Growers.IO

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Functional Overview

Growers.IO is a cross-platform application to control containers to ensure excellent plant growth, and most importantly keeping containers secure. Includes advanced features that allow the owner to manage their containers, and the farmer to have fine control over environment conditions within the container.

Design Overview

Once you enter the app there will be the sign up/sign in page in which the user can create an account to use with the app. With the registration process, the user may specify whether they are a technician or a fleet owner. Once the user has logged in, they will be navigated to the home page. The entire app has a flyout menu which has a profile page button, and a theme selector.

As a fleet owner, the locations of all the containers will be shown. If you are a farmer, you will see a list of containers. In the container list you can click one of the container displays which will show the user a control panel for the selected container, they may also sort the containers by their individual values. In the page's control panel, the user is able to check and regulate the light, humidity, temperature, fan and water level of the container.

The role of fleet owner and farmer is different, thus the owner will have a notification button on the top right which, once clicked, shows a page containing all the security alerts for the containers. They will also have pop-up notifications on their device. In addition, the fleet owner will have the ability to create containers through the use of a navigation button on the bottom bar. They may also access their list of containers through the bottom bar. By contrast, the farmer will only have the home button.
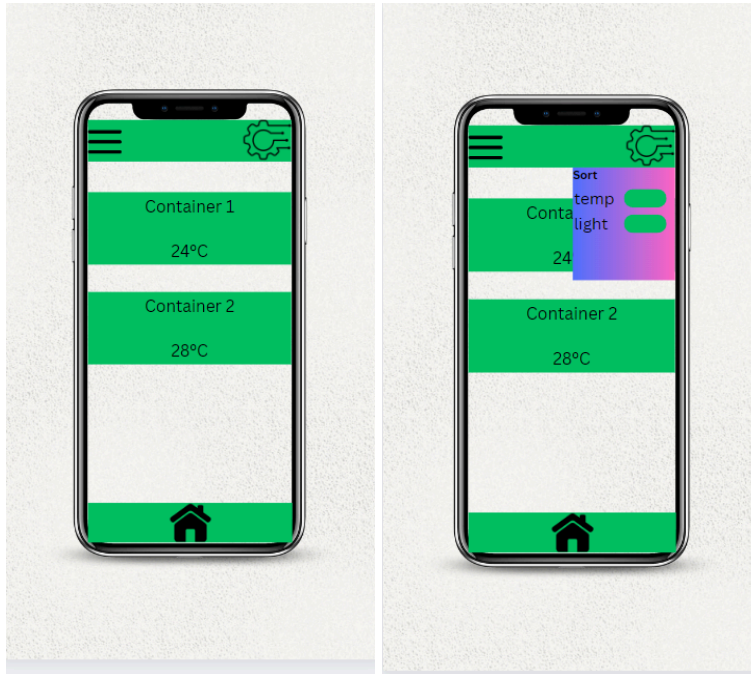
App Prototype

Main page/Log In/Sign Up Page

The user is prompted to enter their email and password to access their account or create a new one. The registration process allows them to select their role.
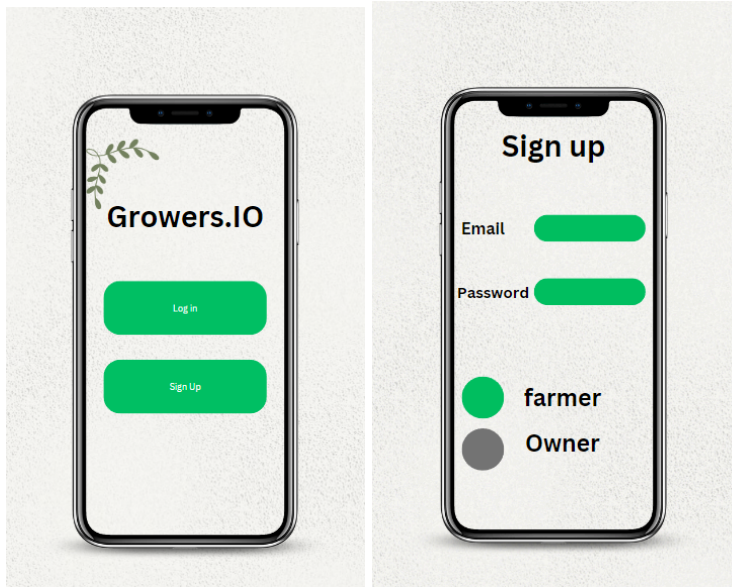
Technician Home Page

It contains the list of containers as well as a sort option for the containers based on temperature and light.


Technician Container Info Page

This page shows all the values captured by the sensors in the container and allows for regulation. We hope that we will be able to include graphs into our app to aid the technician. With the graph, we also would like to add options to change how the graph is displaying the data. This may be the date range, and X/Y scales.
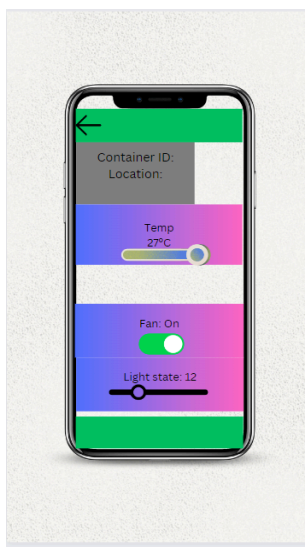
Owner Home Page

It contains the location of all the owner's containers and allows them to select a container by clicking their marker on the map.
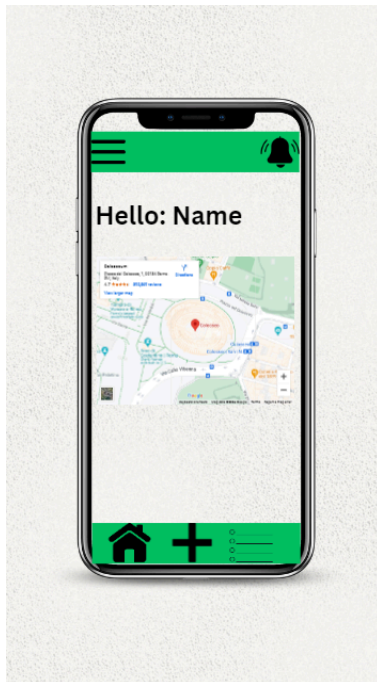

Alert Page

Page that shows the security notifications for all the containers. The user can delete unimportant or already checked notifications by swiping. This page can be accessed through the bell icon in the upper-right corner, if they're a fleet owner.
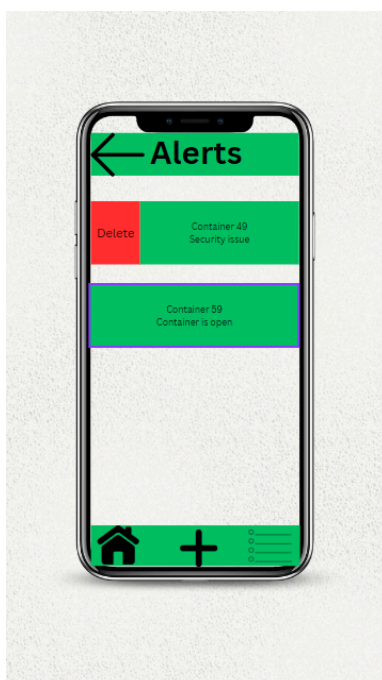
New Container Page

This page allows for the creation of a new container by establishing a connection to the physical container. The user has to enter the name of the container and the name of the technician in charge of the container.
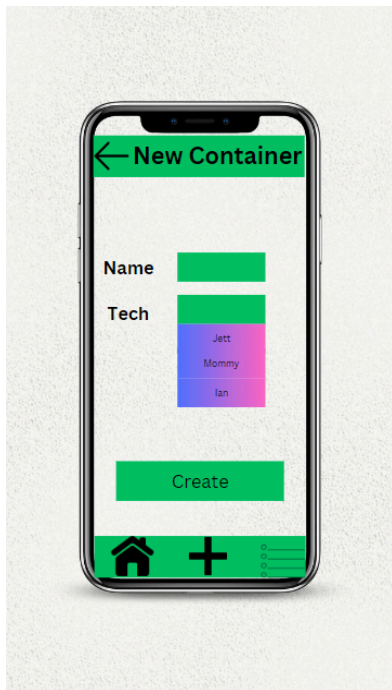
Owner Container List Page

It contains the list of containers as well as a sort option for the containers based on temperature and light.
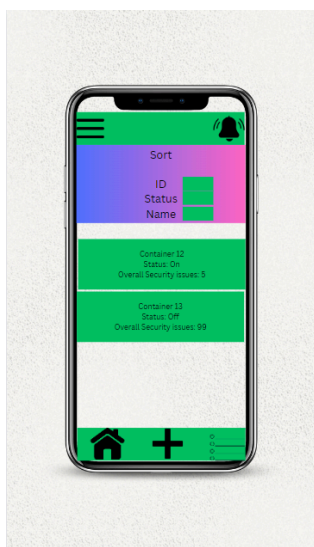
Owner Container Info Page

This page shows all the values captured by the sensors in the container and allows for regulation.
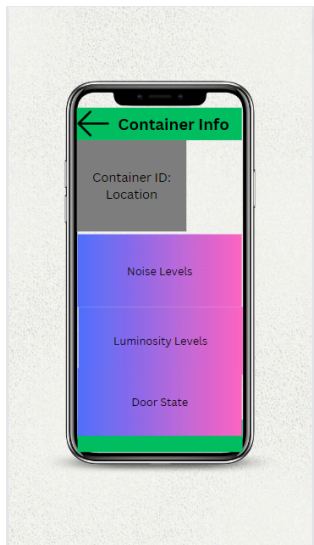
Sidebar/Profile page

The main flyout menu for the app. It contains the profile button and the theme selector (Light/Dark). Profile page added to allow the user to change any personal information they might need to change.

Navigation of the pages

Navigation starts on the main page where it would push a new page to the stack being the sign up page when the sign up button is pressed. There is a back button to return back to the main page. If the login button is pressed, fields for the email will pop up on the page.

Once the user is signed in we will use shell navigation to either home page. From the farmer technicians home page there is a stack navigation push when one item from the list is clicked.

Within the owners home page there is stack navigation with the
- home screen to alert through the top nav bar
- home screen to list through the bottom nav bar
- home screen to container info through pressing a container on the map
- home screen to add container through the bottom nav bar

All screens have the ability to back arrow back.

There is also
- Alert to container info through pressing a notification
- List to container info through pressing a container
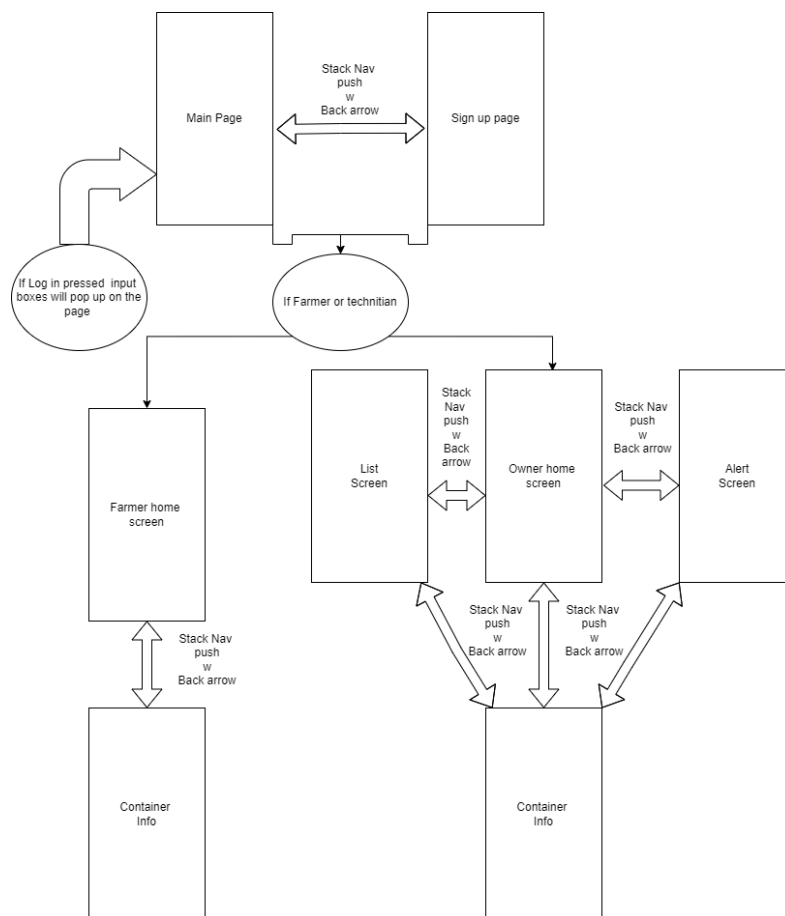
App Features

Must develop:
- View and control environment
- View and control security features
- Control the system depending on role

Would like to develop:
- Have clear and easy access readings of what needs to be seen
- List of all containers with sorting and filtering capabilities for both roles
- Graphs for all measures that should be viewed over time

Could develop if time permits:
- Push notifications when there is a security issue
- Visual indicator to guide the farmer on optimal plant growth
- More information within our profile page about the user such as date joined, amount of containers worked on etc.

Likely would not develop because of lack time or knowledge:
- The live google maps with the coord markers of the containers
- Use a plant API to get best information on the best growing conditions for specific plants

Farming (farmer):
Measure temperature, humidity, relative water levels, soil moisture levels, read fan state, control fan state, read light state, control light state.

Geo-location (fleet owner):
Collect GPS location, read pitch and roll angles, read vibration levels, read buzzer state, control buzzer state.

Security (fleet owner):
Read noise levels, read luminosity levels, read motion sensor state, read door-lock state, control door-lock state, read buzzer state, control buzzer state, read door state.

As a farm technician I want to be able to view and control the light state
- When viewing a farm, I should have a clear view of the current light state.
- When controlling the light state, the view for the current light state should update quickly alongside the controller for a seamless experience.

As a farm technician I want a page to view all environmental reading for a given container
- Easy way to view all live reading for environmental information within the container.
- Readings: temperature, humidity, relative water levels, soil moisture levels
- It would be a nice-to-have to be able to show these measurements over time on a graph.

As a fleet owner I want a one-click button to view all my alerts
- It should be clearly visible there are new notifications
- Button navigates to a page with a list of all alerts, unopened alerts should always be at top of the list
- Clicking on a given alert should navigate to a details page with more information

As a fleet owner I want to add containers and assign a farmer to my fleet of containers
- Container creation page where I can give my container a name, assign farmers, and connect it to the relevant physical container.

As a fleet owner I want a page to view all my containers
- It should be easy to locate the container that I am searching for through the use of filters and sorting.

As a fleet owner I want to have live geo-location data of all of my containers
- Clicking on the container will navigate to its relevant details page
- Page with a map to display the geo-location of my containers. A map would be considered a nice-to-have, otherwise a simple list can be used.

As a farm technician I want an easy to use controller page to set the ideal parameters for growing a given plant.
- Intuitive way to control light and fan states
- Nice-to-have: option to set light & farm to run at certain intervals and/or duration.

As a fleet owner I want page for information for each of my containers
- Collect GPS location, nice-to-have would be to get address information from the latitude and longitude data.
- Read pitch & roll angles, motion sensor data, noise level, luminosity level, door state, and vibration data from containers.
- Nice-to-have: graphs to display certain data that may be useful to viewed over time

As a fleet owner I want a control panel to enable remote security measures
- Controls for door-lock, and buzzer.
- Ability to view the current states of security devices.

As a fleet owner I want to set thresholds for notifications
- Nice-to-have
- Settings page that can be navigated from alerts to setup thresholds for receiving push-notifications

As a fleet owner and farmer I want access to my profile to change any personal information in my account
- Username, name, email

As a user I want to be able to change between light and dark themes for my app
- An option in the flyout menu to change theme
- Preferences should save across app sessions

As a user I want to register/login to an account
- Choose my role as a farmer or fleet owner for registration
- Username, email, password for registration
- Secure authentication for the login process

Potential showstoppers & open-ended questions

- Procrastination leads to things taking longer than they should, potentially causing our workload to build.
- Timing of vacation may require us to work really hard at the end of the semester
- Hardware issues (Connected objects)
- Learning curve with .NET MAUI
  - Since it's fairly new and we are still learning it. We might run into issues that we won't know how to fix.
  - Any issue with emulators