

Smart Greenhouse Laboratory Prototype

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Team 5



DESIGN IDEA

The Smart Greenhouse is a complete product that consists of the structure, the automation system, and the Graphical User Interface (GUI)

- Structure: Wooden frames, isolation tarp, plant pots, water tank, electrical box
- Hardware: Raspberry Pi, sensors, relays, automation components
- Software: Python (automation program), Blynk (GUI)

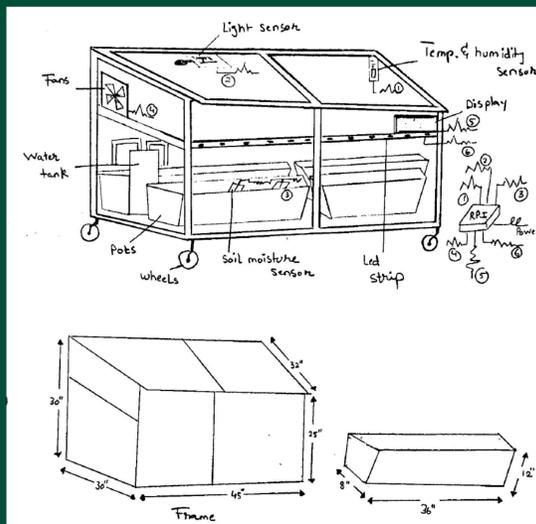


Figure 1: Smart Greenhouse design-1

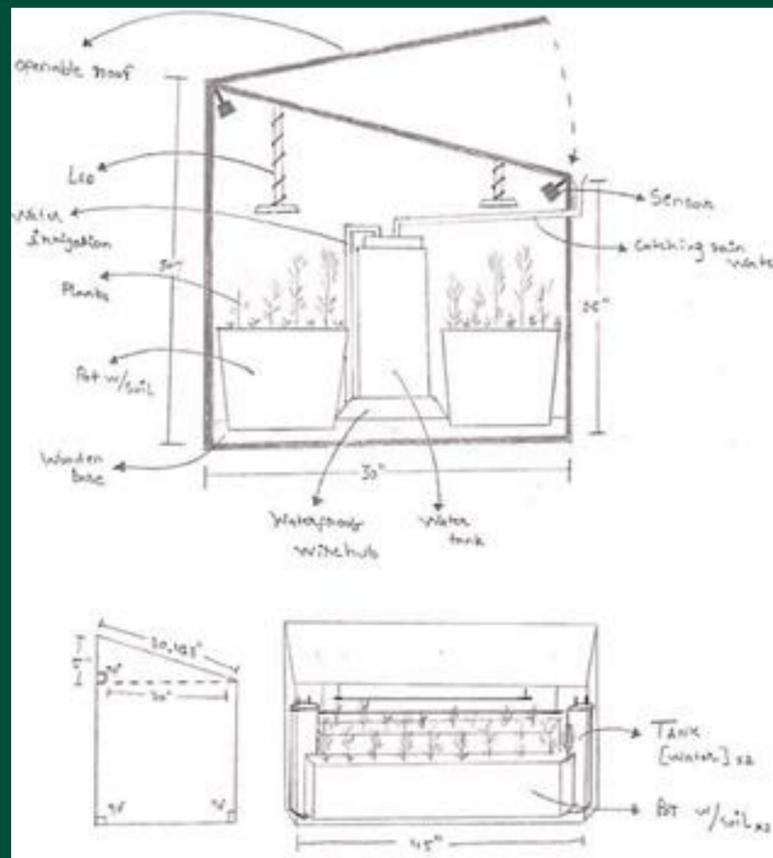


Figure 2: Smart Greenhouse Design-2

BACKGROUND

The agriculture industry severely suffers from the effects of climate change. The loss in agriculture related to short water supply, loss of land and lower crops stability ultimately reduces the food supply while the population of the world is increasing. It is less accessible for some people to have enough nutritional food, and food security has become a significant problem.

IMPACT ON COMMUNITY

- Provides individuals with organic and healthy food with minimal effort and agriculture knowledge.
- Helps save the limited source of water compared to the traditional farming method.

SUMMARY OF WORK

The automation system consists of auto growing LEDs, heater, ventilation, humidifier, and water system. Through the GUI, users can view the environment status such as light intensity, humidity, temperature, and soil moisture level. The users are also provided with the ability to control the hardware manually as easy as pressing a button.

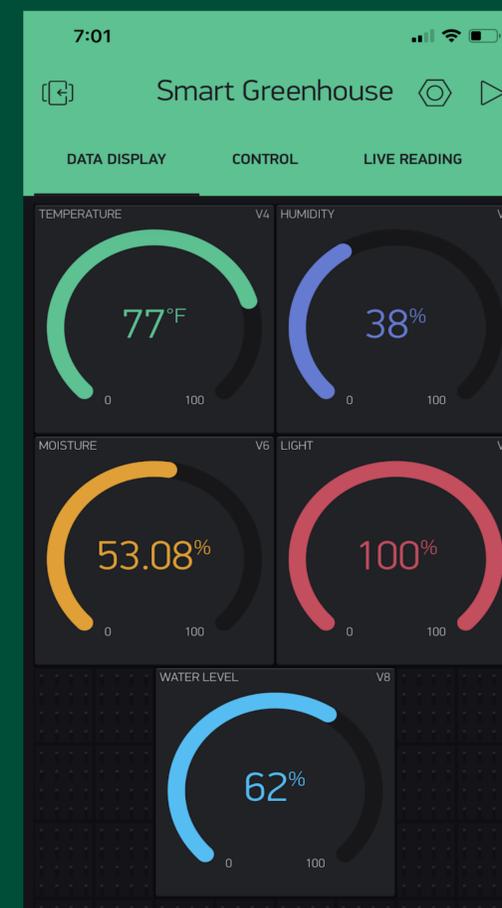


Figure 3: Smartphone App



Figure 4: Greenhouse image-1



Figure 5: Greenhouse image-2