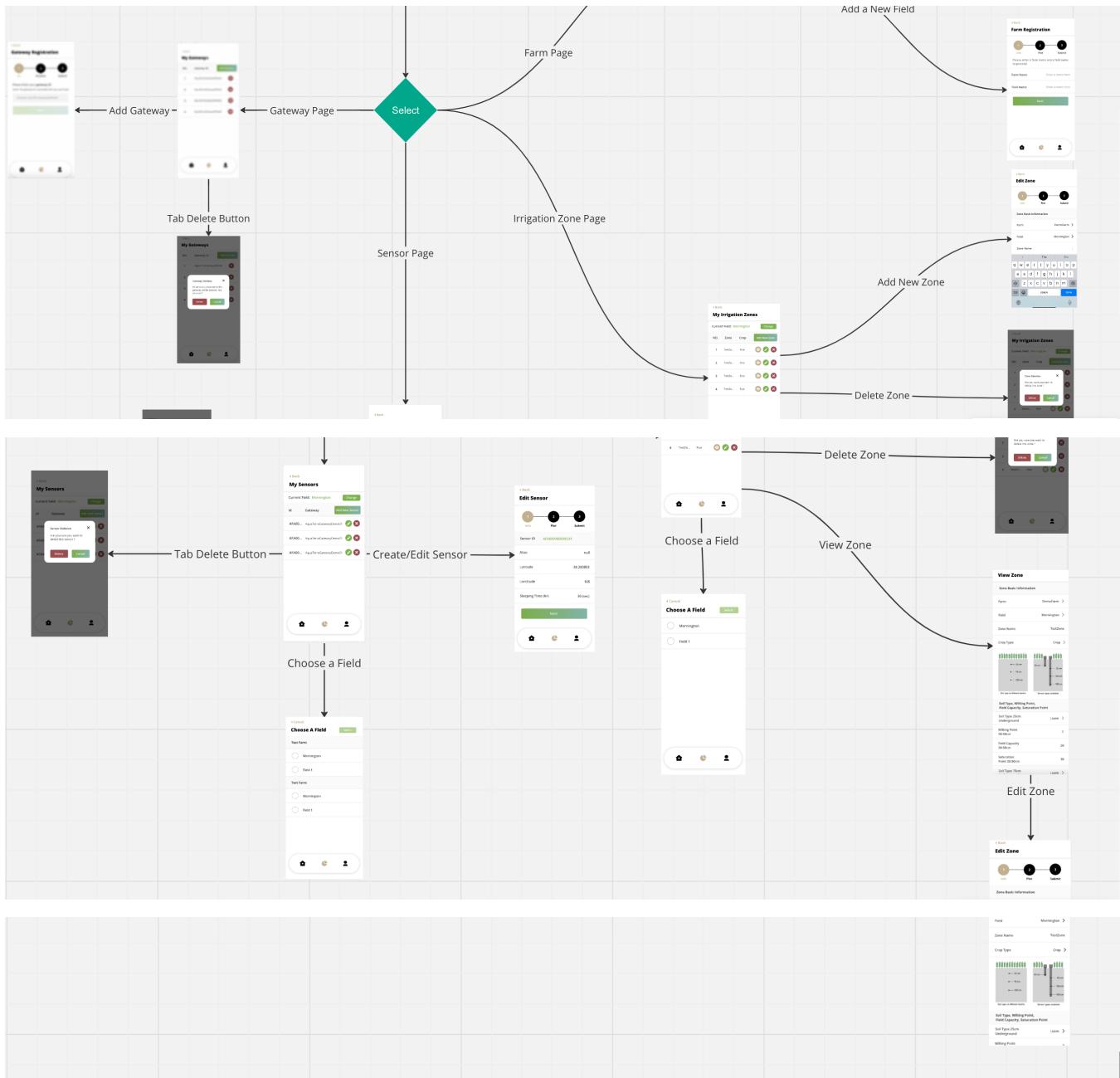


Figure: Full view of navigation flow

Project Plan

JIRA KANBAN Board

[Jira Board Link](#)

[Project Timeline](#)

Sprint Backlog

[Sprint 2 Plan\(18/08/2023 - 22/09/2023\)](#)

[Sprint 3 Plan\(22/09/2023 - 20/10/2023\)](#)

Project Timeline

Please access the most recent project timeline here: [Timeline](#)

Note: For user stories that have not been planned yet, the deadline will be determined after the corresponding sprint planning meeting.

Epic Level TimeLine



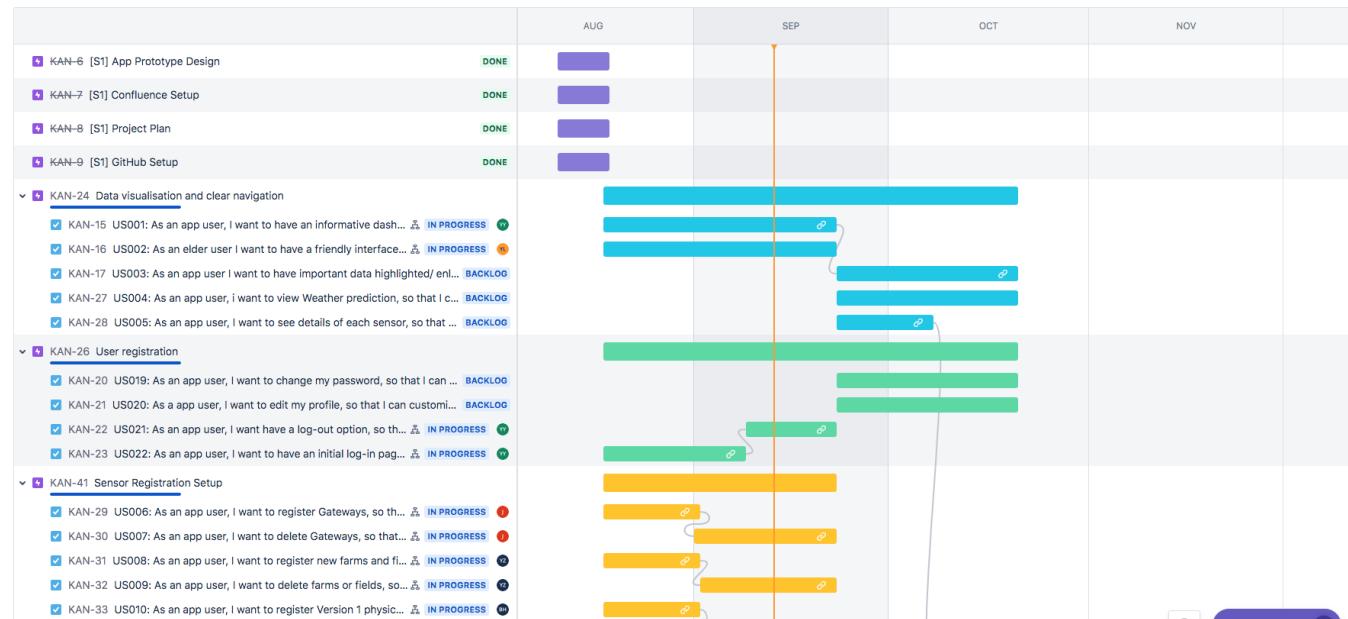
User Story Level Timeline with Dependencies

Dependency Explanation

Please refer to [Product Backlog](#) for user story details.

Below the dependency format is structured as: **Pre-requisite Task** **Task that requires completion or partial completion of its Pre-requisite Task**

- US001 US003:** Dashboard should exist first before any extra polishing can be done.
- US005 US011:** Detailed data of Sensors should be successfully extracted and analyzed before the report can be generated.
- US006 US007 / US008 US009/ US010, US012 US014/ US016 US018:** Any deletion of items only happens after Registration of the item is done.
- US0100, US012 US013, US016 US017:** Registration should be done before editing and viewing.
- US016 US015:** Alert parameters are based on irrigation zone settings.
- US022 US021:** Log-out only happens after log-in.





User Story Mapping

Below roadmap presents the initial mapping of user stories, representing a baseline for future sprint planning.



Sprint 2 Plan(18/08/2023 - 22/09/2023)

Subject to Change

This page presents a current plan and user story mapping for Sprint 2. The finalized version will be done at the end of Sprint 2

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- [Acceptance Criteria](#)

Jira KANBAN Board Access

Please access the most recent [JIRA KANBAN Board here](#)

Sprint 2 Goal

1. Set up and implement a **Login page** and implement **login functionality** to allow the registered users to go to the Dashboard page.
2. Set up the **connection to AquaTerra's user databases** to pull and push data.
3. Design the layout of the **Dashboard** page.
4. Finish implementing **sensor registration functionality** (including Gateway and Farm & Field pages)

Sprint 2 development work is allocated to two groups to follow the **pair programming approach**. As we have an uneven number of group members, GROUP 2 has three people but each two of them can still conduct pair programming:

GROUP 1 [Yunqing Yu](#) and [Yilin Liu](#)

GROUP 2 [YOU ZHOU](#), @Jiakang Li and [BOWEI HUANG](#)

Please refer to the [Story Point Estimation Process](#) here.

Task Status - IN PROGRESS COMPLETED DELAYED ABORTED

Epic ID	Epic	User Story ID	Sprint Backlog User Story	Tasks	Story Points	Owner	Status	Due Date
EP01	As an app user, I want data visualisation and clear navigation , so that I have a good experience using the app.	US001	As an app user, I want to have an informative dashboard home page, so that I can choose to see my field's conditions straight away.	1.1 Design the high-fidelity prototype for the dashboard page 1.2 Display relevant data retrieved from databases according to the user account 1.3 Finalize front-end development of the dashboard according to the prototype	5	GROUP 1	COMPLETED	22/09 /2023
		US002	As an elder user, I want to have a friendly interface with clear visuals and large buttons to easily get to each page so that I do not get lost in navigation.	2.1 Design the high-fidelity prototype for the navigation bars/tabs/buttons with a user-centric mindset, and ensure high usability (especially for the elderly) 2.2 Finalize front-end development of the navigation items according to the prototype 2.3 Link each button to relevant pages	3	GROUP 1	COMPLETED	22/09 /2023

EP02	As an app user, I want to register sensors into the farm remotely using the app so that it can be more convenient for me.	US006	As an app user, I want to register Gateways, so that I can allow my sensors to connect to them later.	6.1 Design the high-fidelity prototype for the Gateway registration process 6.2 Connect with relevant databases to add new Gateway records 6.3 Display relevant Gateway data retrieved from databases based on the user account 6.4 Finalize front-end development for the Gateway registration process according to prototype	3	GROUP 2	COMPLETED	10/09 /2023
		US007	As an app user, I want to delete Gateways, so that I can remove unused Gateway resources.	7.1 Design the high-fidelity prototype for the Gateway deletion process 7.2 Retrieve the selected Gateway from relevant databases for deletion 7.3 Finalize front-end development for the Gateway deletion process according to prototype	2	GROUP 2	COMPLETED	22/09 /2023
		US008	As an app user, I want to register new farms and fields, so that I can later select those fields I want my sensors installed.	8.1 Design the high-fidelity prototype for the farm/field registration process 8.2 Connect with relevant databases to add new farm /field records 8.3 Display relevant farm /field data retrieved from databases based on the user account 8.4 Finalize front-end development for the farm /field registration process according to prototype	3	GROUP 2	COMPLETED	10/09 /2023
		US009	As an app user, I want to delete farms or fields, so that I can remove those fields that are mistakenly registered or no longer need sensors.	9.1 Design the high-fidelity prototype for the farm/field deletion process 9.2 Retrieve the selected farm /field from relevant databases for deletion 9.3 Finalize front-end development for the farm /field deletion process according to prototype	2	GROUP 2	COMPLETED	22/09 /2023
EP03	As an app user, I want to manage sensors remotely using the app so that it can be convenient for me.	US012	As an app user, I want to create new Version 2 sensors in fields, so that I can expand my monitoring capabilities.	12.1 Design the high-fidelity prototype for the Version 2 sensor registration process 12.2 Connect with relevant databases and link to selected fields to add new sensor records 12.3 Finalize front-end development for the Version 2 sensor registration process according to the prototype	2	GROUP 2	COMPLETED	16/09 /2023
		US013	As an app user, I want to view and edit existing sensors, so that I can manage sensor details as needed.	13.1 Design the high-fidelity prototype for the Version 2 sensor details page 13.2 Connect with relevant databases and link to the selected sensor for modification 13.3 Finalize front-end development for the Version 2 sensor detail page according to the prototype	2	GROUP 2	COMPLETED	22/09 /2023

EP05	As an app user, I want a place to do user registration so that I can use more features of the tool.	US021	As an app user, I want to have a log-out option, so that I can quit this app safely.	21.1 Design the high-fidelity prototype for the log-out process 21.2 Remove connection with the database and log out the current user 21.3 Finalize front-end development for the log-out process according to the prototype	1	GROUP 1	COMPLETED	22/09 /2023
		US022	As an app user, I want to have an initial log-in page, so that I can log in to my account.	22.1 Design the high-fidelity prototype for the Login page 22.2 Connect with databases and retrieve input account to log the user in 22.3 Finalize front-end development for the Log-in page	2	GROUP 1	COMPLETED	09/09 /2023

Acceptance Criteria

Acceptance criteria are relatively high-level and do not provide specific details about how to test each requirement. To better understand how a User Story is being accepted, please kindly refer to [User Story Review Workflow](#).

For more detailed, step-by-step instructions that describe how to verify a specific functionality, please kindly refer to [the Sprint 2 Test Plan](#).

Acceptance Status - [APPROVED](#) [UNDER REVIEW](#) [REJECTED](#)

Epic ID	Epic	User Story ID	Sprint Backlog User Story	Acceptance Tests	Reviewer	Acceptance Status
EP01	As an app user, I want data visualization and clear navigation , so that I have a good experience using the app.	US001	As an app user, I want to have an informative dashboard home page, so that I can choose to see my field's conditions straight away.	<input checked="" type="checkbox"/> The prototype should accurately represent the final dashboard's visual design. <input checked="" type="checkbox"/> It should include all essential elements for displaying field conditions. <input checked="" type="checkbox"/> The dashboard should display data specific to the user's account. <input checked="" type="checkbox"/> Data should be updated in real-time or at regular intervals. <input checked="" type="checkbox"/> The front end of the dashboard must be developed based on the approved prototype. <input checked="" type="checkbox"/> All interactive elements (e.g., buttons, menus) must be functional and user-friendly.	GROUP 2	APPROVED

	US002	As an elder user, I want to have a friendly interface with clear visuals and large buttons to easily get to each page so that I do not get lost in navigation.	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Design the app interface with a user-centric approach, prioritizing the needs of elderly users. <input checked="" type="checkbox"/> Use a larger font size and high-contrast colour schemes for improved readability. <input checked="" type="checkbox"/> Ensure that all visuals, including text and icons, are clear and easily distinguishable. <input checked="" type="checkbox"/> Create large, easily-tappable buttons and navigation elements to enhance ease of use. <input checked="" type="checkbox"/> Implement a straightforward and intuitive navigation structure to minimize the risk of users getting lost. 	GROUP 2	APPROVED	
EP02	As an app user, I want to register sensors into the farm remotely using the app so that it can be more convenient for me.	US006	As an app user, I want to register Gateways, so that I can allow my sensors to connect to them later.	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> The prototype should include all necessary elements for registering a Gateway. <input checked="" type="checkbox"/> New Gateway records should be successfully added to the database. <input checked="" type="checkbox"/> Ensure the form captures necessary gateway information, such as name, location, and unique identifiers. <input checked="" type="checkbox"/> Provide feedback to users upon successful and failed gateway registration. <input checked="" type="checkbox"/> Users should see Gateway data specific to their accounts. <input checked="" type="checkbox"/> The displayed data should be accurate and up-to-date. <input checked="" type="checkbox"/> The front end should match the high-fidelity prototype. <input checked="" type="checkbox"/> User interactions during Gateway registration should work seamlessly. 	GROUP 1	APPROVED
	US007	As an app user, I want to delete Gateways, so that I can remove unused Gateway resources.	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> The prototype should provide a clear and user-friendly way to delete Gateways. <input checked="" type="checkbox"/> The selected Gateway should be successfully retrieved from the database for deletion. <input checked="" type="checkbox"/> Implement a confirmation step to prevent accidental deletions. <input checked="" type="checkbox"/> Upon confirmation, delete the selected gateway data from the database. <input checked="" type="checkbox"/> Provide a success message to users upon successful and failed deletion. <input checked="" type="checkbox"/> The front end should match the high-fidelity prototype. <input checked="" type="checkbox"/> User interactions during Gateway deletion should work seamlessly 	GROUP 1	APPROVED	

			GROUP 1	APPROVED
US008	As an app user, I want to register new farms and fields, so that I can later select those fields I want my sensors installed.	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> The prototype should include all necessary elements for registering a farm/field. <input checked="" type="checkbox"/> New farm/field records should be successfully added to the database. <input checked="" type="checkbox"/> Ensure the form captures necessary farm /field information, such as name and location. <input checked="" type="checkbox"/> Provide feedback to users upon successful and failed farm/field registration. <input checked="" type="checkbox"/> Users should see farm /field data specific to their accounts. <input checked="" type="checkbox"/> The displayed data should be accurate and up-to-date. <input checked="" type="checkbox"/> The front end should match the high-fidelity prototype. <input checked="" type="checkbox"/> User interactions during farm/field registration should work seamlessly. 	GROUP 1	APPROVED
US009	As an app user, I want to delete farms or fields, so that I can remove those fields that are mistakenly registered or no longer need sensors.	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> The prototype should provide a clear and user-friendly way to delete farm/field. <input checked="" type="checkbox"/> The selected farm/field should be successfully retrieved from the database for deletion. <input checked="" type="checkbox"/> Implement a confirmation step to prevent accidental deletions. <input checked="" type="checkbox"/> Upon confirmation, delete the selected farm /field data from the database. <input checked="" type="checkbox"/> Provide a success message to users upon successful and failed deletion. <input checked="" type="checkbox"/> The front end should match the high-fidelity prototype. <input checked="" type="checkbox"/> User interactions during farm/field deletion should work seamlessly 	GROUP 1	APPROVED

EP03	As an app user, I want to manage sensors remotely using the app so that it can be convenient for me.	US012	As an app user, I want to create new Version 2 sensors in fields, so that I can expand my monitoring capabilities.	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> The prototype should include all the necessary elements for registering a Version 2 sensor. <input checked="" type="checkbox"/> New sensor records should be successfully linked to the selected field and added to the database. <input checked="" type="checkbox"/> Ensure the form captures necessary sensor information, such as ID and location. <input checked="" type="checkbox"/> Provide feedback to users upon successful and failed sensor registration. <input checked="" type="checkbox"/> The front end should match the high-fidelity prototype. <input checked="" type="checkbox"/> User interactions during Version 2 sensor registration should work seamlessly. 	GROUP 1	APPROVED
			US013 As an app user, I want to view and edit existing sensors, so that I can manage sensor details as needed.		GROUP 1	APPROVED
EP05	As an app user, I want a place to do user registration so that I can use more features of the tool.	US021	As an app user, I want to have a log-out option, so that I can quit this app safely.	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> The prototype should include all necessary elements for the log-out process. <input checked="" type="checkbox"/> Ensure users can easily access and use the log-out feature. <input checked="" type="checkbox"/> After logging out, users should be redirected to an appropriate screen (login screen). <input checked="" type="checkbox"/> Implement appropriate security measures to protect user data during and after the log-out process. <input checked="" type="checkbox"/> Ensure that the log-out functionality is easily accessible from the profile section of the app. <input checked="" type="checkbox"/> The front end should match the high-fidelity prototype. 	GROUP 2	APPROVED

			GROUP 2	APPROVED
<i>US022</i>	As an app user, I want to have an initial log-in page, so that I can log in to my account.	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Include all essential login elements such as username/email input, password input, and a login button. <input checked="" type="checkbox"/> Adhere to the app's style guide and branding. <input checked="" type="checkbox"/> Establish a connection from the login page to the database for user authentication. <input checked="" type="checkbox"/> Implement secure data transmission between the login page and the database. <input checked="" type="checkbox"/> Verify user credentials against database records during login attempts. <input checked="" type="checkbox"/> Handle authentication errors securely, displaying appropriate messages to users. <input checked="" type="checkbox"/> Develop the front end of the login page based on the approved prototype. <input checked="" type="checkbox"/> Create a seamless user experience, including feedback for successful or unsuccessful login attempts. 		

Sprint 3 Plan(22/09/2023 - 20/10/2023)

Subject to Change

This page presents a draft plan and user story mapping for Sprint 3. Finalized version will be discussed and created in the corresponding Sprint planning meeting.

Jira KANBAN Board Access

Please access the most recent [JIRA KANBAN Board here](#)

Sprint 3 Goal

1. Finalize **dashboard** details.
2. Finalize **Sensor Management** page functionalities.
3. Allow users to **download data reports**.
4. Allow **automatic alerts** for moisture, temperature, battery etc.
5. Build **Irrigation Zone Management** page.
6. Finalise **User Registration** functionalities.

Sprint 3 development work will be allocated to individuals: [Yunqing Yu](#) [Yilin Liu](#) [BOWEI Huang](#) @Jiakang Li and [YOU ZHOU](#)

Please refer to [Story Point Estimation Process here](#).

Status: IN PROGRESS COMPLETED DELAYED ABORTED

Epic ID	Epic	User Story ID	Sprint Backlog User Story	Story Points
EP01	As an app user, I want data visualization and clear navigation , so that I have a good experience using the app.	US003	As an app user, I want to have important data highlighted/ enlarged on the dashboard so that I can see the most useful data at first glance.	2
		US004	As an app user, I want to view Weather prediction, so that I can anticipate weather conditions for better planning.	3
		US005	As an app user, I want to see details of each sensor, so that I can access specific sensor information for monitoring.	3
EP03	As an app user, I want to manage sensors remotely using the app so that it can be convenient for me.	US011	As an app user, I want to download the report of data from my dashboard, so that I can conduct data analysis to discover trends and make more informed decisions about farm management.	3
		US014	As an app user, I want to delete sensors from the field, so that I can remove sensors no longer needed.	2
		US015	As an app user, I want to have customized alerts, so that I can take immediate action whenever needed.	3
EP04	As an app user, I want to manage my irrigation zones remotely using the app so that it can be convenient for me.	US016	As an app user, I want to create new irrigation zones, so that I can efficiently manage water distribution.	2
		US017	As an app user, I want to view and edit existing irrigation zones, so that I can adjust irrigation parameters as needed.	2
		US018	As an app user, I want to delete irrigation zones, so that I can remove unnecessary irrigation zones.	2
EP05	As an app user, I want a place to do user registration so that I can use more features of the tool.	US019	As an app user, I want to change my password, so that I can allow myself to be registered.	2
		US020	As an app user, I want to edit my profile, so that I can customize my profile.	2

Acceptance Criteria

Acceptance criteria are relatively high-level and do not provide specific details about how to test each requirement. To better understand how a User Story is being accepted, please kindly refer to [Functionality Review Workflow](#).

More detailed, step-by-step instructions that describe how to verify a specific functionality will be designed after the start of Sprint 3.

Epic ID	Epic	User Story ID	Sprint Backlog User Story	Acceptance Tests
EP01	As an app user, I want data visualization and clear navigation , so that I have a good experience using the app.	US003	As an app user, I want to have important data highlighted/ enlarged on the dashboard so that I can see the most useful data at first glance.	<ul style="list-style-type: none"> <input type="checkbox"/> Important data is visually distinguished, such as through larger fonts or color highlights on the dashboard. <input type="checkbox"/> Unimportant data are kept as normal font size and style. <input type="checkbox"/> All visuals, including text and icons, are clear and easily distinguishable. <input type="checkbox"/> Users can easily identify and understand the significance of the highlighted data at first glance.
			As an app user, I want to view Weather prediction, so that I can anticipate weather conditions for better planning.	<ul style="list-style-type: none"> <input type="checkbox"/> Users can see a weather prediction next to the details of the selected sensor data. <input type="checkbox"/> The weather prediction should provide accurate and up-to-date information. <input type="checkbox"/> Users can view forecasts for various timeframes (e.g., hourly, daily). <input type="checkbox"/> The weather information is presented in a clear and easily understandable format.
			As an app user, I want to see details of each sensor, so that I can access specific sensor information for monitoring.	<ul style="list-style-type: none"> <input type="checkbox"/> Users can access detailed information for each sensor by clicking the relevant button on dashboard. <input type="checkbox"/> Sensor details include key information such as temperature and moisture data. <input type="checkbox"/> User can select which information they want to see, such as battery and moisture graph. <input type="checkbox"/> Users can slide their screen to have a full view of the graphs. <input type="checkbox"/> Users can easily navigate between different sensors by clicking on the map to access their respective details.
EP03	As an app user, I want to manage sensors remotely using the app so that it can be convenient for me.	US011	As an app user, I want to download the report of data from my dashboard, so that I can conduct data analysis to discover trends and make more informed decisions about farm management.	<ul style="list-style-type: none"> <input type="checkbox"/> Download button should be clearly shown on the dashboard information page. <input type="checkbox"/> By clicking the download button, user can have the report downloaded to their phone locally. <input type="checkbox"/> Data reports are generated accurately with the correct data and format. <input type="checkbox"/> The downloaded data reports are suitable for data analysis (e.g., CSV or Excel). <input type="checkbox"/> Users receive a confirmation when the download is complete.

	US014	As an app user, I want to delete sensors from the field, so that I can remove sensors no longer needed.	<ul style="list-style-type: none"> <input type="checkbox"/> The prototype should provide a clear and user-friendly way to delete Version 2 sensors. <input type="checkbox"/> The selected Sensor should be successfully retrieved from the database for deletion. <input type="checkbox"/> Implement a confirmation step to prevent accidental deletions. <input type="checkbox"/> Upon confirmation, delete the selected Sensor data from the database. <input type="checkbox"/> Provide a success message to users upon successful and failed deletion. <input type="checkbox"/> The front-end should match the high-fidelity prototype. <input type="checkbox"/> User interactions during Sensor deletion should work seamlessly 	
	US015	As an app user, I want to have customized alerts, so that I can take immediate action whenever needed.	<ul style="list-style-type: none"> <input type="checkbox"/> Users can define their customized alerts easily using the application. <input type="checkbox"/> Alerts are triggered when the specified conditions are met, such as moisture and temperature over pre-defined threshold. <input type="checkbox"/> Users should receive notifications or alerts in real-time. <input type="checkbox"/> Users can easily modify or delete existing customized alerts. <input type="checkbox"/> User should be able to stop notification through system settings. 	
EP04	As an app user, I want to manage my irrigation zones remotely using the app so that it can be convenient for me.	US016	As an app user, I want to create new irrigation zones, so that I can efficiently manage water distribution.	<ul style="list-style-type: none"> <input type="checkbox"/> The prototype should include all necessary elements for registering an irrigation zone. <input type="checkbox"/> New irrigation zone records should be successfully added to the database. <input type="checkbox"/> Ensure the form captures necessary irrigation zone information, such as name and location. <input type="checkbox"/> Provide feedback to users upon successful and failed irrigation zone registration. <input type="checkbox"/> Users should see irrigation zone data specific to their accounts. <input type="checkbox"/> The displayed data should be accurate and up-to-date. <input type="checkbox"/> The front-end should match the high-fidelity prototype. <input type="checkbox"/> User interactions during irrigation zone registration should work seamlessly.
		US017	As an app user, I want to view and edit existing irrigation zones, so that I can adjust irrigation parameters as needed.	<ul style="list-style-type: none"> <input type="checkbox"/> The prototype should include all necessary elements for view and edit an irrigation zone. <input type="checkbox"/> The dashboard should display selected irrigation zone data. <input type="checkbox"/> Modified data should be updated in real-time. <input type="checkbox"/> Provide feedback to users upon successful and failed irrigation zone modification. <input type="checkbox"/> The front-end should match the high-fidelity prototype. <input type="checkbox"/> User interactions during irrigation zone viewing and editing should work seamlessly.

	<i>US018</i>	As an app user, I want to delete irrigation zones, so that I can remove unnecessary irrigation zones.	<ul style="list-style-type: none"> <input type="checkbox"/> The prototype should provide a clear and user-friendly way to delete irrigation zone. <input type="checkbox"/> The selected irrigation zone should be successfully retrieved from the database for deletion. <input type="checkbox"/> Implement a confirmation step to prevent accidental deletions. <input type="checkbox"/> Upon confirmation, delete the selected irrigation zone data from the database. <input type="checkbox"/> Provide a success message to users upon successful and failed deletion. <input type="checkbox"/> The front-end should match the high-fidelity prototype. <input type="checkbox"/> User interactions during irrigation zone deletion should work seamlessly 	
EP05	As an app user, I want a place to do user registration so that I can use more features of the tool.	<i>US019</i>	As an app user, I want to change my password, so that I can allow myself to be registered.	<ul style="list-style-type: none"> <input type="checkbox"/> The prototype should include all necessary elements for password changing process. <input type="checkbox"/> Include all essential login elements such as email input and password. <input type="checkbox"/> After password changed, users should be redirected to an appropriate screen (login screen). <input type="checkbox"/> Implement appropriate security measures to protect user data during and after the registration process. <input type="checkbox"/> Ensure that the registration functionality is easily accessible from login page of the app. <input type="checkbox"/> The front-end should match the high-fidelity prototype.
		<i>US020</i>	As an app user, I want to edit my profile, so that I can customize my profile.	<ul style="list-style-type: none"> <input type="checkbox"/> Include all essential profile elements such as email, phone number etc.. <input type="checkbox"/> Adhere to the app's style guide and branding. <input type="checkbox"/> Develop the front-end of the profile page based on the approved prototype. <input type="checkbox"/> Create a seamless user experience, show pop-up window to direct the user to web app for profile modification . <input type="checkbox"/> The front-end should match the high-fidelity prototype.

Project Progress

Weekly Development Workflow

Sprint 2 Development Workflow

Sprint 2 Burndown chart

Please access the Sprint 2 Burndown chart [here](#).



Weekly Development Workflow

This section records the project progress during Sprint 2 (2023/08/18 – 2023/09/22). The numbers in below tables represents the number of sub-tasks. For each status description, please kindly refer to [Jira - Workflow](#).

Sprint 2 development work is allocated to two groups to follow the [pair programming approach](#). As we have an uneven number of group members, GROUP 2 has three members but each two of them can still conduct pair programming:

GROUP 1 Yunqing Yu and Yilin Liu

GROUP 2 YOU ZHOU, @Jiakang Li and Bowei Huang

Week 5 (2023/09/15 - 2023/09/22)

Epic ID	User Story ID	To Do Tasks	In Progress	Blocked	In Review	Done
EP01	US001	0	0	0	0	3
	US002	0	0	0	0	3
EP02	US006	0	0	0	0	4
	US007	0	0	0	0	3
	US008	0	0	0	0	4
	US009	0	0	0	0	3
EP03	US012	0	0	0	0	3

	US013	0	0	0	0	3
EP05	US021	0	0	0	0	3
	US022	0	0	0	0	3
Total		0	0	0	0	32

Weekly Update:

Earlier this week, a code review meeting was organized for our development team (please refer to [this meeting](#)). The primary objective of this meeting was to collaboratively discuss any defects that had been observed within our GitHub artifacts prior to the meeting. It's worth noting that all identified defects were documented and subsequently rectified by the close of this week.

As we transitioned into the final week of the sprint, our focus shifted towards the completion of front-end development tasks, and our team completed these tasks with remarkable efficiency. Following this, a comprehensive testing and review process was conducted, leading to the announcement of the successful completion of [US001](#), [US002](#), [US009](#), [US012](#) and [US013](#).

During our [Sprint 2 Review \(Date 21/09/2023\)](#), we thoughtfully organized a product demonstration, allowing our clients to interact with our current product. This enabled us to gather feedback from our clients for further refinements and enhancements within the application. The feedback received has been overwhelmingly positive, proving our collective success in meeting the objectives set forth for Sprint 2.

Week 4 (2023/09/09 - 2023/09/15)

Epic ID	User Story ID	To Do Tasks	In Progress	Blocked	In Review	Done
EP01	US001	0	1	0	0	2
	US002	0	0	0	1	2
EP02	US006	0	0	0	0	4
	US007	0	0	0	0	3
	US008	0	0	0	0	4
	US009	0	1	0	0	2
EP03	US012	0	1	0	1	1
	US013	0	2	0	0	1
EP05	US021	0	0	0	0	3
	US022	0	0	0	0	3
Total		0	5	0	2	25

Weekly Update:

This week, our development efforts progressed exceptionally well. In [GROUP 1](#), we have successfully accomplished the tasks outlined in 1.3 and 2.3, along with the thorough review and validation of [US021](#) and [US022](#) (please check [Sprint 2 Test Plan](#) for test coverage). These tasks are now complete and are ready for release. Group 1 is still actively working on Task 1.2 while waiting for Task 2.2 to be reviewed (for a detailed task breakdown, kindly refer to [Sprint 2 Backlog](#)).

Simultaneously, in [GROUP 2](#), we successfully concluded the implementation and validation of [US006](#), [US007](#) and [US008](#). However, work is ongoing for tasks 9.3, 12.3, 13.2, and 13.3. Additionally, Task 12.2 is currently undergoing a review process to ensure its quality. Our teams continue to collaborate efficiently, consistently delivering tasks in advance of scheduled deadlines. As a result, we are highly optimistic about the timely completion of all tasks slated for Sprint 2.

Week 3 (2023/09/02 - 2023/09/08)

Epic ID	User Story ID	To Do Tasks	In Progress	Blocked	In Review	Done
EP01	US001	1	1	0	0	1
	US002	1	1	0	0	1
EP02	US006	1	2	0	0	1
	US007	2	0	0	0	1
	US008	1	2	0	0	1
	US009	2	0	0	0	1
EP03	US012	1	1	0	0	1

	US013	2	0	0	0	1
EP05	US021	0	1	0	1	1
	US022	0	1	0	0	2
	Total	11	9	0	1	11

Weekly Update:

During our client meeting this week, we presented the complete prototype for review and received positive feedback from the client (please refer to [this meeting](#) for details). Consequently, this review signifies the completion of tasks 1.1, 2.1, 6.1, 7.1, 8.1, 9.1, 12.1, 13.1, 21.1, and 22.1 (for a detailed task breakdown, kindly refer to [Sprint 2 Backlog](#)).

In parallel, [BOWEI HUANG](#) hosted a team meeting to set up the development environment, involving all team members (please refer to [this meeting](#) for details). Following the successful environment setup, every team member was able to commence work on their respective tasks. This collective effort propelled the progress of tasks 1.2, 2.3, 6.2, 6.3, 8.2, 8.3, and 12.2 and they are expected to be completed early next week to initialize other tasks (for a detailed task breakdown, kindly refer to [Sprint 2 Backlog](#)).

With the fully approved prototype, the team can also embark on the finalization of the front-end components for the log-in and log-out pages as these functionalities are fully implemented. Hence tasks 21.3 and 22.3 are included in the active development phase.

Week 2 (2023/08/26 - 2023/09/01)

Epic ID	User Story ID	To Do Tasks	In Progress	Blocked	In Review	Done
EP01	US001	2	0	0	1	0
	US002	2	0	0	1	0
EP02	US006	3	0	0	1	0
	US007	2	0	0	1	0
	US008	3	0	0	1	0
	US009	2	0	0	1	0
EP03	US012	2	0	0	1	0
	US013	2	0	0	1	0
EP05	US021	1	1	0	1	0
	US022	1	0	0	2	0
	Total	20	1	0	11	0

Weekly Update:

The implementation of the login functionality, Task 22.2, has been successfully passed to review status, marking the successful connection of the user account database. Consequently, our team now possesses the capability to access user accounts provided by the client. This initial codebase also holds significant importance for the project's future development. [GROUP 1](#) members have transitioned to commence work on the log-out feature, which brought Task 21.2 into progress.

Concurrently, the comprehensive interface prototype for the application has been crafted (kindly refer to [Prototypes](#) for detail) and is set for review by our client in the upcoming week. This critical step provides an opportunity for the client to assess and offer feedback on the user interface and design elements, ensuring alignment with their expectations and project objectives.

Additionally, the research and study of iOS and Swift development have been successfully completed. Our development team has acquired a solid understanding of these technologies, and are confident with using them for the upcoming development phase. With these preparations finalized, our development team will initiate the remaining tasks next week.

Week 1 (2023/08/18 - 2023/08/25)

Epic ID	User Story ID	To Do Tasks	In Progress	Blocked	In Review	Done
EP01	US001	2	1	0	0	0
	US002	2	1	0	0	0
EP02	US006	3	1	0	0	0
	US007	2	1	0	0	0
	US008	3	1	0	0	0
	US009	2	1	0	0	0

EP03	<i>US012</i>	2	1	0	0	0
	<i>US013</i>	2	1	0	0	0
EP05	<i>US021</i>	2	1	0	0	0
	<i>US022</i>	1	2	0	0	0
Total		21	11	0	0	0

Weekly Update:

Given the initial unfamiliarity with the crucial technologies for iOS applications, we collectively decided a research period was essential during the first week's [team meeting](#). This decision was also communicated to our client during our latest [client meeting](#). Therefore, most of development work are not progressed yet in week 1.

[Yunqing Yu](#) was responsible for crafting a comprehensive prototype that would encapsulate all interface aspects of the application, spanning tasks 1.1, 2.1, 6.1, 7.1, 8.1, 9.1, 12.1, 13.1, 21.1, and 22.1 (refer to [Sprint 2 Backlog](#) for task detail). In parallel, [Yilin Liu](#) started crafting the test plan for functionalities allocated to this sprint (kindly refer to [Sprint 2 Test Plan](#) for detail). Additionally, we recognized the importance of developing the app's login functionality, so Task 22.2 was initiated by [GROUP 1](#), as it serves as the entry point to the application's functionalities. Simultaneously, the remaining members of our development team started seeking tutorials to build up their knowledge and proficiency before undertaking the actual development tasks.

Development Environment

Subject to change

Due to our team's limited experience in iOS development, it's important to acknowledge that the current development environment is susceptible to adjustments and modifications. As we delve further into the intricacies of iOS app development and gain a deeper understanding of the platform, we may identify areas where refinements or updates are necessary.

Mobile Development Stack:

Category	Details
Mobile Platform	iOS
Programming Language	Swift 5.5
Development Environment	Xcode (latest version)

Backend Services:

Category	Details
Authentication	Amazon Cognito
Database Integration	Amazon RDS (PostgreSQL) or Amazon DynamoDB
Storage	Amazon S3
API Management	Amazon API Gateway

Database:

Category	Details
Database Management System	PostgreSQL 13

Mobile Application Development Tools and Frameworks:

Category	Details
User Interface	SwiftUI
User Authentication	Amazon Cognito SDK or OAuth libraries
Push Notifications	Apple Push Notification Services (APNs)

Required Packages and Libraries:

Package/Library	Purpose
Alamofire	Simplifies networking tasks and API communication
Charts	Provides customizable charts and graphs for data visualization
Amazon Cognito SDK	Facilitates user authentication and authorization
AWS SDK for iOS	Provides libraries for integrating with AWS services
UserNotifications	Manages push notifications and user alerts

Prerequisites

Before beginning, make sure to have the following prerequisites:

- A Mac computer running macOS (required for iOS development)
- Xcode: The integrated development environment (IDE) for iOS app development. Download Link: <https://developer.apple.com/xcode/resources/>

Steps to Set Up the Development Environment

1. Xcode Installation

Xcode serves as an essential tool for iOS app development. Users can obtain it from the Mac App Store or the Apple Developer website. After downloading, ensure installation and maintain the latest version for optimal performance.

2. Swift Language

Swift, the Apple-developed language for iOS app creation, comes integrated with Xcode. There's no separate installation required, streamlining the development process.

3. Git for Version Control

Git stands as a crucial version control solution for efficient collaboration and code management. If not already present, users should install Git to facilitate seamless team interactions.

4. Apple Developer Account

An Apple Developer account becomes essential for testing and deploying apps on real iOS devices and the App Store. For those without an account, enrollment in the Apple Developer Program is necessary.

5. Simulator and Device Testing

Xcode incorporates an in-built iOS simulator, enabling app testing across diverse device setups. Additionally, developers can assess apps on physical iOS devices connected to their Macs. The setup of provisioning profiles and certificates within Xcode facilitates device testing.

6. IDE Customization

Customize Xcode preferences to align with personal choices. Tweaking settings like code formatting, keyboard shortcuts, and editor themes enhances the overall development experience.

7. Project Organization

Maintain a structured project layout for enhanced clarity. Segregate app components into distinct folders, such as views, models, controllers, and resources. This systematic arrangement simplifies code management and scalability as the project evolves.

Product Demonstration

Subject to Change

This page presents the product demonstration for the latest release and will be finalized once all features are implemented.

Sprint 2 Demonstration

In Sprint 2, we focused on key functionalities, and we have completed the following:

1. **Farm and Field Management:** We have implemented robust features for farm and field management to streamline operations.
2. **Sensor Registration:** Our team has developed a seamless sensor registration process, ensuring that data collection is both efficient and accurate.
3. **Gateway Registration:** The gateway registration system is in place, enhancing the connectivity and data flow within the system.
4. **Login and Logout Functionality:** Secure login and logout features have been integrated, ensuring data confidentiality and user control.

Additionally, we have laid the foundation for the dashboard page by creating a template. While the template showcases our design and layout, please note that the complete dashboard functionality will be implemented in the next sprint.

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Ethical Analysis

Subject to Change

Our team will continuously check for any ethical issues aroused in the project, and new issues will be updated. Validations checklists will be updated at the end of the last release.

Please go through [Project Overview](#) and [User Persona](#) to have a better understanding of this section.

The ethical analysis follows the framework defined by the *Ethics-Aware SE Method*, and we have ensured the development team has satisfied the four enablers to adopt this method. Please refer to the original article '[A Roadmap for Ethics-Aware Software Engineering](#)' for a better understanding of enablers and each phase's definition.

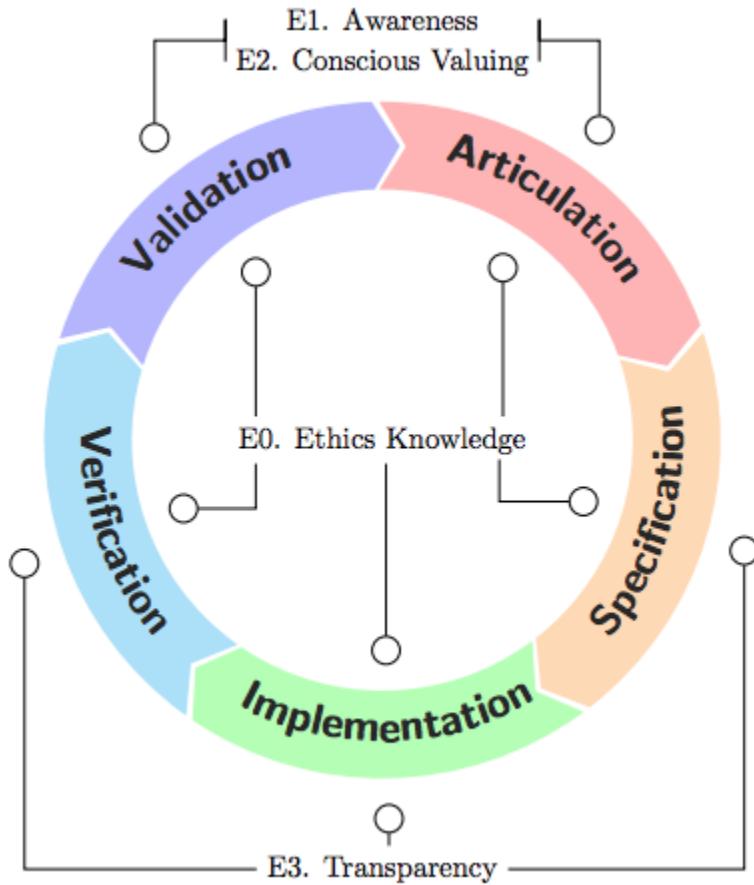


Figure: Method for Ethics-Aware Software Engineering Diagram

Due to the project limitations, we are restricted from contacting the actual end-users of the application. On the other hand, the ethics requirements are not specifically mentioned by our client during both designing and development phase. Hence, the ethical analysis and future validation will be mostly conducted within the development team along with communication with our client for all key decisions.

Articulation and Specification Phase

During Articulation and Specification phase, our team carefully analyzed the project requirement and investigates possible ethical values and issues embedded in it. We have extracted the ethical concerns for both the system itself and among the development team. The actual functional or quality requirement on relevant software artifacts and processes are also discussed for each ethical issue identified.

For System

Ethic Issue ID	Ethic Issue	Issue Analysis	Resulted Quality Requirement
EC01	Inclusivity & Accessibility	Based on the research conducted while creating User Persona , most farmers nowadays are over 50 years old, which may pose a ethical concern on the app's inclusivity and accessibility, as elder farmers may not be able to use the app as easy as the young farmers, or in the worst case, they do not even know how to install the app from Apple App Store. This issue is also mentioned by the client during the Date 17/08/2023 meeting.	Ensure that the mobile application is user-friendly and accessible to a wide range of users, including those with limited technical skills or older individuals.
EC02	Sustainability	According to Project Overview , this project is about retrieving data collected from the physical sensors installed in farms. This may result in an ethical concern about the product's sustainability and environmental impact. As the physical sensors will be directly inserted into the soil of the fields, it is important to ensure that the sensor would not cause negative impact on the soil ecosystem.	Ensure environmentally friendly materials are used for the sensors and ensuring they are designed for durability and longevity.
EC03	Privacy	According to the Prototypes , this app contains a profile page and each user holds their own account. Additionally, this app stores the phone number, address and email of users, while it can retrieve the data collected from the user's own farm fields, these may cause privacy breach issues.	User data should all be considered as private information and safely stored and used.
EC04	Transparency	Ethical concerns arise when collecting user data without clear consent or when using data for purposes beyond what users have agreed to. A consent for data collection may be needed to let the user know about how their data will be used and stored.	Clearly communicate to users the purposes for which their data will be collected and used.

For Development Team

Ethic Issue ID	Ethic Issue	Issue Analysis	Resulted Quality Requirement
EC05	Intellectual Property & Attribution	During development process, it is likely that our team would make use of some open-sourced resources. However, any usage of open-sourced resources used by the development team should be clarified in the project artifacts or indicated in code files, else it is possible to cause plagiarism issue.	Ensure that proper attribution and documentation are provided for each used open-sourced resources.
EC06	Honesty	The development team members may have actions or behaviors that could provide the client with inaccurate or deceptive information, potentially leading to misguided decisions or expectations. Every decision making about the app's development should be communicated among the team and with the client before actual implementation, and the result of discussion must be documented to ensure honesty regarding our client.	The development team should follow certain rules to ensure transparent and open communication with the client during the development process.
EC07	Confidentiality	The development team has access to the client's original development files, documents and third-party services throughout the project. It is necessary for all the development team members to keep the files safely and never share with anyone who is not part of this project team, else it may cause data breach and some legal actions.	Ensure strict access controls and data security measures to protect the client's original development files, documents, and third-party services.
EC08	Collaboration	The team may encounter disagreements or conflicts arise from differences in ethical values, principles, or beliefs among team members. These conflicts may impact decision-making and collaboration within the team.	Establish a clear conflict resolution process within the development team to ensure effective collaboration.

Action Plan Table

This table summarizes the plan made for Implementation and Validation Phase, including the resolve plan for each ethical issue and a checklist to validate how well our system aligns with its intended ethics requirements. Any deviations will be explained by the end of the actual Validation Phase.

Verification Phase planning is not specifically mentioned in the table. But our team will continuously check that the mobile application is being built according to the ethics specification.

	Ethic Issue ID	Ethical Issues Identified	Resulted Quality Requirement	Action Plan	Validation Checklist
System	EC01	Inclusivity and Accessibility	Ensure that the mobile application is user-friendly and accessible to a wide range of users, including those with limited technical skills or older individuals.	Craft a user guide specifically tailored to elder users to help them install and use the app after the last release. Provide a workflow diagram for users to understand the navigation of	<input type="checkbox"/> User guide is crafted and easy to follow. <input type="checkbox"/> Workflow diagram is effective in understanding how to use the mobile application.

	EC02	Sustainability	Ensure environmentally friendly materials are used for the sensors and ensuring they are designed for durability and longevity.	Confirm with client whether the sensor is using environmentally safe materials and do not harm the soil conditions.	<input type="checkbox"/> Consult with the client to assess potential environmental impacts and obtain approval for the sensor materials. <input type="checkbox"/> Ensure that the sensor design adheres to durability and longevity standards.
	EC03	Privacy	User data should all be considered as private information and safely stored and used.	<p>Employ robust encryption mechanisms to secure user data both in transit and at rest. For detailed implementation tools and method, please kindly refer to Cyber Security Analysis.</p> <p>Implement strict access controls and role-based permissions to restrict data access to authorized personnel only.</p>	<input type="checkbox"/> Conduct security testing to confirm that robust encryption mechanisms are effectively safeguarding user data. <input type="checkbox"/> Access controls and role-based permissions are correctly implemented.
	EC04	Transparency	Clearly communicate to users the purposes for which their data will be collected and used.	Ask for a consent from users for data collection and usage, providing options for consent. Clearly show them why their data is being collected and how it will be used.	<input type="checkbox"/> The app requests user consent for data collection and clearly explains the reasons for data collection. <input type="checkbox"/> Users have options for granting or denying consent.
Development Team	EC05	<i>Intellectual Property and Attribution</i>	Ensure that proper attribution and documentation are provided for each used open-sourced resources.	Keep a record of all open-sourced resources used during the development process. Conduct a review process if required to confirm that there are no instances of plagiarism.	<input type="checkbox"/> Maintain a detailed record of all open-sourced resources used in the project. <input type="checkbox"/> Reviews are organized by the development team to confirm that all open-source usage is appropriately attributed. <input type="checkbox"/> Internal plagiarism checks are held if necessary.
	EC06	<i>Potentially Misleading the Client</i>	The development team should follow certain rules to ensure transparent and open communication with the client during the development process.	<p>Maintain open and transparent communication with the client regarding project progress, challenges, and risks.</p> <p>Document all project decisions, discussions, and agreements to provide an accurate record of project activities.</p>	<input type="checkbox"/> Ensure project documentation contains comprehensive records of project decisions, discussions, and agreements. <input type="checkbox"/> Confirm that regular updates are provided to the client as agreed upon.
	EC07	<i>Confidentiality</i>	Ensure strict access controls and data security measures to protect the client's original development files, documents, and third-party services.	<p>A Code of Conduct is signed at the start of the project before the project files are sent to the development team.</p> <p>Implement a data retention policy that defines how long client data will be stored and under what conditions it will be securely disposed of when no longer needed.</p> <p>(Please kindly refer to Team Commitment for detail)</p>	<input type="checkbox"/> Ensure that a signed Code of Conduct is in place and that all team members adhere to it. <input type="checkbox"/> Implement and enforce data retention policies in Team Commitment .
	EC01	<i>Value Conflicts</i>	Establish a clear conflict resolution process within the development team.	<p>Establish clear conflict resolution mechanisms within the team, such as open dialogue or involvement of team leads.</p> <p>Develop and enforce a code of conduct that outlines expected behavior and professionalism within the team.</p> <p>(Please kindly refer to Team Commitment for detail)</p>	<input type="checkbox"/> Confirm that conflict resolution mechanisms are documented in Team Commitment and agreed by all team members. <input type="checkbox"/> Conflicts among the team, if any, are resolved in accordance to the Team Commitment terms.

Cyber Security Analysis

Subject to Change

Due to limited knowledge on cyber security toolkits and architecture design, only an initial plan is provided in this section. Updated version will be provided in Sprint 3.

Potential Threat Modeling

The mobile application uses AWS services and PostgreSQL for data storage, and all the data can be retrieved using API URLs provided by the client. This may potentially cause cyber security issues in three categories: (1) Authentication and Authorization, (2) Data Protection, (3) Third-Party Integrations.

⚠️ Authentication and Authorization

According to [client meeting](#), the user accounts are created solely by the IT team on the client side, therefore users cannot freely register their own account which mitigates the risk of unauthorized creation of user accounts. However, this also means our team has limited control over user account creation process. Hence, it is assumed that the client's IT team will take the responsibility of auditing user accounts.

Our team can still work on the password complexity. As the mobile application requires the correct password to log-in to the user's farm management dashboard, a strong password is required when users are trying to change the password when they receive their newly created account. As an easy and guessable password is susceptible to [brute-force attacks](#), where attackers repeatedly attempt to guess the password until successful. This can lead to unauthorized access to accounts. Moreover, a multi-factor authentication may also enhance the security of user accounts.

⚠️ Data Protection

Our mobile application retrieves data from the database using URLs to access an API, which means it does not have direct access to or edit permissions on the original database. While this approach may provide an additional layer of security by restricting direct database access, it can introduce potential issues related to API security and data transmission. Depending on how the API is designed and secured, it may be vulnerable to unauthorized access, API attacks (e.g. [SQL injection](#)), or data manipulation. However, due to project limitation, our team do not have direct access and edit permission on the original API, which restricted us on implementing safety measures on API security.

However, the transmission of data can still be managed by our team. Data transmitted between the application and the database might be intercepted by malicious actors if proper encryption and security measures are not in place. As the data includes sensitive information such as address, email address and phone number, data breach would also lead to privacy violations. Hence the data transmitted between the application and database should be encrypted.

⚠️ Secure Third-Party Integrations

As we utilize AWS services for user account and sensor data storage, we need to consider the security of this integration. Relying on these AWS services implies a dependency on a third-party provider for critical data storage and management, which may introduce risks related to service availability, data security, and compliance. On the other hand, data resilience and backups are also essential security measures to mitigate potential cloud service blackouts.

Cyber Security Analysis Table

According to the threat modeling, the cyber security analysis table is provided along with the mitigation plan. The team measured:

- **Likelihood** in five categories: (1) Rare; (2) Unlikely; (3) Possible; (4) Likely; and (5) Almost Certain.
- **Impact** in five categories: (1) No impact; (2) Minimal; (3) Moderate; (4) High; and (5) Severe.
- **Priority** in three categories: (1) Low; (2) Medium, (3) High

Security Threat ID	Security Threat	Description	Likelihood	Impact	Priority	Mitigation Plan
ST01	Insecure Data Transmission	Data transmitted between the application and the database is vulnerable to interception without encryption. Any unauthorized changes or tampering with the data, whether during transmission or storage, could lead to incorrect farming decisions.	Possible	Severe	High	Implement strong encryption for data transmitted between the application and the database. CryptoKit with SHA256 and AES encryption may be used as the data security toolkit.
ST02	Weak Passwords and Bruteforce Attacks	Weak passwords and the potential for brute-force attacks can lead to unauthorized access to accounts.	Possible	Severe	High	Enforce strong password policies and educate users on password security. At least 8 digits password is required before users can register themselves into the application.

ST03	Inadequate Authentication	Applications with weakly implemented authentication mechanisms may be susceptible to unauthorized access.	Unlikely	High	Medium	Integrate Microsoft Authenticator, Google Authenticator or other authenticators to enable 2FA authentication during user log-in process to enhance account security.
ST04	Unauthorized User Account Creation	Risk of unauthorized creation of user accounts due to limited control over the client-side IT team's account creation process.	Unlikely	High	Low	As we do not have access to user account creation process, we would collaborate with the client's IT team to ensure a clear account creation procedures instead of implementing extra functionalities.
ST05	Third-Party Integration Risks	The reliance on AWS services introduces risks related to service availability, data security, and compliance.	Rare	Severe	Low	It is very unlikely that AWS can cause security issues given its strong internal security protection and a number of data centers around the world. As we do not have much access to the security services provided by AWS, we will not implement extra functionalities on this.

Quality Assurance

Quality Assurance Workflow

Sprint 2 Test Plan

Quality Assurance Workflow

Subject to Change

This section presents the initial plan on application testing process during development process. Further changes may be applied when the development team creates extra testing scripts.

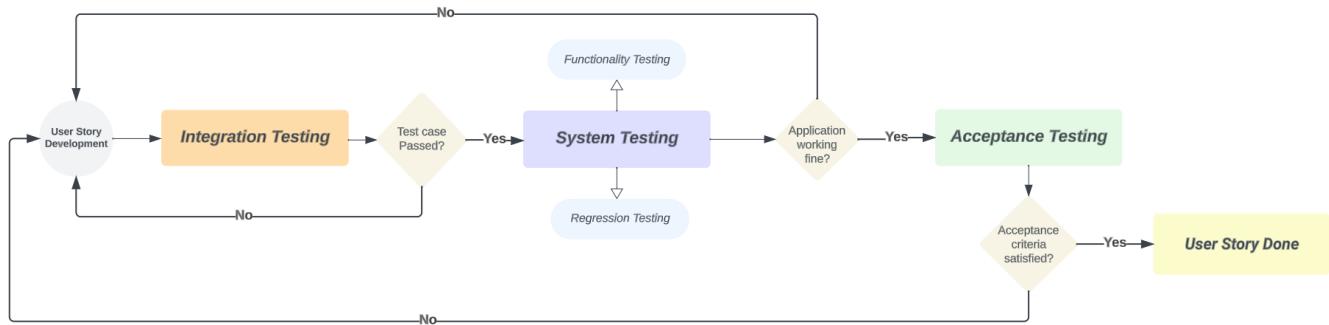


Figure: Quality Assurance Workflow diagram

Test Plan Explanation

Although our team is aware of the importance of unit testing during the testing phase, we are limited by our technical knowledge and experience in writing unit test scripts. Consequently, unit tests are postponed until the development team has acquired sufficient familiarity with writing test scripts. For Sprint 2, the testing process is primarily conducted manually, with the details included in the test plan (please refer to [Sprint 2 Test Plan](#) as an example).

Integration Testing

Integration testing is performed whenever a user story is completed and is carried out by the assigned team member who is not the author of the feature. During this process, we use the [black box method](#), in which testers interact with the user interface to assess the functionality of a single user story or feature. This involves actions such as clicking on buttons, scrolling, and swiping. Testers are not required to understand how the code works or consider the backend components at this stage. If multiple features are involved in a user story, testers will examine the integration between these features. For example, to test the deletion of registered sensors, we may first perform a sensor registration and then proceed with the deletion to evaluate both the functionality and the integration between these features.

System Testing

System testing examines every component of an application to make sure that they work as a complete and unified whole. This process happens when every a new user story is being added into the application, but different from integration testing, we are testing the whole application instead of partially. This involves two different types of tests:

- **Functionality Testing:** Check whether the new features are still working after adding into the application, including checking the expected changes in databases.
- **Regression Testing:** Check whether previously completed features are still working fine with the newly added user story features.

Acceptance Testing

Although acceptance testing requires end-users' involvement, due to project limitations we are not able to satisfy this need. Hence the acceptance testing are also done within the development team by the assigned reviewers according to acceptance criteria documented in Sprint backlogs (example shown in [Sprint 2 Plan\(18/08/2023 - 22/09/2023\)](#)).

Sprint 2 Test Plan

This test plan represents part of the review process. For acceptance tests and review outcome of specific functionality, please kindly refer to the [Acceptance Criteria](#) under Sprint 2 Backlog.

For actions regarding different outcomes of testing process, please kindly refer to the [Quality Assurance Workflow](#).

Testing is conducted as a group unit in Sprint 2.

GROUP 1 Yunqing Yu and Yilin Liu

GROUP 2 YOU ZHOU, Jiakang LI and Bowei Huang

i For integration Testing:

- Only edit the status of test cases related to the current user stories that are under review.

For System Testing:

- Review all previously executed test cases along with the current user stories that are under review.

Test Status - PASSED TESTING FAILED

Relevant Epic ID	Relevant User Story	Test Case ID	Test Case Description	Test Steps	Expected Result	Tester	Status
EP01	US001	TC01	Empty dashboard page when not selecting sensor	1. Login with valid user account 2. Do not select sensor in dashboard page, ensure the correct message is displayed	"No Sensor Data. Please go to "Management" to check all your configurations." message should be seen along with a map on the right hand side.	GROUP 2	PASSED
		TC02	Show correct data on dashboard page when sensor is selected	1. Login with valid user account 2. Select a farm from dropdown. 3. Select a field from dropdown. 4. Select a sensor from dropdown. 5. Ensure the correct table of data displayed	Time, Moisture, Temperature, Battery, Sensor ID and Alias data should match the selected sensor.	GROUP 2	PASSED
	US002	TC03	Navigation bar should pass to correct pages	1. Login with valid user account 2. Click each button on the navigation bar at the bottom	Left most button should lead to dashboard page. Middle button should lead to Management page. Right most button should lead to User Profile page.	GROUP 2	PASSED

		TC04	Management page navigation should pass to correct pages	<ol style="list-style-type: none"> 1. Login with valid user account 2. Click middle button on the navigation bar at the bottom 3. Click each button shown on the Management Page 	<p>'Gateway' button should lead to Gateway page.</p> <p>'Farm' button should lead to Farm/Field page.</p> <p>'Sensor' button should lead to Sensor page.</p> <p>'Irrigation Zone' button should lead to Irrigation Zone page.</p>	GROUP 2	PASSED
EP02	US006	TC05	Gateway should not be registered without an ID.	<ol style="list-style-type: none"> 1. Login with valid user account 2. On Management Page, navigate to 'My Gateways' 3. Click 'Add Gateway' 4. Click 'Next' without entering Gateway ID 	'Next' button should not respond without an Gateway ID input.	GROUP 1	PASSED
		TC06	Gateway cannot be registered without a location.	<ol style="list-style-type: none"> 1. Login with valid user account 2. On Management Page, navigate to 'My Gateways' 3. Click 'Add Gateway' 4. Click 'Next' with a Gateway ID 5. Click 'Next' without choosing location on the map 	'Next' button should not respond without an Gateway location indicated.	GROUP 1	PASSED
		TC07	Gateway can be registered with an ID and a location.	<ol style="list-style-type: none"> 1. Login with valid user account 2. On Management Page, navigate to 'My Gateways' 3. Click 'Add Gateway' 4. Click 'Next' with a Gateway ID 5. Click 'Next' and add the Gateway location on map 6. Click 'Next' and then 'Submit' 	After submission it will automatically return to 'My Gateways' page. The new gateway should be displayed with the correct Gateway ID and can be retrieved from relevant database.	GROUP 1	PASSED
	US007	TC08	Gateway deletion should show the user a double check pop-up window.	<ol style="list-style-type: none"> 1. Login with valid user account 2. On Management Page, navigate to 'My Gateways' 3. Click a red cross mark button next to a gateway ID 	A pop-up window asking for gateway deletion confirmation should appear.	GROUP 1	PASSED

	TC09	Gateway deletion should be aborted if choose 'Cancel' on the deletion pop-up window.	<ol style="list-style-type: none"> 1. Login with valid user account 2. On Management Page, navigate to 'My Gateways' 3. Click a red cross mark button next to a gateway ID 4. Choose 'Cancel' on the pop-up window 	Nothing happens on 'My Gateways' page as the deletion is aborted.	GROUP 1	PASSED
	TC10	Gateway should be deleted if choose 'Delete' on the deletion pop-up window.	<ol style="list-style-type: none"> 1. Login with valid user account 2. On Management Page, navigate to 'My Gateways' 3. Click a red cross mark button next to a gateway ID 4. Choose 'Delete' on the pop-up window 	The corresponding gateway should disappear from 'My Gateways' page and removed from relevant database.	GROUP 1	PASSED
<i>US008</i>	TC11	Farm and fields cannot be registered without a farm name and field name.	<ol style="list-style-type: none"> 1. Login with valid user account 2. On Management Page, navigate to 'My Farms & Fields' 3. Click 'Add New Field' 4. Click 'Next' without entering Farm Name and Field Name 	'Next' button should not respond without the two names.	GROUP 1	PASSED
	TC12	Farm and fields cannot be registered without a location.	<ol style="list-style-type: none"> 1. Login with valid user account 2. On Management Page, navigate to 'My Farms & Fields' 3. Click 'Add New Field' 4. Click 'Next' after entering Farm Name and Field Name 5. Click 'Next' without choosing location on the map 	'Next' button should not respond without the field location.	GROUP 1	PASSED

	TC13	New Farm & Fields can be registered if names and location are indicated.	<ol style="list-style-type: none"> 1. Login with valid user account 2. On Management Page, navigate to 'My Farms & Fields' 3. Click 'Add New Field' 4. Click 'Next' after entering Farm Name and Field Name 5. Click 'Next' and add the field location on map 6. Click 'Next' and then 'Submit' 	<p>After submission it will automatically return to 'My Farms & Fields' page.</p> <p>The new field should be displayed with the correct Field Name can be retrieved from relevant database.</p> <p>If new farm was created, after changing the view to that farm, the new field should appear on the page with the correct Field Name .</p>	GROUP 1	PASSED
US009	TC14	Field deletion should show the user a double check pop-up window.	<ol style="list-style-type: none"> 1. Login with valid user account 2. On Management Page, navigate to 'My Farms & Fields' 3. Click a red cross mark button next to a field name 	A pop-up window asking for field deletion confirmation should appear.	GROUP 1	PASSED
	TC15	Farm deletion should show the user a double check pop-up window.	<ol style="list-style-type: none"> 1. Login with valid user account 2. On Management Page, navigate to 'My Farms & Fields' 3. Click 'Delete' next to the current farm name 	A pop-up window asking for farm deletion confirmation should appear.	GROUP 1	PASSED
	TC16	Field/Farm deletion should be aborted if choose 'Cancel' on the deletion pop-up window.	<ol style="list-style-type: none"> 1. Login with valid user account 2. On Management Page, navigate to 'My Farms & Fields' 3. Click a red cross mark button next to a field name or. Click 'Delete' next to the current farm name 4. Choose 'Cancel' on the pop-up window 	Nothing happens on 'My Farms & Fields' page as the deletion is aborted.	GROUP 1	PASSED

		TC17	Field/Farm should be deleted if choose 'Delete' on the deletion pop-up window.	<ol style="list-style-type: none"> 1. Login with valid user account 2. On Management Page, navigate to 'My Farms & Fields' 3. Click a red cross mark button next to a field name or. Click 'Delete' next to the current farm name 4. Choose 'Delete' on the pop-up window 	The corresponding gateway should disappear from 'My Farms & Fields' page and removed from relevant database.	GROUP 1	PASSED
EP03	US012	TC18	Version 2 sensors cannot be registered without a sensor ID.	<ol style="list-style-type: none"> 1. Login with valid user account 2. On Management Page, navigate to 'My Sensors' 3. Click 'Add New Field' 4. Click 'Next' without entering Sensor ID 	'Next' button should not respond without a sensor ID.	GROUP 1	PASSED
		TC19	Version 2 sensors cannot be registered without a location indicated.	<ol style="list-style-type: none"> 1. Login with valid user account 2. On Management Page, navigate to 'My Sensors' 3. Click 'Add New Sensor' 4. Click 'Next' without entering a location on map 	'Next' button should not respond without a sensor location indicated.	GROUP 1	PASSED
		TC20	Version 2 sensors can be registered with ID and location indicated.	<ol style="list-style-type: none"> 1. Login with valid user account 2. On Management Page, navigate to 'My Sensors' 3. Click 'Add New Sensor' 4. Click 'Next' after entering SensorID 5. Click 'Next' and add the sensor location on map 6. Click 'Next' and then 'Submit' 	After submission it will automatically return to 'My Sensors' page. The new Version 2 sensor should be displayed with the correct Sensor ID in the current field's sensor table and can be retrieved from relevant database.	GROUP 1	PASSED

	US013	TC21	Version 2 sensors information and location can be viewed edited.	<ol style="list-style-type: none"> 1. Login with valid user account 2. On Management Page, navigate to 'My Sensors' 3. Click the green pencil button 4. Change any of the following: Alias, Latitude, Longitude, Sleeping Time (hr) 5. Click 'Next', change the location of sensor on map by clicking another position 6. Click 'Next' and then 'Submit' 	After submission it will automatically return to 'My Sensors' page. The edited Version 2 sensor should be displayed with the correct Sensor ID in the current field's sensor table, by clicking the green pencil button of that sensor again, the new information should be updated and can be retrieved from relevant database.	GROUP 1	PASSED
EP05	US021	TC22	After logging out, the user should be directed to login page.	<ol style="list-style-type: none"> 1. Login with valid user account 2. Click log-out from the top right corner dropdown 	Log-out should directly lead to the log-in page.	GROUP 2	PASSED
	US022	TC23	Invalid password or username should log the user into the app.	<ol style="list-style-type: none"> 1. Login with invalid user account 2. Click 'Login' 	A warning message indicating incorrect input should be shown.	GROUP 2	PASSED
		TC24	Correct username and password should log the user in.	<ol style="list-style-type: none"> 1. Login with valid user account 2. Click 'Login' 	After logging in the user should be directed to 'Dashboard' page.	GROUP 2	PASSED

Development Guidelines

[Jira - Card Structure](#)

[Jira - Workflow](#)

[Prioritization Method](#)

[Story Point Estimation](#)

[Team Commitment](#)

Team Commitment

Please read through this page and check 'Agree' before starting any tasks in the project.

As members of the AQ-Redback team, we commit to upholding the highest standards of professionalism, ethical conduct, and teamwork throughout the course of this project. Our collective commitment includes the following key principles:

1. Data Retention and Security

- We will implement a data retention policy that clearly defines how long client data will be stored and the conditions under which it will be securely disposed of when no longer needed.
- Data security will be a top priority, and we will adhere to best practices to protect client data from unauthorized access or breaches.

2. Conflict Resolution

- We will establish clear conflict resolution mechanisms within the team to address any disagreements, disputes, or conflicts that may arise during the project.
- Open and respectful dialogue will be encouraged, and we will explore mediation or involve team leads when necessary to resolve conflicts in a constructive manner.

3. Code of Conduct

- We will develop and adhere to a comprehensive code of conduct that outlines expected behavior, professionalism, and ethical standards within the team.
- The code of conduct will serve as a guiding document to foster a positive and inclusive work environment.

4. Respect for Diversity

- We recognize the value of diverse perspectives and backgrounds within our team and commit to respecting and embracing these differences.
- We will actively seek input and contributions from all team members to promote creativity and innovation.

5. Communication and Transparency

- We will maintain open and transparent communication channels to ensure that team members and our valued clients are well-informed about project progress, challenges, and decisions.
- Regular updates, meetings, and documentation will be utilized to keep everyone in the loop.

6. Accountability

- Each team member will be accountable for their responsibilities and commitments to the project.
- We will work collaboratively, provide support when needed, and hold ourselves and others accountable for meeting project goals and deadlines.

7. Continuous Learning and Improvement

- We will foster a culture of continuous learning and improvement, encouraging team members to stay updated on industry best practices and technologies.
- Feedback and lessons learned will be actively incorporated into our development processes.

By collectively committing to these principles, we aim to create a collaborative, ethical, and productive work environment that not only achieves project success but also upholds the highest standards of professionalism and teamwork.

Please tick 'Agree' if you accept all the above rules, or 'Refuse' if you do not.

Team Member	Status
Yunqing Yu	<input checked="" type="checkbox"/> Agree <input type="checkbox"/> Refuse
Yilin Liu	<input checked="" type="checkbox"/> Agree <input type="checkbox"/> Refuse
Bowei Huang	<input checked="" type="checkbox"/> Agree <input type="checkbox"/> Refuse

You Zhou	<input checked="" type="checkbox"/> Agree <input type="checkbox"/> Refuse
Jiakang Li	<input checked="" type="checkbox"/> Agree <input type="checkbox"/> Refuse

Story Point Estimation

Story Points Calculation Process

The story point system our team chose is **Fibonacci sequences (1,2,3,5,8)** and we were using **Magic Estimation** on Jira to calculate the story points for all user stories.

The Estimation Process Follows:

1. Initially Yunqing (PO) explained each of the requirements in detail and provided clarification to avoid confusion and misunderstanding and ensure every team member has a common understanding of the tasks.
2. Our team listed out all the user stories that needed to be assigned.
3. Our team roughly ordered all the user stories on a scale from "Smallest Efforts" to "Biggest Efforts"
4. Then, each team member had access to the estimation table, the first column representing story points (1,2,3,5,8..). Yilin (SM) reads out the user story and any relevant details and each of our team members selects a story point accordingly and reveals the point they selected once everyone completes the selection.
5. If we encounter a wide range of estimates, we dive into factors like complexity, technical challenges and unknowns and re-evaluate as a group. The final agreed-upon estimate becomes the story point value for that user story and continues this process until each story has a story point.

For User Story details, please kindly refer to [Product backlog](#).

Access to our [Story Point Estimation Whiteboard](#)

Estimation Process:

PRODUCT BACKLOG

<p>US001: As an app user, I want to have an informative dashboard home page, so that I can choose to see my field's conditions straight away.</p> <p>Description <input checked="" type="checkbox"/> = In Pro <input type="checkbox"/> Data visualisatio KAN-24 KAN-18 YY</p>	<p>US009: As an app user, I want to delete farms or fields, so that I can remove those fields that are mistakenly registered or no longer need sensors.</p> <p>Description <input checked="" type="checkbox"/> = In Pro <input type="checkbox"/> Sensor Reg KAN-41 KAN-32 YZ</p>	<p>US017: As an app user, I want to view and edit existing irrigation zones, so that I can adjust irrigation parameters as needed.</p> <p>Description <input checked="" type="checkbox"/> = Back <input type="checkbox"/> Irrigation Zone KAN-43 KAN-38</p>
<p>US002: As an elder user I want to have a friendly interface with clear visuals and large buttons to easily get to each page, so that I do not get lost in navigation.</p> <p>Description <input checked="" type="checkbox"/> = In Pro <input type="checkbox"/> Data visualisatio KAN-24 KAN-16 YL</p>	<p>US010: As an app user, I want to register Version 1 physical sensors with selected fields, so that I can later check my field's data from the paired sensor.</p> <p>Description <input checked="" type="checkbox"/> = In Pro <input type="checkbox"/> Sensor Reg KAN-41 KAN-33 BH</p>	<p>US018: As an app user, I want to delete irrigation zones, so that I can remove unnecessary irrigation zones.</p> <p>Description <input checked="" type="checkbox"/> = Back <input type="checkbox"/> Irrigation Zone KAN-43 KAN-39</p>
<p>US003: As an app user I want to have important data highlighted/ enlarged on the dashboard, so that I can see the most useful data at the first glance.</p> <p>Description <input checked="" type="checkbox"/> = Back <input type="checkbox"/> Data visualisation KAN-24 KAN-17</p>	<p>US011: As an app user, I want to download the report of data from my dashboard, so that I can conduct data analysis to discover trends and make more informed decisions about farm management.</p> <p>Description <input checked="" type="checkbox"/> = Back <input type="checkbox"/> Sensor Manage KAN-42 KAN-19</p>	<p>US019: As an app user, I want to change my password, so that I can allow myself to be registered.</p> <p>Description <input checked="" type="checkbox"/> = Back <input type="checkbox"/> User registr KAN-26 KAN-20</p>
<p>US004: As an app user, I want to view Weather prediction, so that I can anticipate weather conditions for better planning.</p> <p>Description <input checked="" type="checkbox"/> = Back <input type="checkbox"/> Data visualisatio KAN-24 KAN-27</p>	<p>US012: As an app user, I want to create new sensors in fields, so that I can expand my monitoring capabilities.</p> <p>Description <input checked="" type="checkbox"/> = In Pro <input type="checkbox"/> Sensor Man KAN-42 KAN-34 BH</p>	<p>US020: As a app user, I want to edit my profile, so that I can customize my profile.</p> <p>Description <input checked="" type="checkbox"/> = Back <input type="checkbox"/> User registr KAN-26 KAN-21</p>
<p>US005: As an app user, I want to see details of each sensor, so that I can access specific sensor information for monitoring.</p> <p>Description <input checked="" type="checkbox"/> = Back <input type="checkbox"/> Data visualisatio KAN-24 KAN-28</p>	<p>US013: As an app user, I want to view and edit existing sensors, so that I can manager sensor details as needed.</p> <p>Description <input checked="" type="checkbox"/> = In Pro <input type="checkbox"/> Sensor Man KAN-42 KAN-35 BH</p>	<p>US021: As an app user, I want have a log-out option, so that I can quit this app safely.</p> <p>Description <input checked="" type="checkbox"/> = In Pro <input type="checkbox"/> User registr KAN-26 KAN-22 YY</p>
<p>US006: As an app user, I want to register Gateways, so that I can allow my sensors to connect to them later.</p> <p>Description <input checked="" type="checkbox"/> = In Pro <input type="checkbox"/> Sensor Reg KAN-41 KAN-29 Y</p>	<p>US014: As an app user, I want to delete sensors from the field, so that I can remove sensors no longer needed.</p> <p>Description <input checked="" type="checkbox"/> = Back <input type="checkbox"/> Sensor Manage KAN-42 KAN-36</p>	<p>US022: As an app user, I want to have an initial log-in page, so that I can log in to my account.</p> <p>Description <input checked="" type="checkbox"/> = Done <input type="checkbox"/> User registr KAN-26 KAN-23 W</p>
<p>US007: As an app user, I want to delete Gateways, so that I can remove unused Gateway resources.</p> <p>Description <input checked="" type="checkbox"/> = In Pro <input type="checkbox"/> Sensor Reg KAN-41 KAN-30 Y</p>	<p>US015: As an app user, I want to have customized alerts, so that I can take immediate action whenever needed.</p> <p>Description <input checked="" type="checkbox"/> = Back <input type="checkbox"/> Sensor Manage KAN-42 KAN-18</p>	
<p>US008: As an app user, I want to register new farms and fields, so that I can later select those fields I want my sensors installed.</p> <p>Description <input checked="" type="checkbox"/> = In Pro <input type="checkbox"/> Sensor Reg KAN-41 KAN-31 YZ</p>	<p>US016: As an app user, I want to create new irrigation zones, so that I can efficiently manage water distribution.</p> <p>Description <input checked="" type="checkbox"/> = Back <input type="checkbox"/> Irrigation Zone KAN-43 KAN-37</p>	

Figure: Select the use stories for estimation

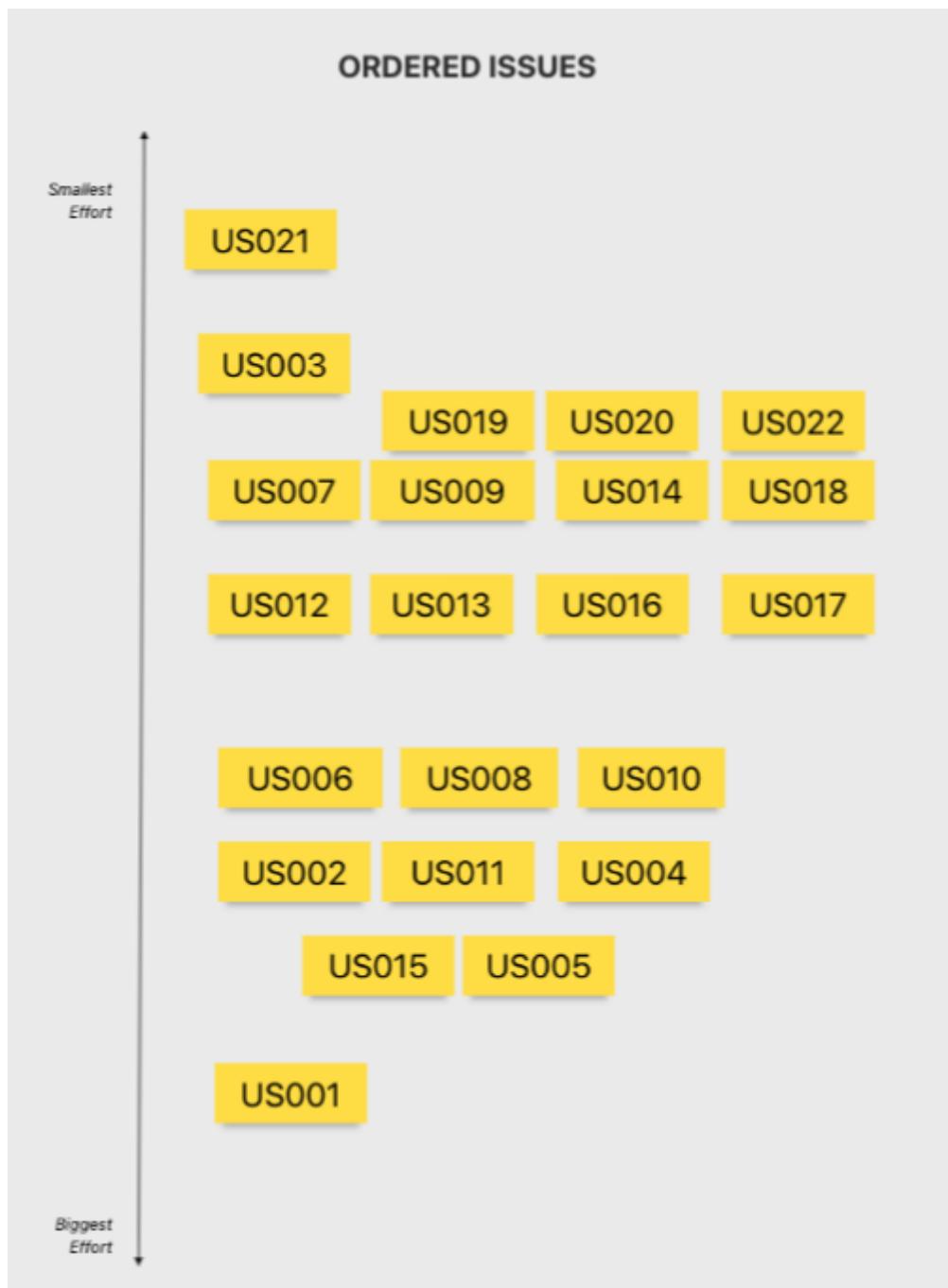


Figure: Rough ordering of the user stories

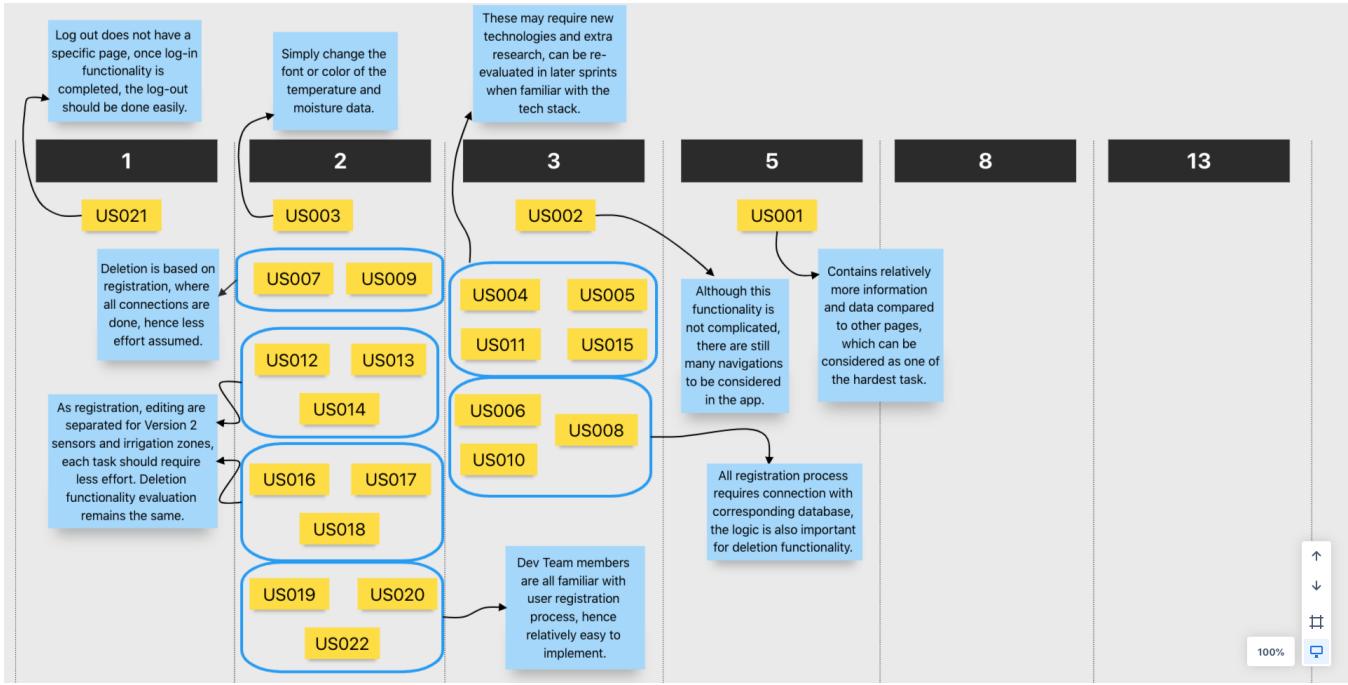


Figure: Final Story Point Estimation Results

Prioritization Method

The Prioritization Method Follows:

1. Based on the result of [Story Point Estimation](#), our team roughly discussed the importance and urgency for each user story, and created a graph to put each user story into a suitable place.
2. The Scrum Master (Yilin Liu) explained [MoSCoW Prioritization](#) to the team and ensured everyone had a solid understanding of the concept.
3. Based on the result from Step 1, our team put each user story into the suitable category of MoSCoW Prioritization based on careful discussion.

Initial prioritization

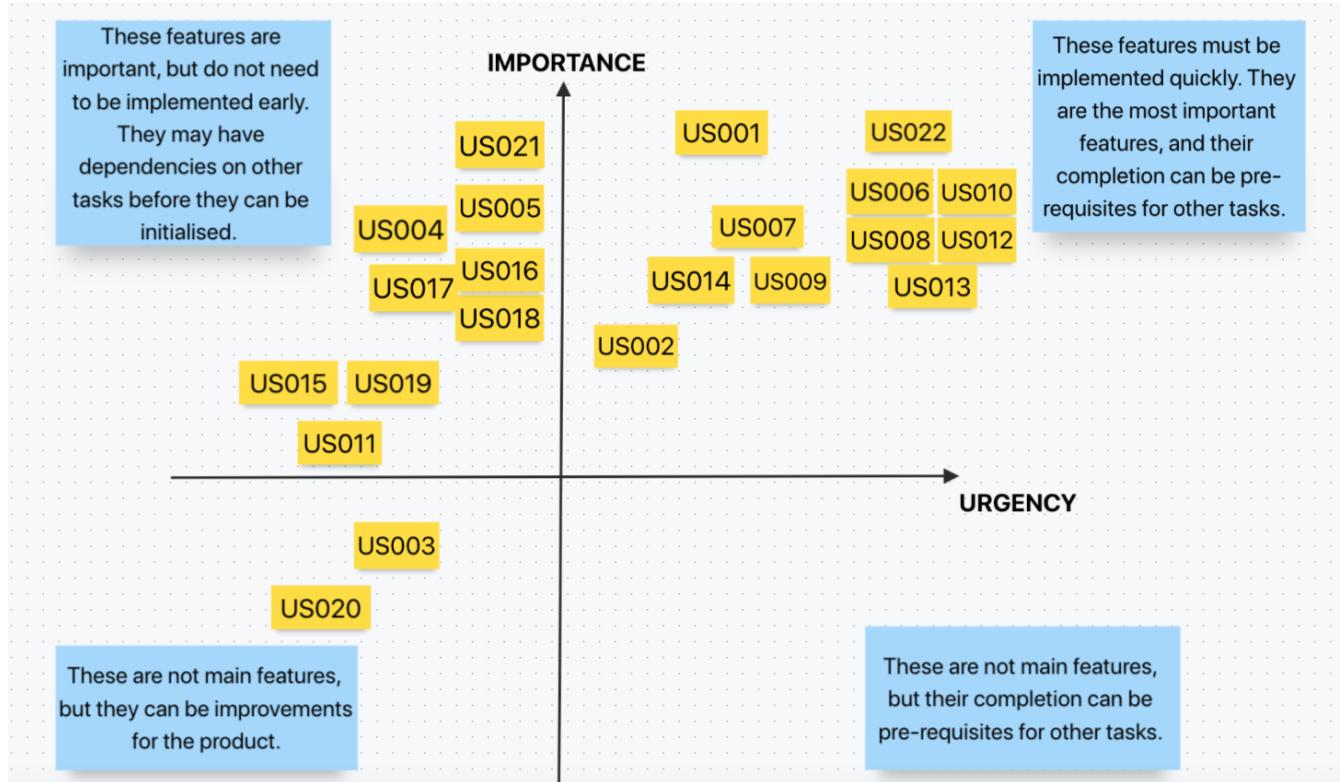


Figure: Initial prioritization according to importance and urgency

MoSCoW Prioritization

The acronym MoSCoW represents four categories of initiatives: must-have, should-have, could-have, and won't-have, or will not have right now.

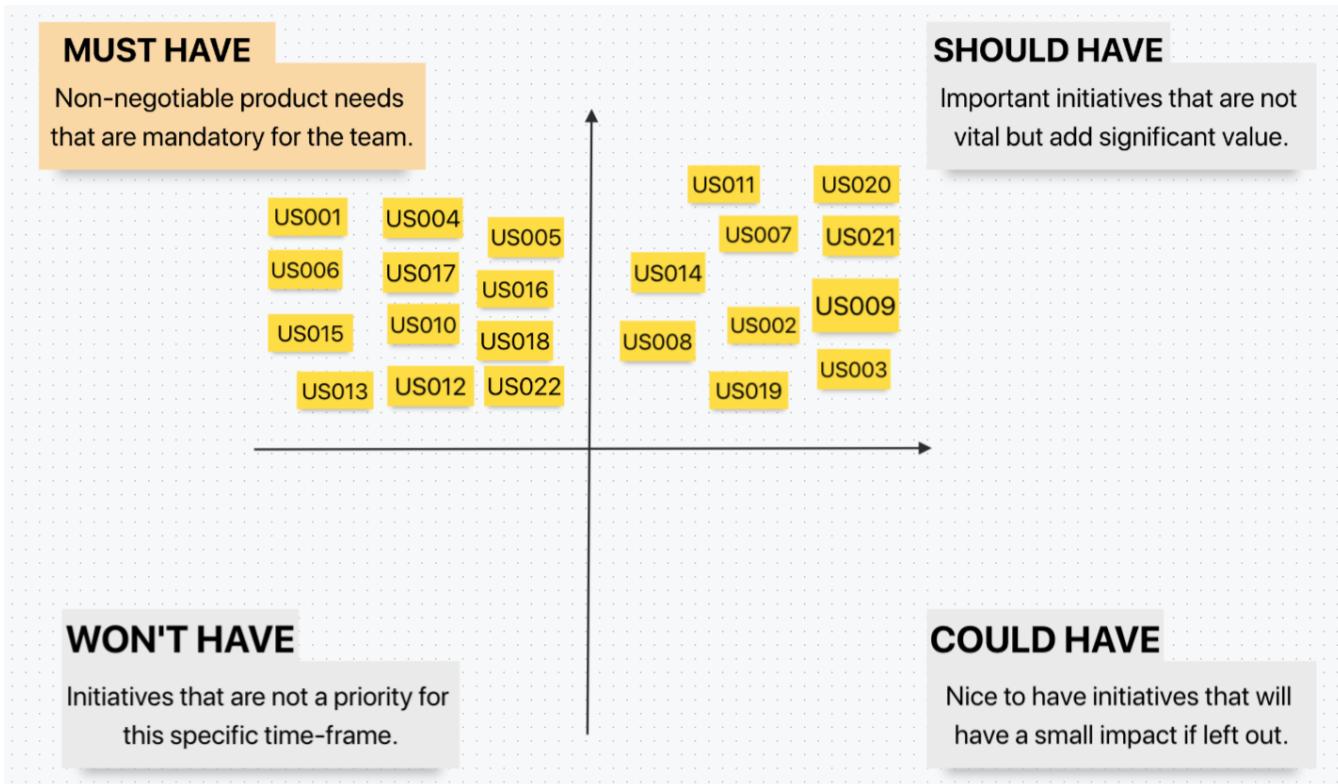


Figure: MoSCoW Prioritization

Jira - Card Structure

- [User Story Card Structure](#)
- [Sub-Task Card Structure](#)

User Story Card Structure

When creating cards for User stories, please fill in the following:

- **Title:** User Story ID and description.
- **Priority:** MoSCoW Priority according to [Product Backlog](#).
- **Deadline:** If not yet decided, keep this section empty.
- **Sprint Number:** Current Sprint number.
- **Story Point:** This User Story's story point according to [Product Backlog](#).
- **Description:** Sub-Tasks that relates to this User Story according to Sprint Backlog. If sub-tasks are not generated yet (i.e. sprint planning has not started), keep this section empty.
- **Assignee:** Assigned by Scrum Master and Dev Lead.
- **Labels:** Select relevant labels for this User Story.
- **Child Issues:** Add any sub-tasks for the current User Story by clicking "Add a child issue" button below the title (please refer to the *Sub-task Card Structure* in this page for more detail).
- **Linked Issues:** Add any dependencies for this User Story with the right relationship (e.g. blocks).

The screenshot displays a User Story card structure divided into two main sections: the top section shows the overall User Story details, and the bottom section shows its sub-tasks.

User Story Details (Top Section):

- Key:** KAN-24 / KAN-15
- Title:** US001: As an app user, I want to have an informative dashboard home page, so that I can choose to see my field's conditions straight away.
- Buttons:** Attach, Add a child issue, Link issue, ...
- Priority:** Must Have
- Deadline:** Sep 21, 2023, 12:00 AM
- Sprint Number:** 2
- Story Points:** 5
- Description:**
 - 1.1 Design the high-fidelity prototype for the dashboard page
 - 1.2 Display relevant data retrieved from databases according to user account
 - 1.3 Finalize front-end development of the dashboard according to prototype

Sub-Tasks (Bottom Section):

- Key:** KAN-24 / KAN-15
- Task 1.3:** Finalize front-end development of the dashboard according to prototype
- Child issues:**
 - KAN-66: 1.1 Design the high-fidelity prototype for the dashboard page (Status: DONE)
 - KAN-67: 1.2 Display relevant data retrieved from databases according to ... (Status: IN PROGRESS)
 - KAN-68: 1.3 Finalize front-end development of the dashboard according to ... (Status: IN PROGRESS)
- Linked issues:**
 - KAN-17: US003: As an app user I want to have important data highlighted (Status: BACKLOG)
- Activity:**
 - Show: All, Comments, History
 - Sort: Newest first
 - Add a comment... (with a placeholder for pressing M to comment)

Figure: Sample User Story Card Structure Separated into Two Sections

Sub-Task Card Structure

When creating cards for Sub-Tasks, please fill in the following:

- **Title:** Task description
- **Description:** Acceptance Criteria related to this task according to Sprint Backlog.
- **Assignee:** Same as parent User Story
- **Labels (Optional):** Select relevant labels for this Task

The screenshot shows a sub-task card for '1.2 Display relevant data retrieved from databases according to user account'. The card is in the 'In Progress' status. It includes sections for 'Description' (with bullet points about displaying specific data and updating in real-time), 'Activity' (with tabs for 'All', 'Comments' - which is selected, and 'History'), and a comment input field. On the right, there's a 'Details' panel showing assignee (Yunqing Yu), labels (None), development (Create branch, Create commit), releases (Add deployment), reporter (Yilin Liu), and creation details (Created 4 days ago, Updated 4 days ago). A 'Configure' button is also present.

Figure: Sample Sub-Task Card Structure

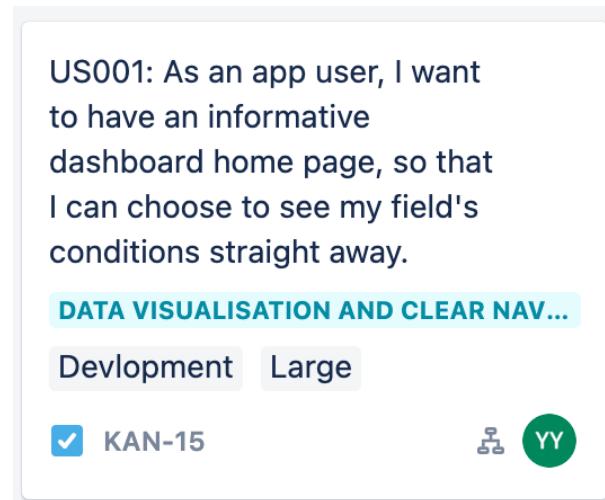


Figure: Sample Card Displayed on Kanban Board after linking Epics

Jira - Workflow

Jira Board Status Description

- **BACKLOG:** The 'BACKLOG' status represents user stories, sub-tasks or other work items that are not yet scheduled for implementation, or items that need further refinement before being moved to the next stage.
- **TO DO:** When an item is in the "TO DO" status, it means that it's ready to be picked up by the Development Team. These work items are being reviewed and refined, so that they can be part of the active development timeline. Development team members should select items from this status to start working on them.
- **IN PROGRESS:** The "IN PROGRESS" status represents work items that are currently being actively worked on by someone from the development team. It's a clear signal that work is in progress, and the item is being implemented or developed.
- **IN REVIEW:** Items may be moved to the "IN REVIEW" status once the development work is completed and review is assigned to another member in the Development Team. This status indicates that the code has been completed, but it's undergoing quality assurance process to ensure it meets the required standards.
 - **For User Story:** Review process includes completing a testing process (please refer to [Quality Assurance Workflow](#) for detail) and client's feedback if needed.
 - **For Sub-Task:** Review Process includes a simplified peer-to-peer code reviewing and manual checking the functionality among the development team, or ask for client's feedback if needed.
- **DONE:** The "DONE" status indicates that the item has been successfully approved and meets all the necessary acceptance criteria. It's ready for release and can be delivered to the end-users. Work items in the "DONE" status must be production-ready. However, the review process may be skipped for some work items under careful evaluation by the development team, and this decision must be mentioned in the relevant document.

Additional Status

Additional statuses in Jira workflow may not be displayed on the main board but are crucial for tracking and managing work effectively. Here's an explanation of these statuses:

1. **Reopened:** This status is used when a task or issue that was in the "IN REVIEW" status is found to have issues during the review process. Instead of moving directly from "In Review" to "DONE," the item will be moved back to "IN PROGRESS" for further adjustments. This allows the Development team to address any issues before marking the item as complete. Every Reopened tasks should be indicated in the task description.
2. **BLOCKED:** When a task is in the "BLOCKED" status, it indicates that there are barriers blocking progress on this task. This status can be indicated by add a flag to a work item. These problems may be dependencies on other tasks, unresolved bugs, or external factors that need to be resolved before work can continue. The "BLOCKED" status helps the team identify and address these issues promptly, which may involve collaboration among team members to remove the blockers and get the task back on track. Once the blocker is removed, the flag can be removed from the task and status will be returned back to "IN PROGRESS"

[Link to Workflow Chart](#)

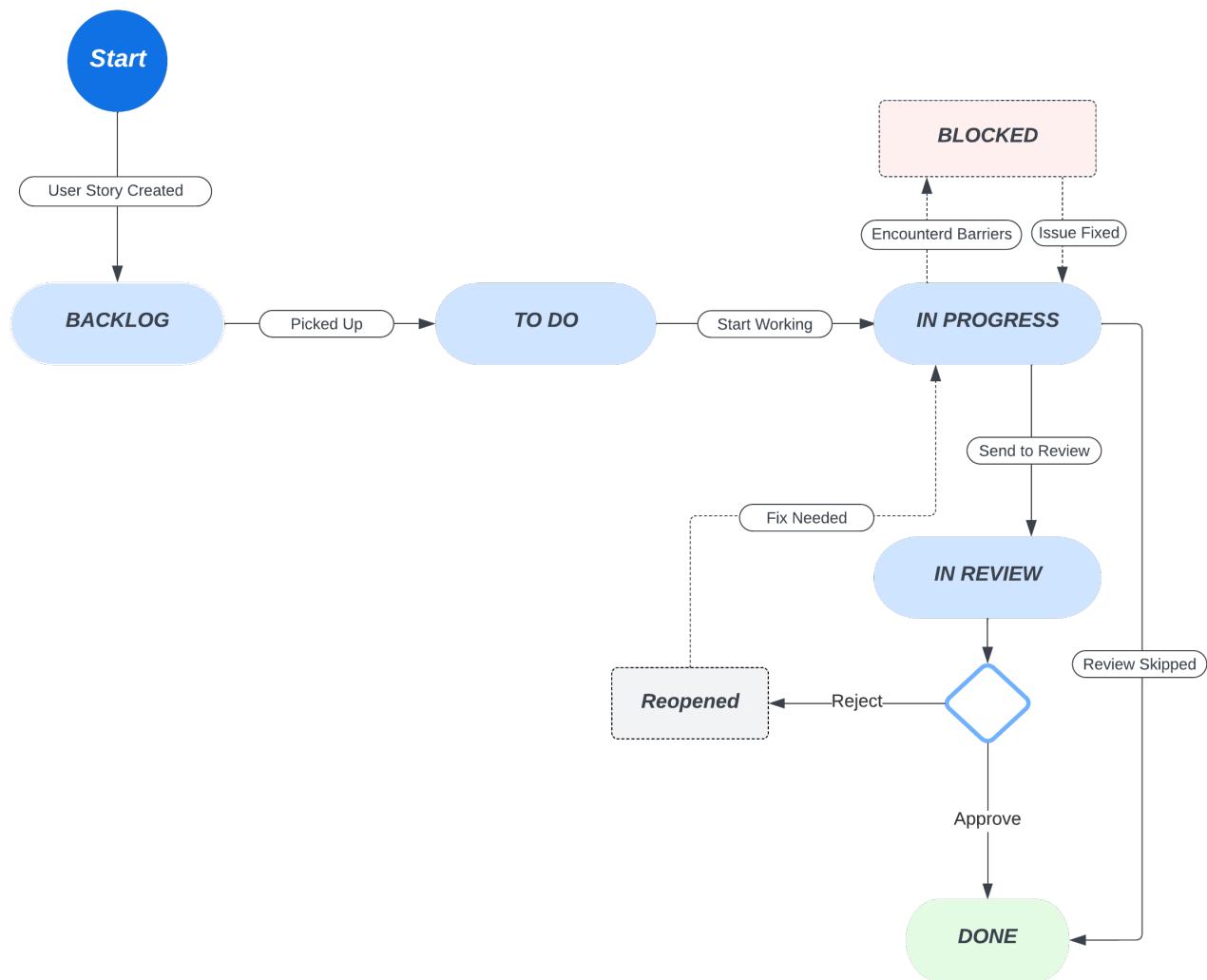


Figure: Jira Workflow