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Smart Agriculture Using Iot

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ABSTRACT:This paper explores the utilization of Internet of Things (IoT) technologies for sustainable crop management in smart agriculture. By integrating IoT devices such as sensors, actuators, and data analytics platforms, farmers can gather real-time data on various environmental parameters, soil conditions, and crop health indicators. This data-driven approach enables precise monitoring and management of agricultural activities, leading to improved resource efficiency, optimized crop yields, and minimized environmental impact. The proposed solution leverages the OwnCloud platform to securely store and manage agricultural data, providing farmers with convenient access to critical information for informed decision-making.

KEYWORDS: Smart Agriculture, Internet of Things (IoT), Sustainable Crop Management, OwnCloud, Sensors, Data

I. INTRODUCTION

[1]Smart agriculture, enabled by the Internet of Things (IoT), represents a paradigm shift in modern farming practices. By integrating advanced technologies such as sensors, actuators, and data analytics, smart agriculture aims to optimize crop production while minimizing resource inputs and environmental impact. One of the key challenges in traditional agriculture is the lack of real-time data on various factors influencing crop growth, such as soil moisture levels, temperature fluctuations, and pest infestations. IoT-enabled solutions address this challenge by providing farmers with actionable insights based on continuous monitoring of agricultural parameters.

II. PROBLEM DEFINITION

Traditional crop management practices often rely on manual observation and labour-intensive tasks, leading to inefficiencies and suboptimal outcomes. Farmers face challenges such as water scarcity, soil degradation, and climate variability, which impact crop productivity and sustainability. There is a need for innovative solutions that leverage IoT technologies to enable precision agriculture, enabling farmers to make data-driven decisions for sustainable crop management.

III. EXISTING SYSTEM

Existing IoT solutions in agriculture often focus on specific applications such as precision irrigation, crop monitoring, and livestock management. These solutions typically involve the deployment of sensors and actuators in the field to collect data on environmental conditions and crop health. However, many of these systems lack integration with comprehensive data management platforms, limiting their scalability and usability. Additionally, data security and privacy concerns pose challenges in adopting IoT technologies for agriculture

The security of our data and the amount of storage we require to keep and manage our data are of the utmost importance in this dynamic environment and age of ever-evolving technologies. The aforementioned issues are the main emphasis of this study. Since other users can access third-party cloud services, privacy is a concern. These cloud service companies also have some control over our data and only offer a small quantity of storage. Additionally, using these cloud services costs us a pretty penny. Using a Raspberry Pi, we can use our external hard drive as personal cloud

IV. PROPOSED SYSTEM

The proposed system integrates IoT devices with the OwnCloud platform to enable sustainable crop management in smart agriculture. IoT sensors deployed in the field collect data on various parameters such as soil moisture, temperature, humidity, and crop health indicators. This data is transmitted to a central data analytics platform, where it is processed and analysed to generate actionable insights for farmers. The OwnCloud platform is used to securely store and manage agricultural data, providing farmers with

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convenient access to real-time information for decision-making.

V. REQUIREMENTS SPECIFICATIONS

A. Software Requirements:

1) OwnCloud: A secure and scalable file hosting platform for managing agricultural data.
2) Data Analytics Software: Tools for processing and analysing agricultural data collected from IoT sensors.
3) IoT Platform: Software framework for managing IoT devices and data streams.

B. Hardware Requirements:

1) IoT Sensors: Devices for measuring environmental parameters such as soil moisture, temperature, and humidity.
2) Actuators: Devices for controlling irrigation systems, fertilization, and pest management.
3) Data Logging Devices: Hardware for collecting and transmitting data from IoT sensors to the central data analytics platform.

VI. DESIGN AND METHODOLOGY

A. General Architecture:

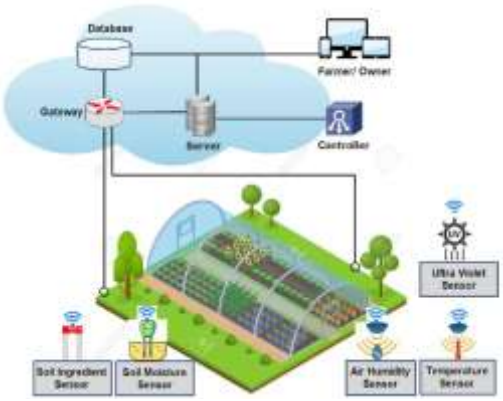

Figure1: Theabovefigureisthesystem architecture of Smart agriculture harvesting using IoT

B. Working of OwnCloud Application:

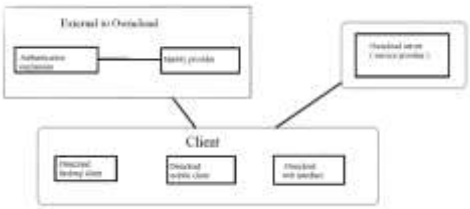

Figure2: Theabovefigureshowsthe working of the owncloud application.

Initially, the requests are processed by the Authentication mechanism and then the requests are forwarded to the client application and then forwarded to the server then the request is processed in the server, and the response is sent back to the client.

VII. RESULTS

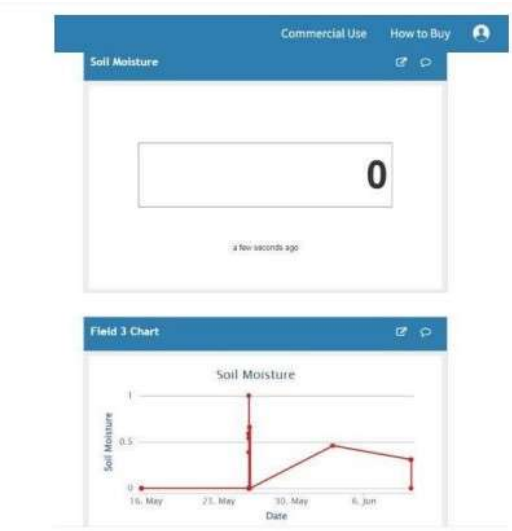

Figure 3 : Moisture content of the field along with the graph

These reading shown on Laptop. But We Can Monitor easily these parameters on Cell Phone. All internet GPRS supported cell phones can show these graphical readings

Figure 5: Record of temperature and humidity

VIII. CONCLUSION

In conclusion, the integration of IoT technologies with the OwnCloud platform offers a promising approach for sustainable crop management in smart agriculture. By harnessing the power of IoT for real-time monitoring and data analysis, farmers can optimize resource allocation, improve crop yields, and reduce environmental impact. Further research and development are needed to enhance the scalability, interoperability, and security of IoT-enabled solutions in agriculture.

IX. FUTURE SCOPE

The Future work will focus on expanding the capabilities of the proposed system to address additional challenges in smart agriculture, such as pest management, crop disease detection, and supply chain optimization. Integration with emerging technologies such as block chain and artificial intelligence will also be explored to further enhance the efficiency and resilience of agricultural systems.

REFERENCES

[1]. Tragos, E. Z., Angelakis, V., Fragkiadakis, A., Gundlegard, D., Nechifor, C. S., Oikonomou, G & Gavras, A. (2014, March). Enabling reliable and secure IoT-based smart city applications. In 2014 IEEE International Conference on Pervasive Computing and Communication Workshops (PERCOM WORKSHOPS) (pp. 111-116). IEEE.

[2]. Shah, J., & Mishra, B. (2016, January). IoT enabled environmental monitoring system for smart cities. In 2016 International Conference on Internet of Things and Applications (IOTA) (pp. 383-388). IEEE.

[3]. Pasha, S. (2016). ThingSpeak based sensing and monitoring system for IoT with Matlab Analysis. International Journal of New Technology and Research, 2(6).

[4]. Khan, R., Khan, S. U., Zaheer, R., & Khan, S. (2012, December). Future internet: the internet of things architecture, possible applications and key challenges. In 2012 10th international conference on frontiers of information technology (pp. 257-260). IEEE.

[5]. https://components101.com/development-boards/nodemcu-esp8266-pinout-features-and-datasheet

[6]. Kumar, N. S., Vuayalakshmi, B., Prarthana, R. J., & Shankar, A. (2016, November). IOT based smart garbage alert system using Arduino UNO. In 2016 IEEE Region 10 Conference (TENCON) (pp. 1028-1034). IEEE.

[7]. Kumar, S., & Jasuja, A. (2017, May). Air quality monitoring system based on IoT using Raspberry Pi. In 2017 International Conference on Computing, Communication and Automation (ICCCA) (pp. 1341-1346). IEEE.

[8]. Talari, S., Shafie-Khah, M., Siano, P., Loia, V., Tommasetti, A., & Catalao, J. (2017). A review of smart cities based on the internet of ˜ things concept. Energies, 10(4), 421.25

[9]. Ma, Y., Yang, S., Huang, Z., Hou, Y., Cui, L., & Yang, D. (2014, December). Hierarchical air quality monitoring system design. In 2014 International Symposium on Integrated Circuits (ISIC) (pp. 284-287).IEEE.

[10]. Ahlgren, B., Hidell, M., & Ngai, E. C. H. (2016). Internet of things for smart cities: Interoperability and open data. IEEE Internet Computing, 20(6), 52-56.

[11]. https://creativestudio1973.blogspot.com/2019/11/temperature-andhumidity-sensor.html

[12]. https://www.instructables.com/Measuring-Humidity-Using-SensorDHT22

[13]. https://www.naukri.com/learning/articles/iot-in-agriculture-howconnected-devices-are-shaping-the-future-of-farming/

[14]. https://www.xenonstack.com/use-cases/iot-smart-farming

[15]. https://creativestudio1973.blogspot.com/2021/05/nokia-5110-lcddisplay-interface-with.html