A: Provide a written report (in pdf format), available as a link on your class web page containing at minimum:

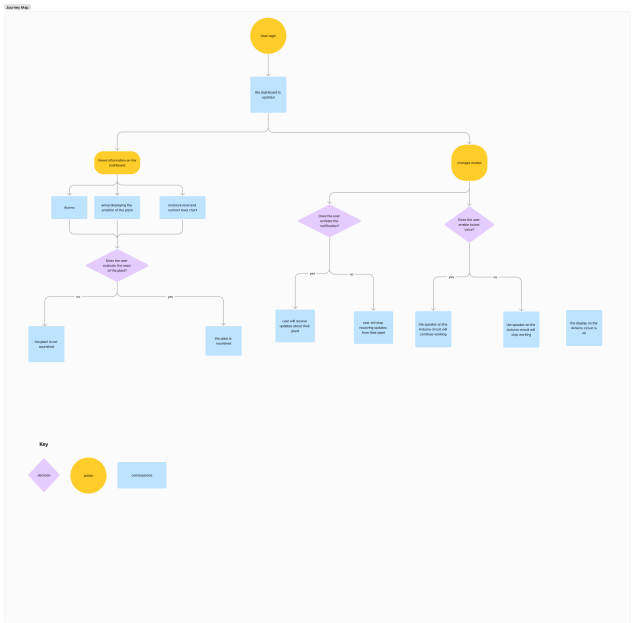
- High level project description: a summary of what was in your project proposal

Botani Buddies is a digital concept designed for people who care about plants. We believe in using digital solutions, like a website, to enhance the experience of plant hobbyists. Through a technical process with sensors and data, a reliable yet unexplored connection could be formed between plants and humans, bridging the gap between them. By providing user-friendly information about the needs of plants through an app, we create a two-way communication where individuals can learn and take appropriate action, and overall be more invested. Our project aims to leverage technology to simplify routine activities, such as plant nourishment.

- Description of which stage you are at in the project: what has been completed and what is still to be completed

During the prototype stage, we successfully implemented the entire front-end of our project. We created a high-fidelity version that included a homepage, dashboard, sign-up page, and login page using HTML, CSS, and JavaScript. However, after discussing with our professor, we realized the need to incorporate user validation through a click, where a notification disappears when the user considers a specific task completed. Additionally, we still need to complete the data transfer from the Arduino to the app. Furthermore, we plan to build a responsive app that is compatible with mobile devices.

- Detailed images/diagrams of the overall system (i.e. how data flows between the various components)



- For each component/feature, provide written descriptions on the usage/purpose and how it integrates into the project.

★ Login Component:

Our application includes a login component for personalized progress analysis. User data is stored in a database accessible upon account verification.

★ Sensory Kit (data collectors):

This comprehensive list of essential sensors and devices that will be placed on the plant—such as Particle, display board, soundboard, UV lamp, speaker; and sound, NPK, moisture, and light sensors—

★ Connection to the Server (data transmitter):

The Particle microcontroller will send gathered data to the client app.

★ Dashboard:

The dashboard serves as the user-friendly interface for transferred data, thoroughly translated into understandable semiotics. It's designed to minimize labor, and uncertainty by presenting data in a playful, digestible, and relatable format. The dashboard displays account information, plant tips, weekly plant monitoring, graphical assessment of the plant's condition, and the moisture and NPK level information which will be interpreted as the emotional state of the plant, by text and emojis.

★ Community tab:

We wanted to cultivate a sense of community among users, providing opportunities for them to interact and collaborate. The community tab will showcase others' progress and achievements, enabled through various avenues such as liking, posting on forums, and commenting.

★ Map Visualization:

Using Leaflet, we wanted to create a customized interactive map that shows the locations of fellow Botani Buddies users.

★ 3D Model:

Using three.js, we wanted to present a 3D model of the plant, highlighting its structure and features.

★ Notification:

Users connected to the server can choose to receive notifications related to their plant, ranging from nutrient and moisture levels to emotional states and general updates: a message about the noisy environment.

★ Botani Voice:

When connected to the server, users have the option to activate Botani's voice, allowing the system to emit sound and speech through the plant's integrated speaker. The sound emission is determined by the moisture level, so that the plant can tell the human if it needs water.

★ Botani Visual:

Attached to the plant is a display that depicts the plants mood. The visual representation will be influenced by the NPK levels, so a set range of different values will be shown as a spectrum of expressions from happy to sad faces on the display.

- Have completed some basic user testing. Please provide the questions that you asked your users as well as the results.

  One team has suggested incorporating a community-based section where users can share updates about the growth or deterioration of their plants. Additionally, one student has suggested considering hierarchy when designing our dashboard. For example, enabling or disabling notifications and emergency mode should be done on a separate pop-up page rather than directly on the dashboard. To perform these actions, the user would need to click on an icon to access the pop-up page.

  Another student provided us with suggestions for the visual and voice components. She made us reflect on how we want to characterize the plant: as to whether to use a human voice and a cartoonish face, or a more noise-like sound and an abstract visualization.

- Detailed explanations for which features/components are working and which need to be modified/adapted/scraped or reworked.

★ Login Component:

The login component is operational; we're in the process of implementing the email feature for password retrieval.

★ Sensory Kit:

Individually, the NPK and moisture sensors are functional—the NPK outputs a visual composition on the display while the moisture sensor triggers sound on the speaker. Our next step is to integrate these sensors together and add the sound and light sensors.

★ Connection to the Server:

Previously relying on Arduino, we've initiated the transition to a Particle microcontroller for data transmission to the client.

★ Dashboard:

The dashboard has all the elements to translate the received data into easy, playful human friendly language. Our current focus is on linking it to the incoming data, using the Particle

★ Community Tab:

As outlined in the proposal, the inclusion of a community tab is not a primary feature of this app. Therefore, we've deferred its development to a later stage, after completing data transfer and transformation.

★ Map Visualization:

We have also deferred the development of a customized interactive map to a later stage, after the app is fully made.

★ 3D Model:

Originally aiming to create a 3D plant using Blender and to present it with three.js, our approach might shift to utilizing an existing model or reconsidering the 3D model concept entirely.

★ Notification Aspect:

plant notifications upon client-server connection is an exciting prospect we are actively developing.

★ Botani Voice:

The speaker and the in-app feature are fully functional; our pending task involves linking the two components with the Particle.

★ Botani Visual:

The display is functional, but it currently shows the NPK levels in raw format. We Have to establish ranges and associate each range with a corresponding emotional state to properly translate these levels into a spectrum of expressions from happy to sad faces.

B: Interactive Prototype:

- A clickable Wireframe Prototype (evaluation of hyperlinking and navigation)

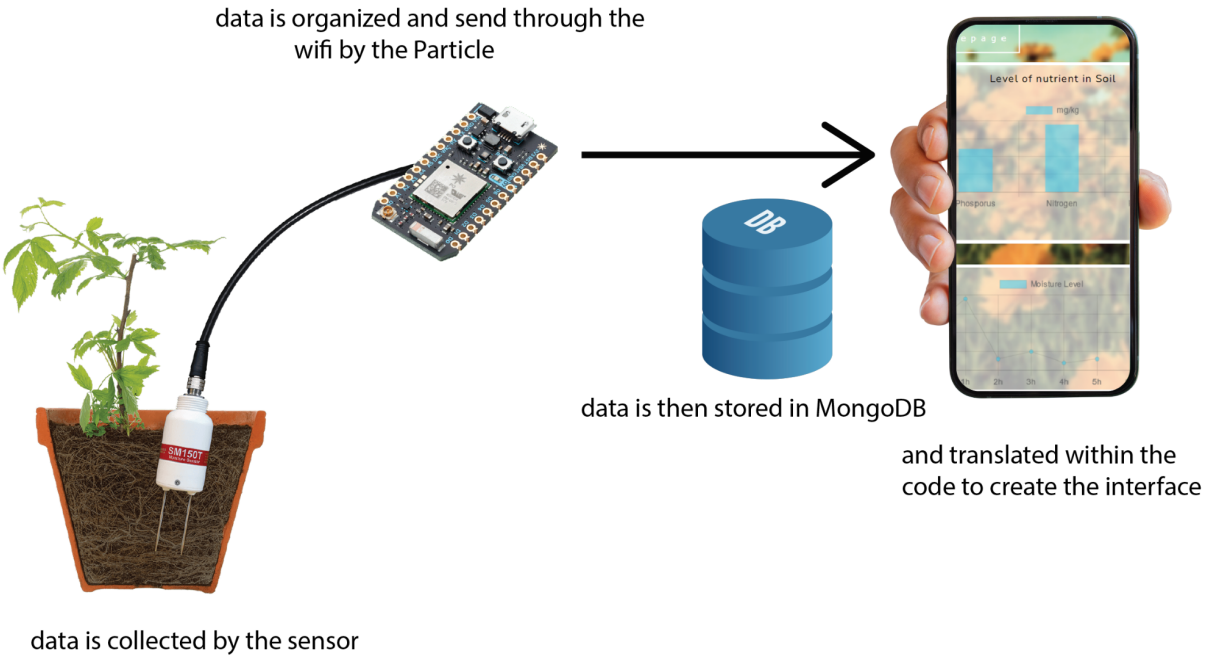
  Link to our website: https://hybrid.concordia.ca/ma_aoune/Botani_Buddies/index.html

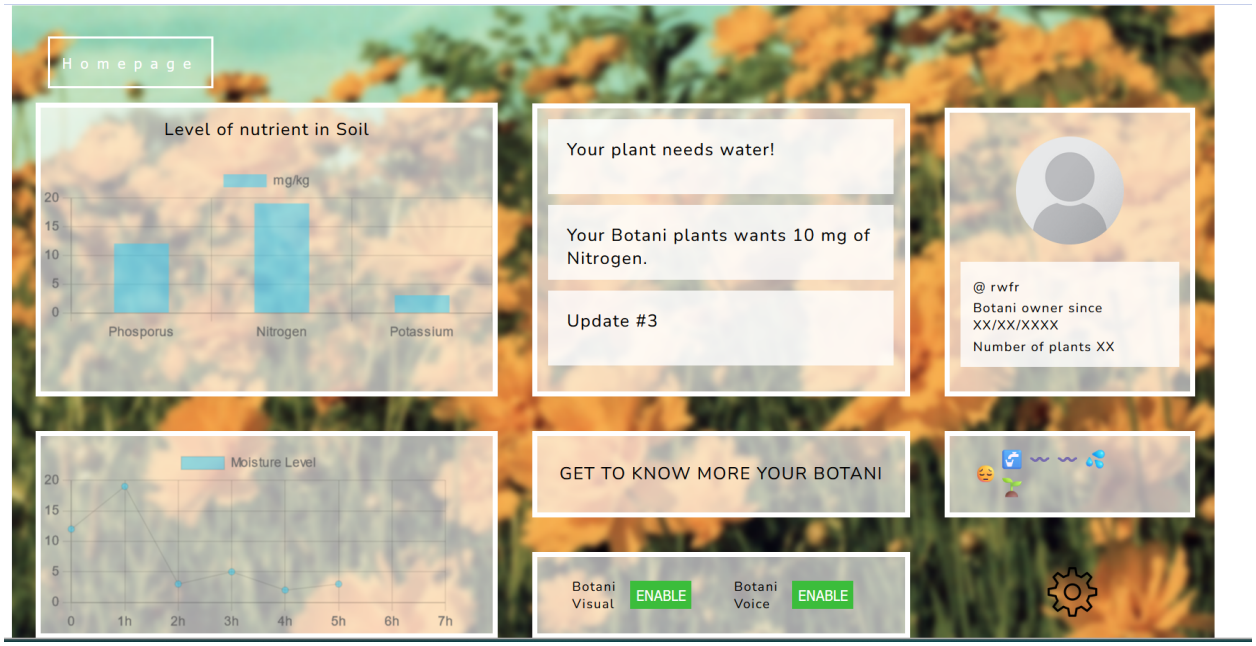
- A Mid Fidelity User Interface (evaluation of User Experience, Layout and Aesthetic Considerations)
- Appropriate selection of API's and 3rd party libraries

  To visually represent the data gathered from the plant, we have made a deliberate decision to utilize the chart.js library. By incorporating this tool, we are able to create visually appealing and informative charts that effectively showcase the moisture level and nutrient levels of the plant. With the aid of these charts, users can easily interpret and understand the specific needs of the plant, allowing for timely and appropriate action to be taken. This simplification of data reading eliminates any potential confusion or ambiguity, ensuring that the plant receives the care and attention it requires. By presenting the moisture level and nutrient levels in a graphical format, the plant is able to "speak" to the user in a language that is easily understood. This visual representation enables a seamless transfer of information, bridging the gap between the plant's needs and the user's understanding.

- Data map illustrating the data storage and data sharing requirements (i.e. What will you be storing/retrieving from the database and how?)

Data collector: sensors
Data transmitter: Particle
Data storage: MongoDB
Data translator: code




Homepage
Level of nutrient in Soil
mg/kg
20
15
10
5
0
Phosporus
Nitrogen
Potassium
Your plant needs water!
Your Botani plants wants 10 mg of Nitrogen.
Update #3
@ rwfr
Botani owner since XX/XX/XXXX
Number of plants XX
Moisture Level
20
15
10
5
0
0
1h
2h
3h
4h
5h
6h
7h
GET TO KNOW MORE YOUR BOTANI
Botani Visual
ENABLE
Botani Voice
ENABLE