A SURVEY PAPER ON SMART FARMING - IoT ENABLED SMART FARMING APPLICATION

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ABSTRACT

The interest of things, or IoT, is a system of interrelated computing devices ,mechanical and digital machines, objects ,animals or people that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.

IoT in agriculture uses robots, drones, remote sensors, and computer imaging combined with continuously progressing machine learning and analytical tools for monitoring crops, surveying, and mapping the fields, and providing data to farmers for rational farm management plans to save both time and money.
IoT platform that helps farmers to connect all their devices (weather station, irrigation system, soil moisture sensor, etc.) to the internet and manage them through a single dashboard. With the IoT platform, farmers can: monitor in real-time the status of all their devices and equipment.

1. INTRODUCTION:

The Internet of Things is a developing theme of specialized, social, and monetary centrality. Customer items, tough goods, cars and trucks, modern and utility segments, sensors, and other regular articles are being joined with Internet availability and amazing information systematic capacities that guarantee to change the manner in which we work, live, and play.

Projections for the effect of IoT on the Internet and economy are amazing, with some foreseeing upwards of 100 billion associated IoT gadgets and a worldwide financial effect of more than $11 trillion by 2025. The Internet of Things (IoT) is an essential theme in innovation industry, strategy, and designing circles [1]. This innovation is encapsulated in a wide range of arranged items, frameworks, and sensors, which exploit headways in processing power, gadgets scaling down, and organize interconnections to offer new capacities.

The expansive scale usage of IoT gadgets guarantees to change numerous parts of the manner in which we live. For shoppers, new IoT items like Internet-empowered machines, home mechanization parts, and vitality the executive's gadgets are pushing us toward a dream of the "savvy home", offering greater security and vitality effectiveness. IoT frameworks like arranged vehicles, savvy traffic frameworks, and sensors implanted in streets and scaffolds draw us nearer to "brilliant urban areas", which help limit clog and vitality utilization.

IoT innovation offers the likelihood to change horticulture, industry, and vitality creation and dissemination by expanding the accessibility of data along the esteem chain of generation utilizing arranged sensors.

2. LITERATURE SURVEY:

Climate Monitoring & Automatic Irrigation over IoT

This project proposed the most common problem experienced in our day- to- day lives that is regarding about agriculture. To minimize problems IoT-based smart farming is developed. Smart farming is a system is built for monitoring the crop field with the help of sensors (light, humidity, temperature, soil moisture, etc.) and automating the irrigation system. The farmers can monitor the field conditions from anywhere.

Usage of Sensors, Smart Alerting and Prediction Using IoT

IoT is an expanding network of physical devices that are linked with different types of sensors and with the help of connectivity to the internet; they are able to exchange data. Through IoT, internet has now extended its roots to almost every possible thing present around us and is no more limited to our personal computers and mobile phones. Safety, the elementary concern of any project, has not been left untouched by IoT. Increasing control over production leads to better cost management and waste reduction. The ability to trace anomalies in crop growth or livestock health, for instance, helps eliminate the risk of losing yields. Additionally, automation boosts efficiency

3. SENSORS USED:

• Arduino Uno

The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc and initially released in 2010.The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The board has 14 digital I/O pins (six capable of PWM output), 6 analog I/O pins, and is programmable with the Arduino IDE (Integrated Development Environment), via a type B USB cable.

• Temperature sensor

A temperature sensor is a device that detects and measures hotness and coolness and converts it into an electrical signal. Temperature sensors work by providing readings via electrical signals. Sensors are composed of two metals that generate an electrical voltage or resistance when a temperature change occurs by measuring the voltage across the diode terminals.

• Soil moisture sensor

This IoT system monitors the soil moisture using Arduino and sensors. Data coming from sensors is sent to a cloud platform. Moreover, this Arduino IoT system implements a notification system so that when the soil gets too dry it sends a notification. Soil moisture sensors measure the water content in the soil and can be used to estimate the amount of stored water in the soil horizon. Soil moisture sensors do not measure water in the soil directly. Instead, they measure changes in some other soil property that is related to water content in a predictable way.

- ## <u>Humidity sensor</u>

  Humidity sensors are electronic devices that measure and report the moisture and air temperature of the surrounding environment where they are deployed e.g., in air, soil, or confined spaces. Humidity measurements indicate the concentration of water vapor presented in the air

4. APPLICATIONS:

- ## <u>Crop Monitoring</u>

  Sensors placed along the farms monitor the crops for changes in light, humidity, temperature, shape, and size. Any anomaly detected by the sensors is analyzed and the farmer is notified. Thus remote sensing can help prevent the spread of diseases and keep an eye on the growth of crops.

- ## <u>Weather conditions</u>

  The data collected by sensors in terms of humidity, temperature, moisture precipitation, and dew detection helps in determining the weather pattern in farms so that cultivation is done for suitable crops.

- ## <u>Soil quality</u>

  Soil health analysis helps in determining the nutrient value and drier areas of farms, soil drainage capacity, or acidity, which allows to adjustment of the amount of water needed for irrigation and the opt most beneficial type of cultivation.

- ## <u>Remote sensing in agriculture</u>

  Remote sensing in agriculture is revolutionizing the way data is acquired from different nodes in a farm' IoT-based remote sensing utilizes sensors placed along with the farms like weather stations for gathering data, which is transmitted to analytical tools for analysis. Sensors are devices sensitive to anomalies. Farmers can monitor the crops from the analytical dashboard and take action based on insights.

Benefits:

- ➢ Reduction of risks.

- ➢ Business goes automated.

- ➢ Higher quality.

- ➢ Livestock monitoring.

- ➢ Monitoring climate conditions.

- ➢ Greenhouses automation.

- ➢ No physical equipment required to be placed on farms

- ➢ Crop monitoring.

- ➢ Highly skilled labor not required

- ➢ No hardware maintenance costs

> ➢ Insights are accessible on laptop or PC screens and data is stored in the cloud

> ➢ Yearly or monthly subscription plans available at low cost, low risk investment

5. CONCLUSION:

From our results and literature survey of other papers, we used to develop our porotype allowed us to make an efficient and accurate, as well as affordable product for farmers. Which was economical and easily installable for farmers as well. Thus, we can conclude that this porotype will definitely help farmers in small farmland to effectively monitor their crops with the user-friendly app and other alert means.

6. REFERENCES:

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