# Smart Agriculture Monitoring with IoT

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## Background

### Problem

Millions of individuals are unable to care for their plants as weather fluctuations, varying care needs, and the lack of established plant health data make it difficult to keep plants alive.

### Objective

Develop an IoT sensor for plants that keeps track of the critical details that factor into plant growth and health. Transmit the collected information alongside recommendations to enable plant owners to better manage the resources they use and help decrease water and energy use.

## Market Potential

### Outreach

Research has show that there are over 50 million potential customers in the United States who identify as “Plant Parents.” These are individuals who care for multiple plants and also often encounter struggles with that care.

### Early Adopters

The initial focus for the Plantfi technology is a subset of the larger group—specifically, the customers who live in an urban environment, are technologically savvy, and have a busy schedule that prevents them from being attentive to their plants. This is approximately 1.5 million individuals and they represent the early adopters.

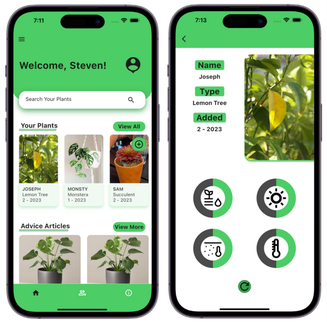
## Our Solution

### Hardware

A custom Printed Circuit Board (PCB) was designed and developed to integrate all sensors required to track plant health. The board has an integrated WiFi and Bluetooth chip to enable communicate to a mobile application and cloud services. An enclosure was also constructed to prevent environmental damage to the hardware as it is used by customers.


### Software

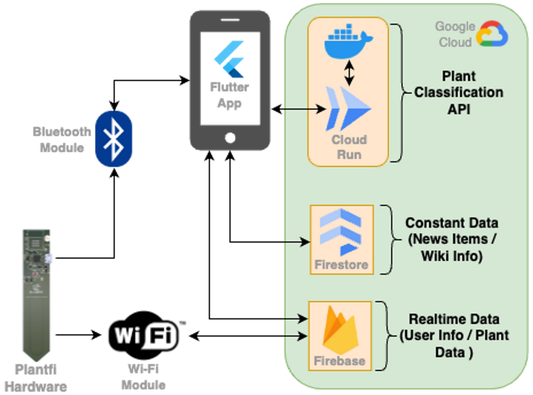
The software implementation for the project uses Flutter for the mobile application and custom designed firmware for the hardware sensor. Both are integrated using BLE / WiFi. The objective of this software is to collect readings and then showcase those readings to the consumer, so they understand their plant’s health.




### Impact

As a product, the Plantfi sensor and application makes life easier for plant owners. It enables them to understand their plant’s health and take better care of it. This results in more optimized resource allocation—namely water—and helps keep dead plants out of landfills.

## Infrastructure




The software architecture incorporates on-device and cloud-based solutions to enable our objectives.

## Next Steps

**Beta Testing**
Run a small-scale beta release of 100 units of the product to test capabilities and potential changes.

**Marketing**
Develop packaging, advertising plan, and more case designs to appeal to a larger customer base.

**Release**
Adjust based on feedback and release product to a larger customer base with 1000 units. Move towards a retail presence.

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**Sponsor/Client: Plantfi**

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