**Smart Farmer - IoT Enabled Smart Farming Application**

# Problem Statement

Internet of Things is the future of every field impacting everyone’s life making everything intelligent. It is a network of different devices which make a self-configuring network. The new developments of Smart Farming with the use of IoT, by day, turning the face of conventional agriculture methods by not only making it optimal but also making it cost efficient for farmers and reducing crop wastage. The aim is to propose a technology that can generate messages on different platforms to notify farmers. The product will assist farmers by getting live data (Temperature, humidity, soil moisture, UV index, IR) from the farmland to take necessary steps to enable them to do smart farming by also increasing their crop yields and saving resources (water, fertilizers).

# Literature Review

The most researched area of IoT is agriculture. Because it is a really crucial sector to ensure food security as the global population is increasing rapidly. Researchers first started applying ICT-based techniques in this sector, which were useful on some levels but definitely were not going to solve our problem in long run. So now, they are exploring IoT as an option to ICT in agriculture. Agriculture products need applications like soil moisture monitoring, environmental condition monitoring for temperature, and moisture, supply chain management, and infrastructure management. [1].

The trend of urbanization is forecasted to continue at an accelerated pace, with about 70% of the world’s population. Furthermore, income levels will be multiples of what they are now, which will drive the food demand further, especially in developing countries. As a result, these nations will be more careful about their diet and food quality [2].

The newer scenario of decreasing water tables, drying up of rivers and tanks, and unpredictable environment present an urgent need for proper utilization of water. To cope with this use of temperature and moisture sensors at suitable locations for monitoring of crops is implemented. An algorithm developed with threshold values of temperature and soil moisture can be programmed into a microcontroller-based gateway to control water quantity. The system can be powered by photovoltaic panels and can have a duplex communication link based on a cellular internet interface that allows data inspection and irrigation scheduling to be programmed through a web page [3].

the user has to feed the data about the land area and the type of crop planted in the app. With the given data we can calculate the amount of water, fertilizers, pesticides needed for the given land area[4].

When the soil is dry, the current will not pass through it and so it will act as open circuit. Hence the output is said to be maximum. When the soil is wet, the current will pass from one terminal to the other and the circuit is said to be short and the output will be zero. A well-controlled irrigation system is one which is most advantageous for farmers and maximize the benefit cost ratio. This system will help in better control of landscape and irrigation needs as well as peace of mind that the smart system can make decision independently if person is away [5].

Sensor devices are specially designed to operate in open environments, in nature, in soil, water, and air to measure and collect environmental parameters that affect production, such as soil nutrients, humidity, temperature, etc. Smart farming solutions are agricultural operations that are often deployed on large farmlands, outdoors, so the devices that support solutions need some unique characteristics, such as the ability to withstand the effects of weather, humidity, and temperature instability throughout their service lifecycle[6].

The predictable database system now has not enough parking space to store the facts from the IoT sensors. In the clever agriculture machine, the cloud based mainly on facts garage and a stop-stop IoT platform play an important part. These structures are expected to play a vital role in finishing higher sports. In the IoT universe, sensors are the main source of massive facts. The numbers are analyzed and the use of analytical equipment is converted into meaningful facts. The analytics of records helps to evaluate temperature, farm animal conditions, and crop situations. The statistics collected use the technical advances and make better decisions for this purpose. [7]

Libelium is a platform (hardware and software) used in IoT solutions systems and it is based on wireless sensor networks. Libelium expertise involves a new vineyard project developed with Libelium IoT platform on Agrotech, new weather station sensors for maximum accuracy, monitoring “baby leaves” fourth-generation vegetable production for efficient use of fertilizers and irrigation [8].

Due to the weather condition, water level increasing Farmers get lot of distractions which is not good for Agriculture. The water level is managed by farmers in both Automatic/Manual using that mobile application. It will make more comfortable to farmers. [9]. IoT is regarded as key component for Smart Farming as with accurate sensors and smart equipment’s, farmers can increase the food production by 70% till year 2050 as depicted by experts. 3. With IoT productions costs can be reduced to a remarkable level which will in turn increase profitability and sustainability [10].

# References

[1] Jash Doshi, Tirthkumar Patel, Santosh kumar Bharti, Smart Farming using IoT, a solution for optimally monitoring farming conditions,on 2019

[2] MUHAMMAD AYAZ 1 , (Senior Member, IEEE), MOHAMMAD AMMAD-UDDIN 1 , (Senior Member, IEEE), ZUBAIR SHARIF2 , ALI MANSOUR3 , (Senior Member, IEEE), AND EL-HADI M. AGGOUNE1 , (Senior Member, IEEE), Internet-of-Things (IoT)-Based Smart Agriculture: Toward Making the Fields Talk,on sep 2019

1. Nikesh Gondchawar1 , Prof. Dr. R. S. Kawitkar, IoT based Smart Agriculture,on jun 2016
2. Jayakumar R, Karthikeyan S N, Karthikeyan S N, Methini M, SMART AGRICULTURE USING IoT,on jun 2019.
3. Snehal S. Bansod1 , Radhika V. Hande2 , Payal H. Ale3 , Shubhang R. Jibhkate, Prof. Anshu Chaudhary, Prof. Prakash Mohod, Smart Agriculture Monitoring System Based on Iot, On 2019.
4. Vu Khanh Quy 1 , Nguyen Van Hau 1 , Dang Van Anh 1 , Nguyen Minh Quy 1 , Nguyen Tien Ban 2 , Stefania Lanza 3 , Giovanni Randazzo 4 and Anselme Muzirafuti, IoT-Enabled Smart Agriculture: Architecture, Applications, and Challenges, march 27.
5. Dankan Gowda .V1 , Sandeep Prabhu M2 , Ramesha. M3 , Jayashree M Kudari4 and Ansuman Samal5, Smart Agriculture and Smart Farming using IoT Technology, On 2021
6. Ioana M. Marcu, George Suciu, Cristina M. Balaceanu, Alexandru Banaru, IoT based System for Smart Agriculture, On jun 2019

[9] Ritika Srivastava1, Vandana Sharma2, Vishal Jaiswal3, Sumit Raj, A RESEARCH PAPER ON SMART AGRICULTURE USING IOT,On July 2020

[10] Anand Nayyar, Er. Vikram Puri, Smart Farming: IoT Based Smart Sensors Agriculture Stick for Live Temprature and Moisture Monitoring using Arduino, Cloud Computing & Solar Technology, On nov 2019