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Smart advanced agriculture system in India using IoT technology

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***Abstract*---**The current work focuses on the need for automation in agriculture through IoT technology. Automated farming aims to monitor and control various parameters that can help increase agriculture productivity. The proposed system provides a technical solution to a variety of problems such as water demand, humidity, temperature and humidity of complex plants, fire warning and maintenance check on unwanted agricultural inputs including timely and adequate electricity supply. In the proposed system a Wi-Fi module is used that automatically notifies the alert and unwanted stay or sign-in display of real-time data that can be seen and accessed online using IoT technology from anywhere in the world. The system is equipped with a solar panel that provides conditions for different environmental forces and the performance of various sensors is available to meet your desired expectations.

***Keywords*---**agriculture automation system, internet of things, agriculture sensors.

Introduction

Smart agriculture is the implementation of various technologies and devices such as the internet, cloud and IoT devices. As in today's world, the population is growing and is expected to be around 9.7 billion by 2050 feeding the billions of people we need to improve agricultural production. The population is increasing and on the other hand, the agricultural land is decreasing due to various reasons such as industrial construction, commercial markets and residential buildings created in these agricultural areas to feed these billions we need to increase productivity and this can be done through IoT in agriculture[1]. Smart farming is also known as precision farming. In such circumstances, water use is mainly made up of freshwater resources for agriculture. request for food. It requires planning and strategies to use water responsibly through advances in science and technology. There are many programs to achieve water conservation in a variety of crops, from basic technologies to advanced technologies[2].

One of the existing systems uses thermal thinking to monitor plant water quality and irrigation planning. Automation of irrigation systems is also possible by measuring the groundwater level and controlling actuators to irrigate where needed instead of setting an irrigation schedule, thus saving and using water in a rational way. Irrigation control is used to open the solenoid valve and to irrigate bed plants (impatiens, petunia, salvia and vincarosea) when the volumetric water content of the growing medium drops below the set point.In the current situation the fruits of the crop are not enjoyed by farmers for a variety of reasons such as pest infestation, plant diseases, lack of proper knowledge of important plant ingredients and there are various other obstacles[3]. To remove these barriers and make farming more profitable and prudent and more friendly to farmers who need ittechnological advances.

Objective

Our main goal is to model a time-sensitive crop monitoring system for soil structures such as temperature, humidity, pH and to use decision-making methods, plant diagnostics using image analysis and SMS alerts. It will also be able to control various field operations remotely from anywhere, at any time via mobile and web application using IoT devices.

Literature Review

Modern agricultural challenges, such as declining soil quality, increasing grain loss in Food Corporation of India, and extinction of endangered species and their seeds, require urgent attention and smart farming practices with technology. peak. In [4], an intelligent irrigation system is established using a soil temperature and humidity sensor. The proposed system significantly saves water by allowing irrigation of the field at the right time and minimizing human intervention. The main advantage of this program is that it can be used for agricultural methods where the key indicators are low population and dry climate. This can be very useful for emerging farmers, who have just started their work and want their work done cheaply. Looking at [5], the authors described the implementation of an automated irrigation system. This automated system has

proven to be very expensive and available to make water more resource in the agricultural sector. This automated system can be used in areas with low rainfall and low irrigation water to improve the sustainability of the agricultural process. In reference [6], the authors introduced a measurement network for a wireless measurement network. This includes multiple sensor nodes, transmission nodes, and base nodes. The operating frequency of the system is located at 433 MHz, which is likely to transmit information from underground. The low cost and careless use of power make it ideal for large-scale use. According to reference [7], the discussion of a tenacious irrigation system to an electrically controlled system for each irrigation spray was discussed. Here, the use of GPS is used for continuous navigation monitoring. The authors also present details on the wireless connection between the sensors connected to the spot and the logic controller which can be programmed to control. Other implementations of Bluetooth wireless technology have been used in this document, which provide a plug-and-play communication module[8]. This Bluetooth wireless technology also has the advantage of saving time and money by using easily accessible sensors and controls using direct communication ports.

Indian Agricututre Farming System

Existing Problem In Indian Agrivulture Farming System

a) Areas such as Punjab, which receive a lot of water through irrigation systems in rivers and canals, suffer from salinity in the soil due to over-irrigation. Areas with limited water resources, such as Rajasthan, are facing water shortages in agriculture[9].
b) Different plants require different amounts of moisture, humidity, temperature and wavelength, and a lack of awareness of this knowledge or the negligence of the soil cultivator can cause the plants to die before ripening.
c) Excessive use of fertilizers, pesticides and pesticides makes the soil dependent on them, destroys fertility, increases resistance to pests and insects, pollutes groundwater and nearby wetlands whenever it rains.
d) Once the harvest is ripe, farmers are once again exploited by insiders in the Agricultural Product Marketing Committee (APMC) (mandis) because cash trucks are acquired by local workers and farmers are forced to sell their produce at a disposal price especially during the Zaid season. when they grow rotting vegetables and fruits.

Technical Solution for Indian Agricuture System

IoT works much better compared to the conventional method. IoT system providers continue to develop interactive platforms, and hear precisely measured environmental data to help improve farm performance. The range of technology behind these IoT platforms includes drones, LED lights, power harvesters, transmitters, microcontrollers etc. We have some solutions after adopting IoT in the agriculture farming system.

Water management in large agriculture area

The water volume sensor is an IoT tool that will keep track of the water volume flowing through the pipe and if we supply more water than necessary it will lead to improper production and water wasting there too[10]. This water volume sensor device sends information on the server and the server will perform the required action such as turning off the pump etc.

Climate monitoring and greenhouse agriculture farming

IoT climate monitoring is probably the most popular among farmers. As the devices are integrated with intelligent farming sensors and collect various data from nature and send it to the cloud to record the weather[11]. With the help of this data, farmers select suitable crops and take the necessary measures to improve crop yields.

Integrated pest control and management

Once the IoT system is implemented, farmers will be able to easily monitor biodiversity and make informed decisions. In contrast to development, IoT farming is a much-needed new venture that, if done well, will help farmers overcome all the challenges they face in agriculture. Furthermore, the rich data from Sensitive Nerves helps to create greater awareness among farmers about the use of pesticides and fertilizers[12], thus reducing environmental impact. Monitoring the IoT system for plants and soil conditions is an easy-to-use method, but using sensory technology can produce dramatic returns on investment for farmers.

Livestock Monitoring

Owners of large farms can use the applications of the IoT wireless system to gather information about the location, health and well-being of their cattle. And this helps them to identify sick animals so that they can be separated from the herd, thus preventing the spread of disease. Reduce labour costs as farmers can afford to get their cattle with the help of IoT based Sensors.

Internet of things

The Internet of Things is a technological revolution that represents the future of computer and communications, and its growth is dependent on powerful technologies in a number of important fields, from wireless sensors to nanotechnology[13]. First of all, to connect everyday objects and devices to big data and networks, and to the Internet (Internet) a simple, unobtrusive and inexpensive system of identification is essential.

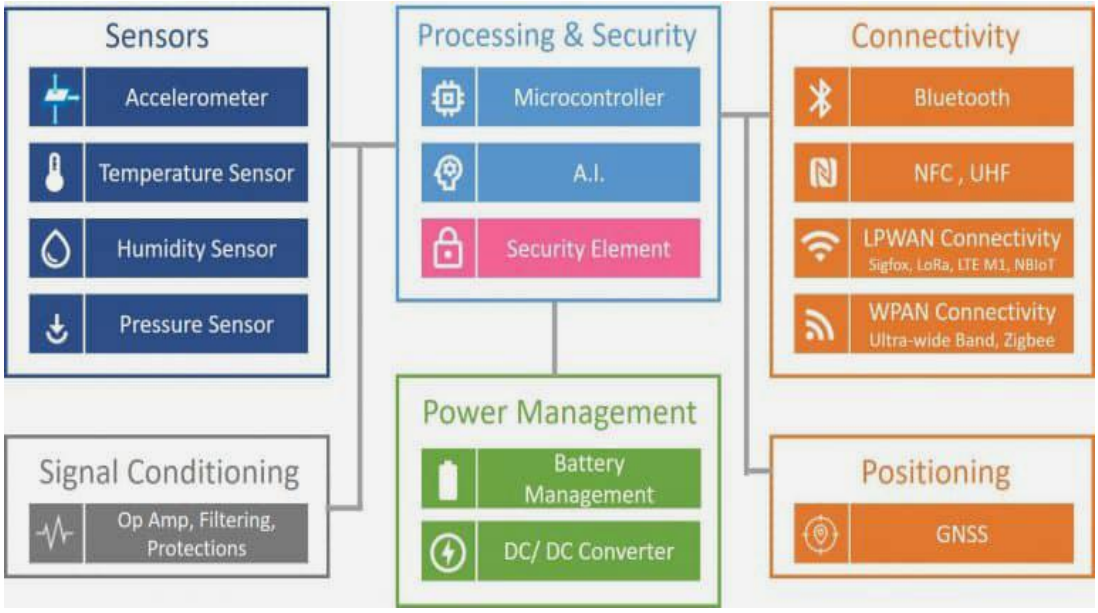

Figure 1: Smart Agriculture Farming System Using Internet Of Things

By connecting, the processor is able to control other IoT devices remotely. Various sensors can be used to detect external environment and target objects. Many agricultural applications are available through the IoT system, such as precise farming, crop management, automatic farming practices (such as fertilizer application, irrigation, or pest management), livestock monitoring,[6] and so on.

Benefits of implementing IoT in agriculture farming system

A. The entire IoT ecosystem is made up of sensors that can detect real-time weather conditions such as humidity, rainfall, temperature and more accurate weather[14].
B. To optimize our seedling storage areas, the IoT system allows weather stations to automatically adjust the weather conditions according to a specific set of instructions. Adoption of the IoT method in the nursery eliminates human intervention, thus making the whole process more expensive and at the same time increasing accuracy[15].
C. IoT solutions focus on increasing the utilization of resources such as water, energy, and land. Precise farming using the IoT method relies on data collected from various sensors in the field, which enables farmers to truly share sufficient resources within a crop[16].
D. In the agricultural industry
E. IoT helps farmers maintain crop quality and soil fertility, thereby increasing productivity and product quality in agriculture.
F. IoT system solutions present automation, for example, irrigation-based irrigation, fertilizer application and robotic harvesting.

Conclusion

IoT-based smart devices should have a unique identity, and should have the ability to communicate and communicate, with other organizations in the network, and web-based platforms. Many technologies and standards have been proposed to achieve the IoT vision, and the interaction of various businesses is a major challenge in the area. The use of IoT in the agricultural industry has helped farmers to monitor water tank levels in real time making the irrigation process more efficient. In India, the biggest problem in agriculture is the shortage of agricultural workers and the unprofitableness of farmers due to low profit. Some states have begun using the latest farming tools to pay for labor and increase profits. There is an excellent scope for using modern technology in agricultural technology to maximize profits. The use of IoT in agriculture can improve the lives of Indian farmers. This paper describes an intelligent agricultural system in the three ways proposed above using IoT. Automation using IoT reduces manual labor and aims to control financial losses.The development of IoT in agricultural activities has brought about the use of nerves in all stages of the farming process such as how long the seed takes and the resources to become a fully grown crop.

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