Ideation Phase
Literature Survey
Smart Farmer-IoT Enabled Smart Farming Application

Date	19 September 2022
Team ID	PNT2022TMID43384
Project Name	Smart Farmer - IoT Enabled Smart Farming Application

1. **Smart Farming – IoT in Agriculture**

   R. Dagar, S. Som and S. K. Khatri, "Smart Farming – IoT in Agriculture," 2018 International Conference on Inventive Research in Computing Applications (ICIRCA), 2018, pp. 1052-1056, doi: 10.1109/ICIRCA.2018.8597264.

Smart farming is the implementation of various technologies and devices like internet, cloud etc for farming applications. In order to feed these billions, we need to increase our production, which can be accomplished by implementing IoT in farming. The population is growing while, on the other hand, the agricultural land is decreasing due to various factors like industrialization, commercial markets, and residential buildings are being made on those agricultural lands. Better crop management, better resource management, cost-effective agriculture, enhanced quality and quantity, crop monitoring and field monitoring, etc. may all be accomplished with the aid of the internet of things (IoT). The suggested model in the research paper uses a variety of IoT sensors, including air temperature, soil pH, soil moisture, humidity, and water volume sensors. Smart farming reduces labor costs, makes farming simple and affordable, increases crop yields, and boosts output.

2. **Internet of Things (IoT) Application Model for Smart Farming**

   J. Sahoo and K. Barrett, "Internet of Things (IoT) Application Model for Smart Farming," SoutheastCon 2021, 2021, pp. 1-2, doi: 10.1109/SoutheastCon45413.2021.9401845.

Utilizing Internet of Things (IoT) devices and cutting-edge technology like cloud computing, smart farming has significantly changed the way that agricultural is done. It permits farmers to be informed about the farm in real time and assist them in making shrewd and well-informed choices. This paper suggested a Model based on distributed data

flow (DDF) for smart farming an application made up of interconnected modules. They have evaluated the proposed application model using two deployment strategies: cloud-based, and fog-based where the application modules are deployed on the fog and the cloud data center respectively. A contrast of the fog- and cloud-based approach for network use and end-to-end latency is also discussed. The DDF technique is used to create an IoT application that offers soil management features. A directed acyclic graph is used to represent the DDF model of the application. Using the iFogSim tool, the suggested IoT application model is assessed. They have put forth a model for an Internet of Things-based soil management application, and use cloud-based and fog-based deployments to test the concept. The test findings demonstrate that, in terms of latency and network use, the fog-based strategy performs better than the cloud-based strategy.

3. IOT Based Smart Agriculture System

G. Sushanth and S. Sujatha, "IOT Based Smart Agriculture System," 2018 International Conference on Wireless Communications, Signal Processing and Networking (WiSPNET), 2018, pp. 1-4, doi: 10.1109/WiSPNET.2018.8538702.

The paper proposes smart farming using IOT, WSN and cloud computing to help farmers plan irrigation schedules according to their needs. Based on information collected from sensors and sent to web applications. Automatic mode and manual mode are the two operating modes of the system. The system makes its own decisions and controls installed devices and Users can control the operation of the system using Android apps are automatic and manual mode commands respectively.

The implementation is a solar-powered automated irrigation system consisting of a distributed wireless network of soil moisture and temperature sensors placed in the root zone of plants. These sensors continuously monitor parameters and send them to an Arduino board acting as an IOT gateway for further processing. This gateway is made wireless by installing a WIFI module that updates data in the cloud. The IOT gateway also has GSM functionality via a connected module. This receiver unit also has a duplex communication link based on the cellular internet interface and uses the GPRS (General Packet Radio Service) protocol. Data uploaded to the cloud allows users to continuously view parameters from the comfort of home or on the go. The system can adapt based on user input that farmers can enter through smart farming applications. All sensors are mounted on an Arduino Uno R3 microcontroller board. This board acts as his IOT gateway for the developed system as it has the ability to transfer data to the cloud. This transmission is done through the Wi-Fi ESP8266 module.

4. Smart Farming System using IoT for Efficient Crop Growth

M. S. D. Abhiram, J. Kuppili and N. A. Manga, "Smart Farming System using IoT for Efficient Crop Growth," 2020 IEEE International Students' Conference on Electrical,Electronics and Computer Science (SCEECS), 2020, pp. 1-4, doi: 10.1109/SCEECS48394.2020.147.

This paper proposes Smart Farming System using IoT for Efficient Crop Growth. The system uses several sensors that indicate soil moisture content, local humidity and temperature, and a rain detection sensor that can be used to determine if crops are suitable for cultivation. All these sensors are connected to the internet and smart phones along with a NodeMCU.

Some crops grow only in certain weather conditions, while others yield only in certain temperature ranges. A raindrop sensor measures the intensity of rain. When enough rain falls to provide the soil with the water it needs, the plants become dehydrated. When the plants don't have enough water even after it rains, turn on the DC motor to re-pump the water. Data reaches his Blynk cloud on NodeMCU via Wi-Fi from the Wi-Fi module located in NodeMCU. The data is then relayed to his Blynk app on a smartphone, where users can check humidity, temperature and soil moisture, and receive notifications when it's raining or when his DC motor is on. I can. From this app the farmer can control his DC motor using various buttons and switches. When NodeMCU receives a command from the app, it performs the appropriate parsing and he controls the DC motor.

With this system, enough water is pumped and rain is used efficiently. This system is very useful for farmers as they need to pump water regularly and check the condition of each crop.