A PROJECT SYNOPSIS
ON
"SMART AGRICULTURE USING IoT"

1.0 INTRODUCTION

Smart agriculture, also known as precision agriculture, is a modern farming concept that utilizes Internet of Things (IoT) technology to optimize agricultural practices. By integrating sensors, devices, and data analytics, farmers can monitor and manage their crops, livestock, and resources more efficiently. IoT devices can collect real-time data on soil moisture levels, temperature, humidity, and crop health, allowing farmers to make informed decisions and take timely actions to improve productivity and sustainability. This technology allows for real-time monitoring of environmental conditions, automated irrigation systems, precision farming techniques, and predictive analytics to optimize crop yields and reduce resource wastage. Overall, smart agriculture using IoT is transforming the way we farm, making it more sustainable, productive, and environmentally friendly.

The several factors which affect the amount of water required by crops in various climatic conditions are:
1) Temperature.
2) Humidity.
3) Sunshine.
4) Wind speed.
The data obtained from these sensors can be used for data analysis and decision making. If sensors are attached with Bots, the data extracted can be used for taking appropriate actions like SCOE's Computer Engineering 2023-24
watering the crops/plants with specific amount of water on proper time, spraying fertilizers in proper amount, taking pictures of the plant for monitoring and disease detection, etc. Furthermore, this smart Bots can be connected with smartphones, which will help in accessing the data from anywhere in the world.
The smartphones can be used as dashboards giving all the brief information of a particular land. This combination of devices will prove to be beneficial in smart farming. IoT proves to be beneficial to agricultural supply chain and provide a critical technology for establishing a smooth flow of agricultural logistics. The key advantages of smart farming are:
1) Proper water management preventing the wastage of water.
2) Soil management for checking pH level and moisture in the soil.
3) Crop monitoring using cameras to detect infections and diseases in crop.
4) Weather monitoring for live monitoring and crop sowing time.

2.0 DESIGN DETAIL: -

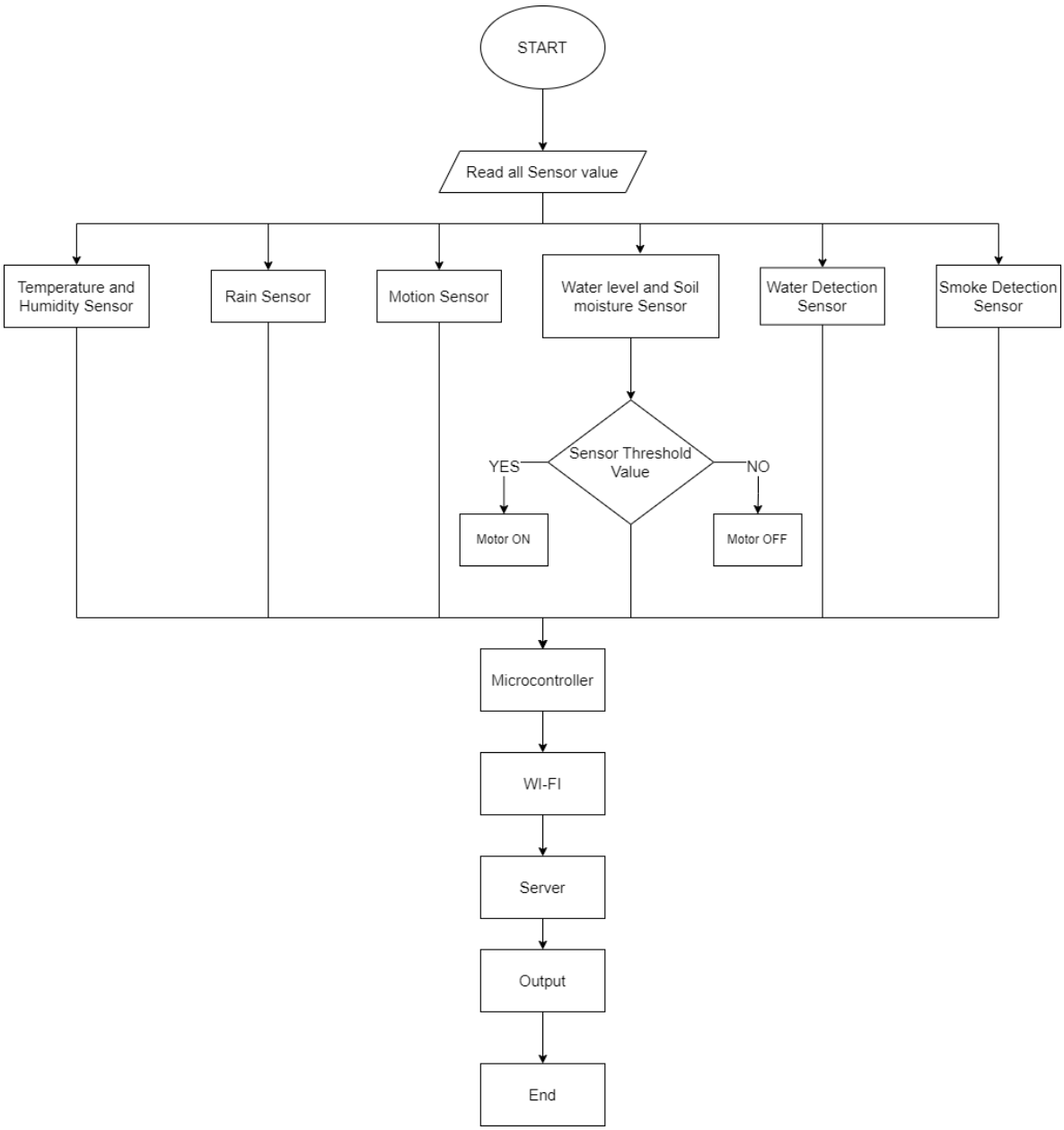

Fig 1: - Flowchart

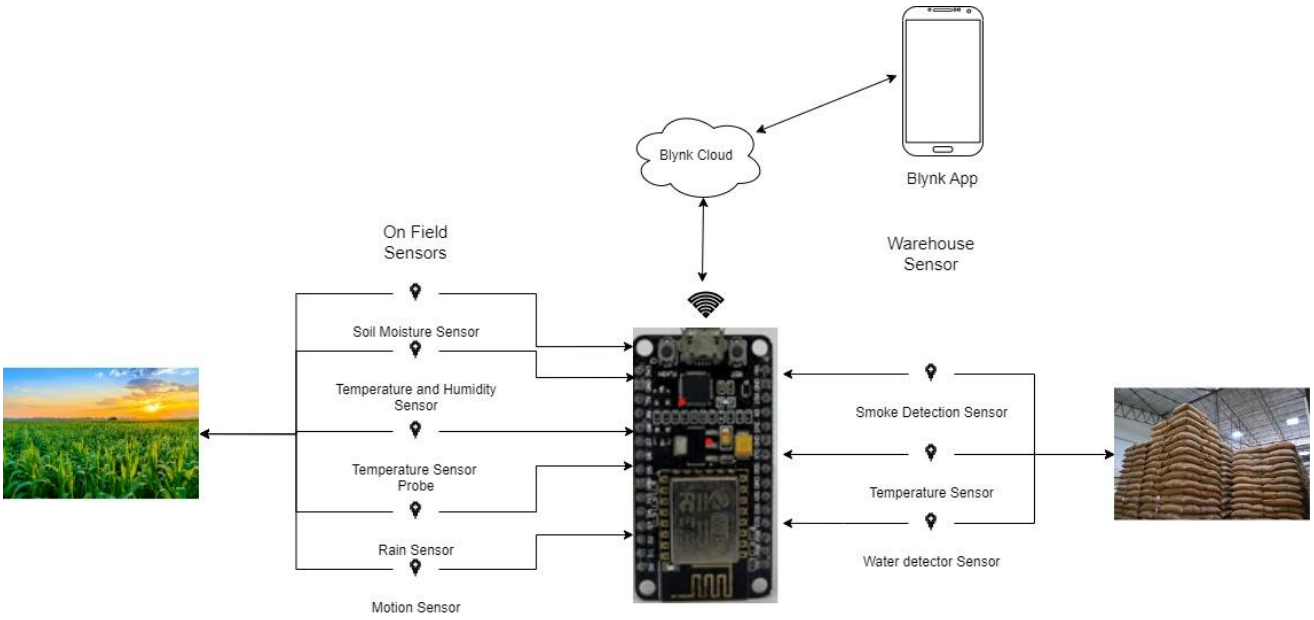

Fig 2: - System Design

3.0 ARCHITECTURE:-

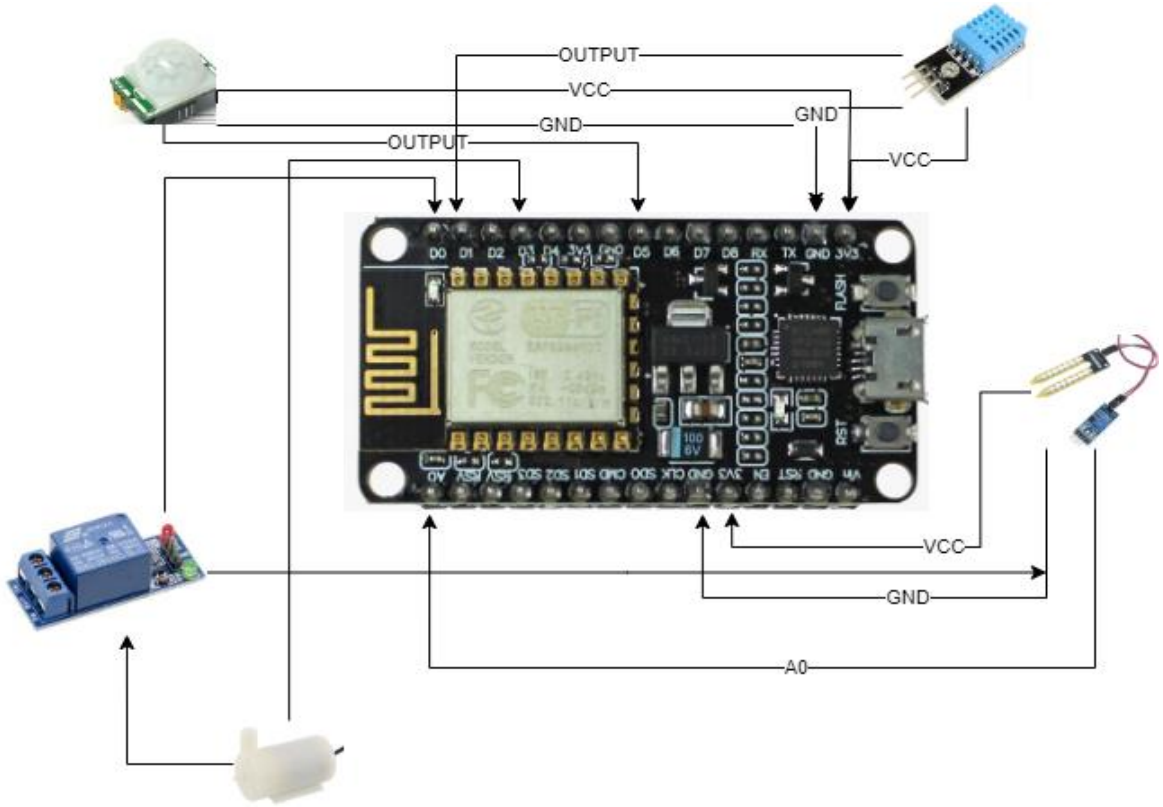

Fig 3:- System Architecture

4.0 IMPLEMENTATION AND RESULTS: -

1) To implement smart agriculture using IoT, farmers can start by setting up a network of sensors and devices across their fields to collect data on various parameters such as soil moisture levels, temperature, humidity, and crop health.
2) These sensors can be connected to a central hub or cloud platform for data processing and analysis.
3) These sensors will work by collecting data from the physical environment by measuring specific parameters, such as temperature, pressure, or motion. Each sensor is designed to capture data related to a particular aspect of the environment.
4) Once the sensor detects a change, it converts the analog data into digital signals that can be processed by a microcontroller or processor. This digital data is then ready for transmission.
5) If the collected data surpasses the threshold value, then action will be taken automatically.
6) These sensors use wireless communication protocols such as WI-FI to transmit the collected data to a central hub or cloud-based platform.
7) Finally, the farmer can see the transmitted data on the web application and can derive valuable insights.

Fig 4:- Sensor in dry soil

As we have placed the soil moisture sensor in the dry soil, so water pump will start automatically.

Fig 5:- Sensor in wet soil

Now in the above image as the sensor is in wet soil and hence the water pump will not start automatically.

Fig 6:- Motion Sense

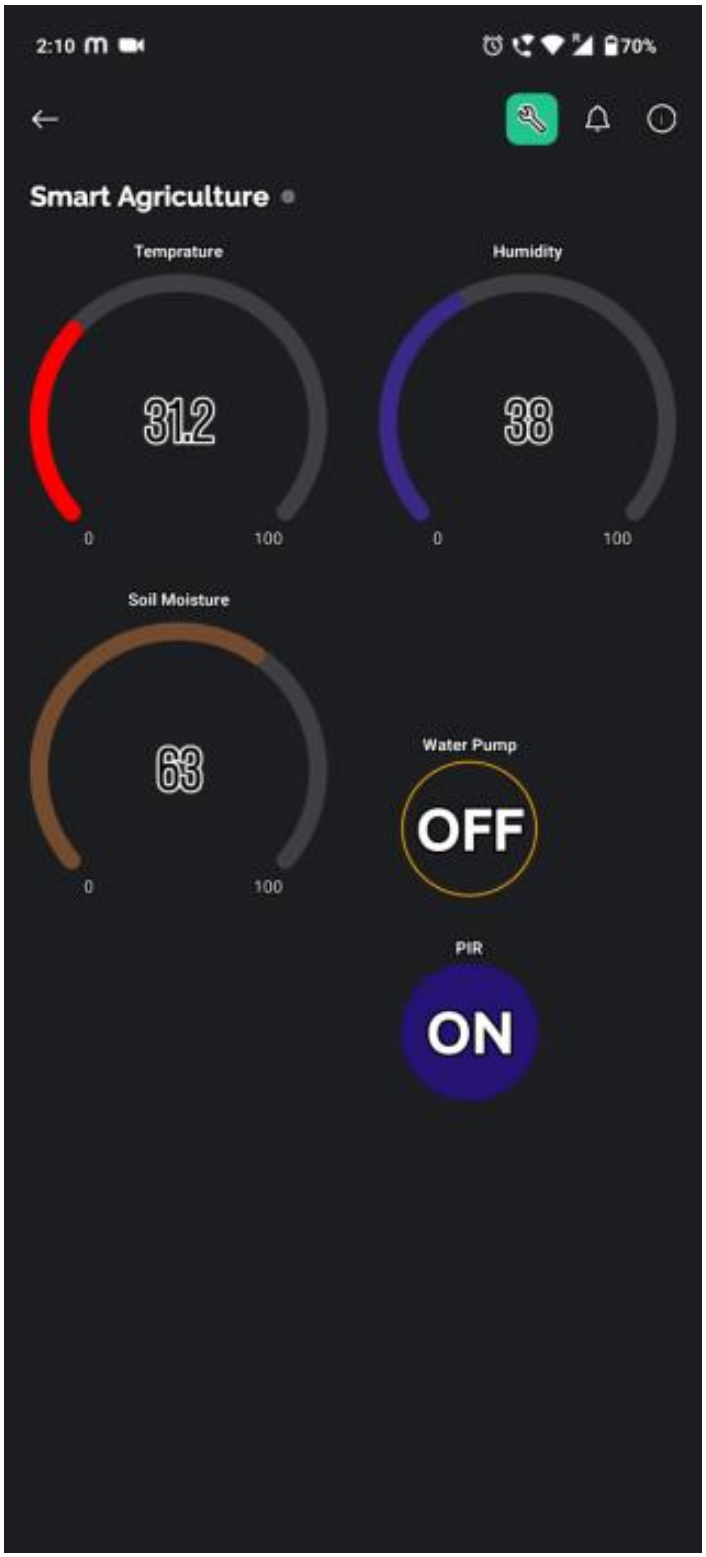

Fig 7:- Sensor Measurements