IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 3, Issue 2, January 2023
Impact Factor: 7.301

Contrasting Journal on Agriculture Systems Using the Internet of Things

Miss. Prasanna T. Karale[1] and Prof. Seema Rathod[2]
Department of Computer Science and Engineering, Sant Gadge Baba Amravati University, Amravati, India[1]
Professor , Department of Computer Science and Engineering, Sant Gadge Baba Amravati University, Amravati, India[2]
karadeprasanna@gmail.com[1] and omseemarathod@gmail.com[2]

Abstract: *Agriculture is being rebuilt by the Internet of Everything (IoT) Temperature, humidity, and soil fertility are monitored using remote sensors. A field interruption, exact location, and wild plant species can all be found through an IOT-based investigation. The same wireless sensors may be used to monitor the soil's pH rate, temperature, and water level. A distributed wireless network of soil moisture and temperature sensors placed in plant root zones make up the implementation, of an automated watering system powered by solar panels. The Arduino board, which serves as an IoT gateway, receives data from these sensors, which continually monitor the settings, and processes it. A smartphone app gives customers access to live sensor data and enables farmers to take appropriate steps to meet the needs of the land. Farmers can use robotic systems for pesticide spraying, cultivating, and other such activities. Shows a block diagram of proposed concepts for an Internet of Things system.*

Keywords: IoT, Agriculture

I. INTRODUCTION

Today's large and small farms, for instance, can use IoT to remotely location manage and control their connected smart extractors and irrigation equipment, monitor sensors that can measure soil water, crop growth, and livestock feed levels, and use artificially intelligent analytics to quickly analyse sets blended to third part knowledge, such as climate services, to provide fresh insights and enhance decision making. The agricultural sector is undergoing a revolution due to the Internet of Things (IoT), which is also helping farmers overcome significant challenges. The company must manage difficult cost management, escalating water shortages, a lack of suitable land, and the requirements of a population that is anticipated to grow by 70% by the year 2050. [1]India has agriculture as its primary occupation. 58% of the people living in rural areas in India are dependent on agriculture. It is estimated that agriculture uses 85% of available freshwater resources worldwide. This percentage will continue to be dominant because of population growth and increased food demand. [2]

Agriculture is being rebuilt by the Internet of Everything (IoT), allowing farmers to overcome obstacles in the field. Temperature, humidity, and soil fertility are monitored using remote sensors. A field interruption, exact location, and wild plant species can all be found through an IOT-based investigation. [3] The Internet of Things is made up of two words. Internet of things is the full name of the term. The Internet of Things (IoT) refers to a network of actual objects with sensors, software, and other modern technology. These gadgets collect information and transmit it to other linked gadgets. This system can share data over a network without requiring individual-to-human or human-to-computer interaction. IoT is widely used in agriculture. It has a massive effect on how our nation's economy develops. [6]

II. LITERATURE REVIEW

The project's goal is to create a system that can track the whereabouts of cardiac patients while also keeping track of their blood pressure, heart rate, and temperature and sending out alerts in case to predetermined numbers via SMS in case of an emergency. [1]The automation of several agricultural chores has been suggested using a smart agriculture system based on GSM. A smart irrigation system that operates on a mechanical bridge slider arrangement proposes automation. Through a GSM module, the smart irrigator gets signals from the sensing system. The sensed data is sent to a central database to create automatic activities and processes. [2]The main theme of this project is to design and develop a low-cost wireless data logging system with 32-bit embedded microcontroller. The temperature sensor

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 3, Issue 2, January 2023
Impact Factor: 7.301

transmits specific temperature variations to the central processing device within the range. The central base station collects and stores the data in the file and simultaneously tracks the variations. [3]Also with aid of smart agricultural technology, farmers may better manage the process of raising crops and livestock. In doing so, it achieves enormous economies of scale, lowers expenses, and conserves precious resources like water. From the amount of fertilizer to the number of trips made by farm vehicles, it can decrease waste and boost productivity. [4]Numerous research publications concentrate on water optimization to help farmers use automated irrigation systems to save money and energy. A distributed wireless sensor network for diverse agricultural activities is also a part of the system. The ZigBee protocols, Arduino UNO, and Raspberry Pi exchange measurement data for the irrigation method.[5][7] Smart agriculture refers to the application of cutting-edge technologies, such as sensors, remote sensing, GPS, GIS, robots, and many others, to improve crop quality. By deploying such a system in the field, farmers can easily apply smart farming and collect real-time data on a variety of gadgets, including smartphones, computers, and tablets.[6]

2.1 Literature Survey Table

Author Name	Paper Title & Publishing Year	The goal of the Existing System
E. Sowmya, S. Sivaranjani	"IoT-based Smart Soil Monitoring System for Agricultural Production"2017.	Due to a lack of enthusiasm, a shortage of agricultural area, and a lack of water, farming is greatly reduced in our country. This paper explains the processing and cloud storage of sensed data. Through their pH One or device, registered farm owners will receive data in a format that is easy to interpret.
G. Sushant and S. Sujatha	"IoT-Based Smart Agriculture System" 2018	It is suggested in this paper to create a system that can track changes in temperature, humidity, wetness, and even animal activity. The key to increasing the production of productive crops is to keep an eye on the environment. The technology has the potential to be helpful in geographically remote, water-scarce places.
Swaraj C M And K M Sowmyashree	IoT-based Smart Agriculture Monitoring and Irrigation System 2020	The agribusiness that involves farmers is changing thanks to the Internet of Things (IoT). Remote sensor systems are utilized to monitor the conditions at home, and scope controllers are used to regulate and motorizing the fields. For farmers, IoT advancement can lower costs and boost the effectiveness of standard creation.
Durgesh Raghuvanshi, Apurva Roy, Dr. Vaibhav Panwar	IoT-Based Smart Agriculture System - 2021	The idea of extending an agribusiness platform to the internet is discussed in this essay. The most crucial aspect of human life is agriculture, which may be improved by utilizing IoT technology. The technology has the potential to be helpful in remote, water-scarce places. The key to increasing productive crop production is monitoring the environment.
Dr. V. Suma	Internet of Things (IoT) based Smart Agriculture in India: An Overview – 2021	Improved production is necessary to meet the growing demand for food across many industries, especially in agriculture. A superior choice for increasing food production, resource management, and labour is smart agriculture. Predictive analysis, Internet of Things (IoT) devices with cloud administration, and security units for multi-culture in the agriculture industry are all covered in this study.
Baldev Kaur, Vipul Singh, Manthan Chaudhary, Ayush Kumar	IoT-Based Smart Agriculture Monitoring System – 2022	For many decades, agriculture has been the primary occupation in our nation. Today's farmers, however, confront a variety of issues, including soil and water erosion, a lack of modern technology and equipment, subpar irrigation, inadequate storage facilities, etc. To solve this issue, we have implemented IoT-based smart agriculture approaches.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 3, Issue 2, January 2023
Impact Factor: 7.301

III. IoT IMPLEMENTATION IN THE AGRICULTURE FIELD

Easily collect and manage the explosion of data from sensors, cloud services such as weather or maps, connected equipment, and existing systems. Quickly build and bring to market new innovative IoT applications at 10 times the speed of other approaches with our rapid application development environment and drag-and-drop mash builder [1].An IoT-based smart agricultural system is being used by farmers in India to monitor their crops and control irrigation. While the information is distributed on-the-fly, the processing is done in the cloud.[2].The application of the Internet of Things (IoT) in farming increases productivity from a low to a high rate, which is a result of effective farming. A 75% agricultural production rate keeps farmers' earnings high despite the limitations of technology. [4] The use of IoT in agriculture encourages high production from a lower to a higher rate, which is a result of good farming. The Internet of Things cloud is essential for both supplying and transporting data between devices. The storage is kept distinct for each analysis, including those involving sensor output, item recognition, plant diseases, and predictive big data analysis.[5][8]

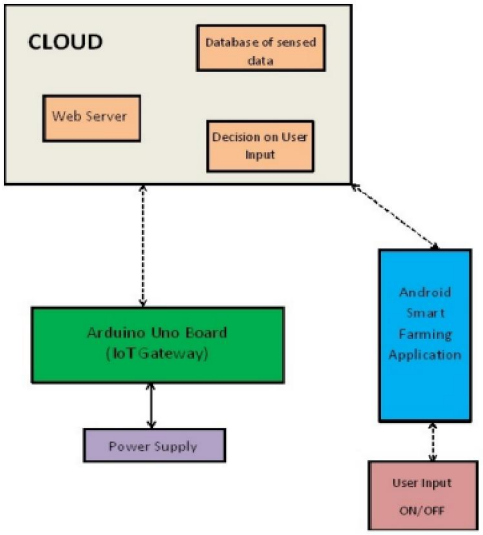

Figure 1: IoT Implementation in the Agriculture Field

IV. METHODOLOGY

This project aims to create a system that can send SMS notifications to predetermined numbers while tracking the number of soil resources and monitoring PH rate, water level, and temperature. [1]additionally, it seeks to load a predictable irrigation schedule at the farmers' convenience into the corresponding application. A photovoltaic-powered automatic watering system powers the system. [2]Each section's sensor network will be linked to the cloud by a WIFI communication module. Analysis and alert to any changes that can set off an alarm for the area will be done using the data kept in the cloud called ThingSpeak.[3] An IoT system proposed model demonstrates how sensors, processors, and applications are connected. The microcontroller and sensors are connected, and the user's mobile app shows data from the sensor. Robotic systems can be used on farms to spray pesticides, harvest crops, cultivate ate land, and perform other similar tasks.[4] All the other sensor technology is being included in IoT devices. An Internet of Things central processing unit processes the sensor data produced from raw data collected from soil or other relevant locations. The system's audio and video interfaces are made to be user-friendly and instinctive for both people and animals.[5][7]

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 3, Issue 2, January 2023
Impact Factor: 7.301

4.1 Methodology Table

Author name	Paper Title & Publishing Year	Methodology
E. Sowmya, S. Sivaranjani	"IoT-based Smart Soil Monitoring System for Agricultural Production"2017.	This project's goal is to develop a system that can track the number of soil resources, monitor PH rate, water level, and temperature, and deliver SMS notifications to predefined numbers.
G. Sushant, S. Sujatha	"IoT-Based Smart Agriculture System" 2018	It aims to add a predictable watering schedule to the appropriate application at the farmers' convenience. The system is powered by a solar automatic watering system.
Swaraj C M, K M Sowmyashree	IoT-based Smart Agriculture Monitoring and Irrigation System - 2020	A WIFI connection module will be used to connect the sensor networks in each part to the cloud. The data stored in the cloud called Thing Speak will be used for analysis and alerting to any changes that could set off an alarm for the area.
Durgesh Raghuvanshi, Apurva Roy, Dr. Vaibhav Panwar	IoT-Based Smart Agriculture System - 2021	The connection between sensors, processors, and applications is shown in an IoT system proposed model. The user's mobile app displays data from the sensor after the microcontroller and sensors are linked. On farms, robotic systems can be employed for a variety of comparable duties, including spraying pesticides, harvesting crops, cultivating land, and more.
Dr. V. Suma	Internet of Things (IoT) based Smart Agriculture in India: An Overview – 2021	IoT devices now integrate all other sensor technologies. The sensor data generated from the raw data gathered from the soil or other pertinent areas are reprocessed by an Internet of Things central processing unit.

V PROPOSE A SYSTEM

I have examined a variety of papers, but I found the 2017 paper titled "Smart System Monitoring on Soil Using Internet of Things (IoT)" by E. Sowmya and S. Sivaranjani to be the most informative and understandable.

Through a wireless network, farmers may monitor the soil's pH, pH, water level, and temperature from their smartphones. They arc promptly identify any soil irregularities and employ insecticides to eradicate them. The project's goal is to create a system that can track soil resources by sending SMS notifications to predetermined numbers.

5.1 Architecture of the System

The sensors are linked to a 33-pin-bit C microcontroller. The supply output and ground connections are located on its three pins. With pH, we can measure the pH level by burying a sensor in the ground for a minute. With an output value corresponding to the Celsius temperature, the temperature is monitored using the LM35, a high-precision integrated circuit temperature sensor.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 3, Issue 2, January 2023
Impact Factor: 7.301

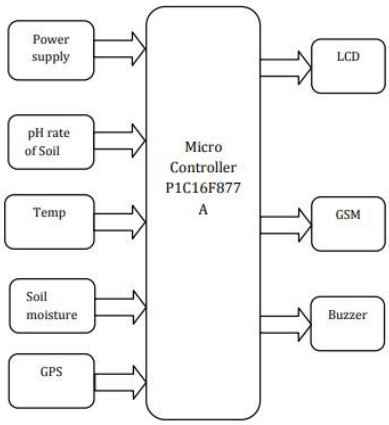

Figure 2: Block Diagram of Smart Farm Monitoring System

VI. PARAMETER USE IN

- **Temperature and Humidity Sensor**: As soon as the board is turned on, it begins to display the precise temperature and humidity in that location. As a result, this sensor aids in sensing humidity and temperature.
- **Sensor for Soil Moisture:** This sensor aids in determining the precise level of soil moisture. The motor will automatically start if the moisture content is less than 40%. The motor will immediately stop if the moisture content exceeds that level. The amount of water in the soil is essentially measured by its moisture content. A soil moisture conducting a probe that serves as a probe can be used to measure this.
- **Fire Sensor**: This sensor begins to function when the ambient temperature reaches 37 degrees. It gives the user the essential information and outputs 1 if it senses a fire.When a forest fire occurs, the flame sensor detects an increase in the ambient temperature, and the relay switch activates the water pump. The water pump stops working when there isn't any flame.

VII. FUTURE SCOPE

- **Efficiency**: Farmers can monitor their products and conditions in real-time thanks to IoT-enabled agriculture. They can identify problems before they arise, gain insights quickly, and decide on the best course of action to take to prevent them. IoT solutions for agriculture also include automation, such as demand-based irrigation, fertilization, and robot harvesting. To expand: 70% of the world's population, when it reaches 9 billion, will reside in cities.
- Hydroponic and IoT-based greenhouses allow for quick food supply chains and should be able to feed the world's population. Smart closed-cycle agricultural systems make it possible to grow food anywhere, including inside shipping containers, on the walls and rooftops of skyscrapers, and, of course, in the convenience of every person's own home.
- **Reduction of Resources:** The best use of resources, including water, energy, and land, is the main goal of many IoT systems. The data gathered from various field sensors used in precision farming is what enables farmers to precisely allocate the right amount of resources within a plant.
- **The process That is Clear:** The use of pesticides and fertilizer is greatly reduced thanks to IoT-based precision farming technologies, which also assist farmers in conserving water and energy and making farming more environmentally friendly. Compared to conventional agricultural approaches, this strategy enables generating a cleaner and more organic final product.
- **Agility**: The enhanced agility of the operations is one advantage of implementing IoT in agriculture. Farmers are now able to react swiftly to any significant changes in the weather, humidity, air quality, and the condition of each crop and the soil in the too well genuine surveillance and forecast systems. Professionals in agriculture are helped by new capabilities to rescue crops in the event of harsh weather changes.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 3, Issue 2, January 2023
Impact Factor: 7.301

- **Product Quality Improvement**: - Data-driven agriculture encourages the production of more and better crops. Farmers are better able to grasp the intricate relationships between crop quality and environmental circumstances because of the use of soil and agricultural detectors, airborne UAV collecting data, and farm mapping. They may duplicate the ideal circumstances and raise the nutritional content of the goods by using linked systems.

VIII. CONCLUSION

Agriculture is being rebuilt by the Internet of Everything (IoT). Temperature, humidity, and soil fertility are monitored using remote sensors. A smartphone app gives customers access to live sensor data and enables them to take appropriate steps. Farmers can use robotic systems for pesticide spraying, cultivating, and other such activities. India has agriculture as its primary occupation.

58% of the people living in rural areas in India are dependent on agriculture. Temperature, humidity, and soil fertility are monitored using remote sensors. A field interruption, exact location, and wild plant species can all be found through an IoT-based investigation.

REFERENCES

[1]. E.Sowmiya1, S.Sivaranjani 2. "SmartSystemMonitoringOnSoilUsingInternetofThings (IoT)", Volume: 04 Issue: 02 | Feb -2017.

[2]. G. Sushanth1 and S. Sujatha2. "IoT Based Smart Agriculture System", c 2018 IEEE.

[3]. Swaraj C M (PG Student), K M Sowmyashree (Assistant Professor), "IoT Based Smart Agriculture Monitoring and Irrigation System" in International Journal of Engineering Research & Technology (IJERT) ISSN: 2278-0181 Published by, www.ijert.org NCETESFT - 2020 Conference Proceedings.

[4]. Dr. V. Suma, "Internet of Things (IoT) based Smart Agriculture in India: An Overview", Journal of ISMAC (2021) Vol.03/ No.01.

[5]. Durgesh Raghuvanshi, "IoT Based Smart Agriculture System" https://www.researchgate.net/publication/352399626 in research gate, January 2021.

[6]. Baldev Kaur, Manthan Chaudhary, Vipul Singh, Ayush Kumar, discussions, states, and author profiles for this publication at: https://www.researchgate.net/publication/364313182, October 2022

[7]. G. Nisha, J Megala, "Wireless Sensor Network Based Automated Irrigation and Crop Field Monitoring System", 2014 Sixth International Conference on Advanced Computing.

[8]. Fernando P. Carvalho, "Pesticides, environment, and food safety", Food and Energy Security, June 2017; 6 (2)