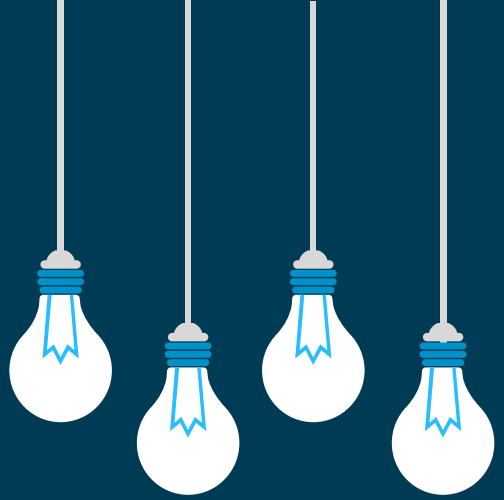


PROBLEM

SOLUTION

WCE HACKATHON 2020

IDEA SUBMISSION ABSTRACT

Team Information :

1. Team Name : **Fsociety**
2. Team Leader : **Vinod Kamat**
3. College Name : **Pune Vidyarthi Griha's College of Engineering and Technology , Pune**
4. Theme : **Agrotech**
5. Subtheme : **Automated irrigation management system**

Team Members' Roles and Responsibilities :

- **Yatish Kelkar**
  UI Design (Front-end)

- **Sushant Vernekar**
  App Development (App's logic)

- **Gaurav Khairnar**
  Arduino Programming using C,C++ (communicating with sensors and sending their data)

- **Vinod Kamat**
  Server Programming and Database Management (Back-end)

Project Abstract :

- In a country like India, where over **85%** of available water resources are diverted to **irrigation,** reports estimate that more than **60% of that is wasted** due to improper irrigation practices. Coupled with the huge scarcity of available farm labor, Indian farmers are at more losses than ever. Aiming to provide an effective, low cost and efficient solution, we propose the idea of building an **Automated Smart Irrigation System** which will reduce the financial and physical hardships faced by farmers.

- **Objectives** - 1) Optimize water consumption. 2) Save energy. 3) Complete automation. 4) Decrease the cost of operation. 5) Easy to use system for farmers. 6) Adding an analysis perspective to farming.

- The Arduino system along with moisture sensors and the solar panel will be situated at various locations on the field. This will transmit the moisture readings to a main Arduino via.**wireless communication** which will be regulating the water flow. Temperature and rain sensor will be placed on the area to check rain and temperature.

- If moisture is dry and it's not raining and also if the temperature is not high (high temperature will result in more evaporation) then the water will be released into the required field. When the moisture level will reach the desired value, the system will **automatically stop the flow.** These readings along with the water level are sent to the server for analysis.

- If the water level in the tank is low then an **alert will be sent** to users mobile. The user will be able to monitor moisture level, water level through his mobile application.

Market Research :

•**54%** of India faces extremely **high water stress**, and farmers are increasingly indebted due to the volatility of crop yields and prices.

•Indian agricultural sector accounts for **15%** of the **total diesel use** and **18%** of the **total electricity use**.

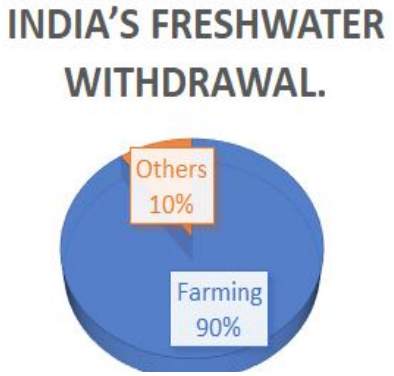
•Our product can be used to attain improved **operational efficiency**, **maximized yield,** and **minimize water wastage** by using **real-time field data collection and data analysis**

•Our irrigation system **reduces water and energy use by up to 80%**.

•**Target Audience**: •Small-Medium scale farming.
•Greenhouses cultivation.

•The global smart irrigation market is expected to reach approximately **USD 1.87 Billion by 2024.**

•**Current Products available in the market**:
- •Avanijal Agri Automation
- •Netafim India.

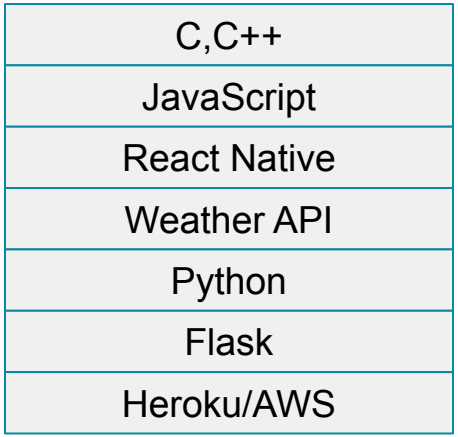


WCE ACM STUDENT CHAPTER

Technology Stack :

- **Hardware Requirements -**
  Arduinos , NRF/HC12 (for wireless communication) , Sensors (temperature, water level sensor, moisture, rain) , Water Pump , Solenoid Valve , Solar Panel .

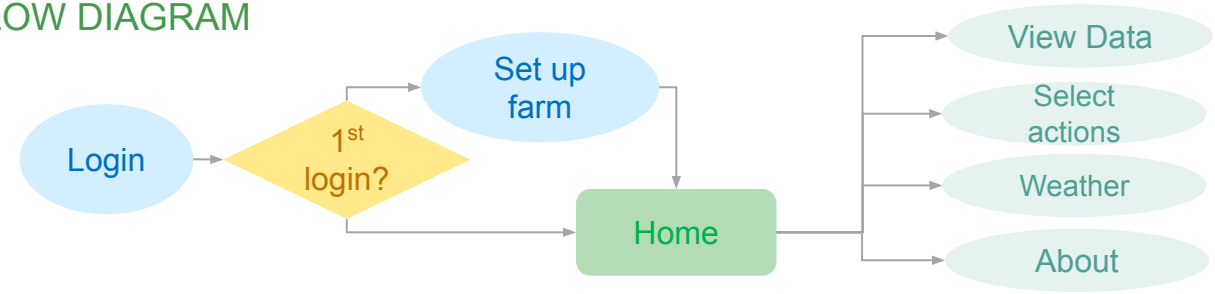
- **Software Requirements -**
  1. Heroku / AWS (for hosting Server and Database)
  2. Flask (framework for Server)
  3. Python (language for Server)
  4. C,C++ (for Arduino Programming)
  5. React Native (framework for App Development)
  6. JavaScript (language for App Development)
  7. Weather API (for displaying weather)

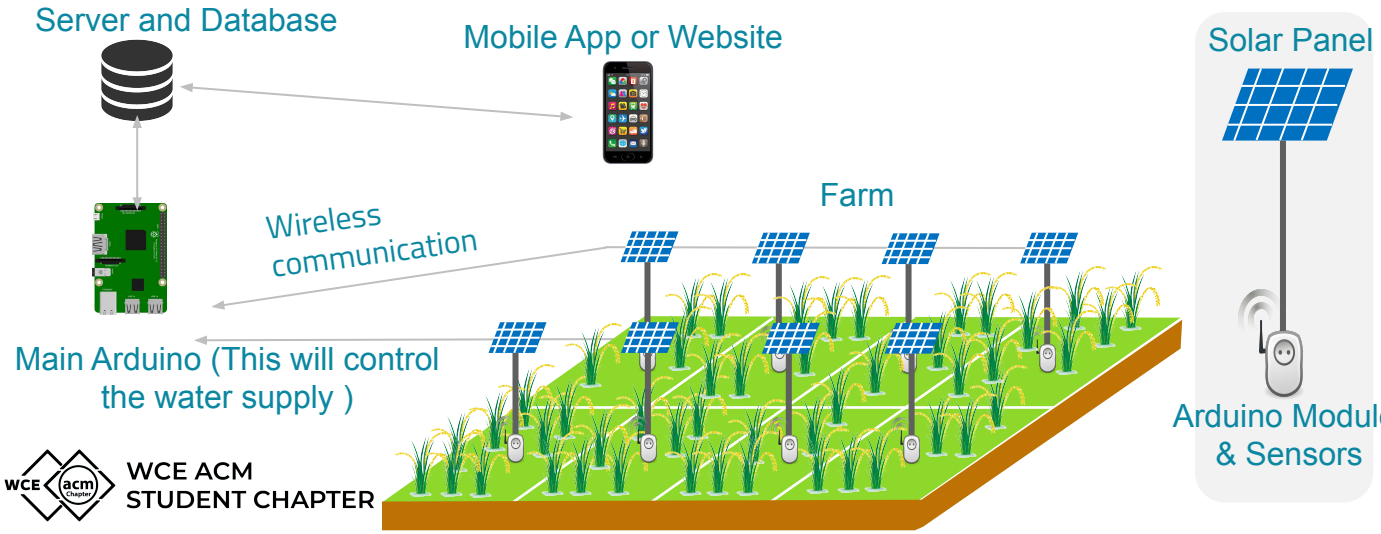


Technology Stack

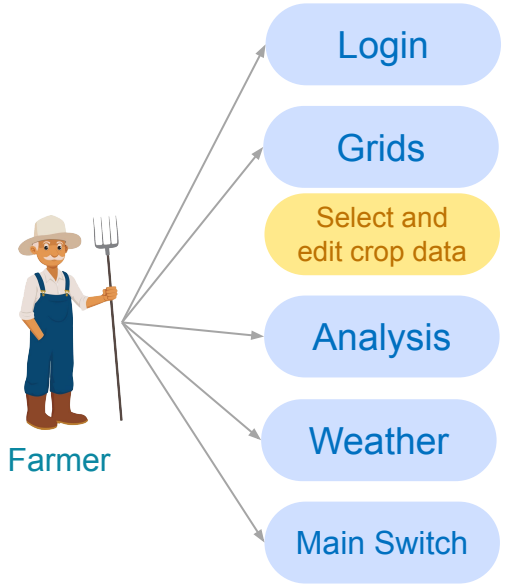
Use Case Diagram, Flow Diagram :

FLOW DIAGRAM





USE CASE DIAGRAM



WCE ACM STUDENT CHAPTER

Innovativeness & Show Stopper :

- **Innovativeness -**
  1) The system works **offline** as well, as the decisions are taken by the Arduino module which receives data through the NRF/HC12 module.

  2) **Solar energy** is being used which will result in less usage of non-renewable resources.

  3) The decisions are taken based on **real-time data** and this is beneficial to farmers

  4) The cost is **inexpensive** and it also saves additional manpower, **conserves water** and **energy**.

  5) The data gained from the sensor can be used for **evaluation**.

  6) **Predetermined Crop models** will be provided for farmers to help farmers select the best possible settings to increase productivity.
- **Show Stopper -**
  1) Hardware Failure.
  2) Power Failures.
  3) Poor Internet Connectivity .
  4) Changes in Weather API policy.