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Managing and Reporting System for Weather Parameters Using IOT

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ABSTRACT: The development of a weather parameter monitoring and reporting system employing IoT technology, centered around a Raspberry Pi 4 (RPI 4) as a central hub for data gathering and processing, revolutionizes weather management by addressing the inadequacies of conventional systems. IoT devices that have been strategically positioned and are outfitted with sensors and communication modules capture real-time meteorological data, including temperatures, humidity levels, air pressure, wind speed, and precipitation. With this wide-ranging coverage, the transfer of accurate and timely information to the central RPI 4 is ensured, allowing individuals, groups, and governments to plan appropriately and make choices based on the weather at the time. By enhancing daily operations with innovative technologies, numerous sectors may best allocate resources while also increasing productivity and safety.

KEYWORDS: RPI 4, IoT.

I. INTRODUCTION

Weather conditions have a big impact on a lot of aspects of our lives, including agriculture, transportation, energy management, and disaster preparedness. accurate and reliable weather information is essential for efficient decision-making and resource allocation in these areas. however, coverage, data delivery, and the availability of real-time information are typically problems with conventional weather monitoring systems. the internet of things (iot) technology has recently made it possible to construct sophisticated controlling and reporting systems for meteorological parameters.

IoT gadgets and weather monitoring systems working together can change how we perceive and react to weather situations. These systems make use of the capabilities of Internet of Things (IoT) devices with sensors to collect data in real-time on a variety of meteorological fac-tors, including temperature, humidity, air pressure, wind speed, rainfall, and sun radiation. This vast amount of data, along with highly sophisticated analytics and reporting capabilities, may help stakeholders make wiser decisions.

One of the key advantages of IoT for weather monitoring is the scalability and flexibility it offers. IoT devices can be set up in a number of locales, including harsh or remote areas, to gather data from different geographical regions. This comprehensive coverage ensures a deeper understanding of weather trends, enabling more accurate forecasting and improved risk management in relation to the weather.

Aside from that, the real-time nature of IoT-enabled weather monitoring devices guarantees that the information is current and readily available to people, businesses, and governmental organizations. Stakeholders can adjust and make advance plans for shifting weather patterns with precise weather data at their disposal, minimizing the effects of poor weather and maximizing resource allocation.

II. LITERATURE SURVEY

The document [1] Sensors are used in the IoT-based weather monitoring system to collect weather data, and a cloud-based platform is used to analyse that data. The system intends to deliver real-time weather data for a range of applications.

The authors of the paper [2] discuss the creation of an Internet of Things (IoT)-based weather monitoring system that collects data from multiple weather sensors and wirelessly transmits it to a remote server. The system enables real-time weather monitoring and analysis.

The paper's authors [3] propose an Internet of Things (IoT)-based weather monitoring and alerting system that makes use of a range of sensors to measure weather parameters and alerts users when predetermined thresholds are reached, The programme aims to enhance weather predictions and deliver quick notifications.

According to the cited research [4], this paper presents an Internet of Things-based weather monitoring system designed exclusively for precision agriculture. The system employs sensors to collect weather data and provides farmers with knowledge to aid in improved crop management, irrigation, and pest control decisions.

This research [5] proposes a machine learning-based Internet of Things-based weather monitoring system. The technology combines weather data from numerous sources with machine learning algorithms to improve weather forecast accuracy.

According to the authors of [6], this work presents an Internet of Things-based weather monitoring system designed exclusively for smart agriculture. The technology analyses meteorological data using machine learning techniques and provides useful information for efficient farming practises.

III. PROPOSED WORK

Traditional weather monitoring systems have a variety of drawbacks, including a lack of real-time information, delayed data, and a limited coverage area. These inadequacies make it difficult to manage the weather effectively and make decisions related to transportation, agriculture, and disaster planning, to name a few. To solve these problems, an Internet of Things (IoT)-based managing and reporting system for meteorological parameters is needed.

Effective weather management and decision-making are hampered by the present weather monitoring systems' lack of real-time data, coverage, and accessibility. It is necessary to develop a comprehensive managing and reporting system for weather parameters utilizing IoT in order to overcome these limitations and provide reliable, timely, and accessible weather information. This system should contain Internet of Things (IoT) sensors, provide a reliable data gathering and transmission mechanism, incorporate data processing, and offer stakeholders a user-friendly interface for gaining access to real-time weather data and disseminating alerts. Based on accurate and recent meteorological data, the suggested system seeks to enable proactive planning, risk mitigation, and optimized resource allocation.

IV. IMPLEMENTATION

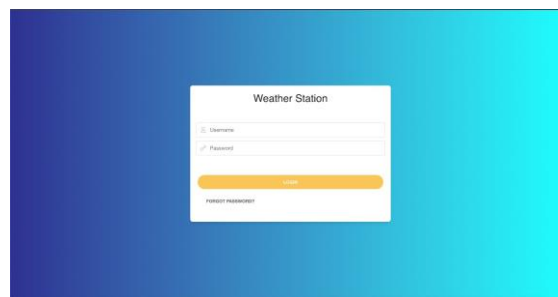


Fig 1. Login Page for Managing and Reporting System for Weather Parameters using IoT

The Fig 1 shows the login page where the user or admin can login with their credentials.

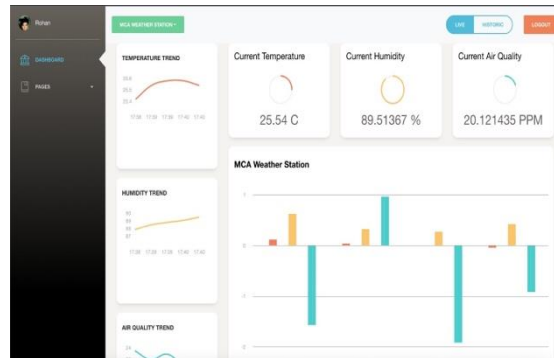


Fig 2. Dashboard of the application

The Figure 2: The Dashboard where the user or the admin can see the live data from the sensors according to the weather station

VI. CONCLUSION

The project "Managing and Reporting System for Weather Parameters Using IoT" aims to gather and monitor weather data from numerous sensors placed in various locations. For controlling the sensors, creating reports, and examining weather patterns, the system offers an intuitive user interface.

Overall, a comprehensive solution for monitoring and analyzing weather data is what the managing and reporting system for weather parameters utilizing IoT seeks to offer. To ensure effective and safe operations, it provides tools for user management, sensor integration, data retrieval, reporting, and password management. The system helps users plan ahead and adjust to shifting weather conditions, enabling better decision-making based on precise weather information.

VII. FUTURE SCOPE

Expanding the System's Sensor Capacity: The system might be enhanced to support the addition of new sensor types, such as wind-speed, UV-index, or solar radiation sensors. This would provide a more complete understanding of the weather.

Integration of geolocation: it will help the system to automatically locate the user and display localised weather information. Users can also look up weather data for specific regions or fascinating locations.

Mobile Application: If a specialised mobile application were created, users could access the system and monitor weather parameters while on the go. The mobile app may include push notifications, real-time data visualisation, and user-friendly interfaces made for smaller screens.

Enhancements to Data Visualisation: By enhancing the system's data visualisation capabilities, users would be better able to interpret weather data. Interactive charts, graphs, and maps could be used to show weather patterns and trends in a way that is both aesthetically pleasing and understandable.

REFERENCES

- [1] H. Jaiswal, P. Chauhan, K. Mehta, "IoT-Based Weather Monitoring System", 2016 6th International Conference - Cloud System and Big Data Engineering.
- [2] K. Kottapalli, R. Satya Prasad, "Design and Development of an IoT-Based Weather Monitoring System", 2017 International Conference on Electrical, Electronics, Communication, Computer, and Optimization Techniques.



- [3] A. Kaur, K. Kaur, H. Kaur, “IoT-Based Weather Monitoring and Alerting System”, 2018 3rd International Conference on Internet of Things: Smart Innovation and Usages.
- [4] M. A. Hossain, S. A. Rashid, M. H. Islam, S. M. A. Islam, “An IoT-Based Weather Monitoring System for Precision Agriculture”, 2019 7th International Conference on Advances in Computing, Communication, and Networking.
- [5] S. Y. Kim, H. Kim, D. J. Shin, J. S. Park, S. Y. Yoon, “IoT-Based Weather Monitoring System Using Machine Learning Techniques”, 2020 9th International Conference on Informatics, Environment, Energy, and Applications.
- [6] S. R. Prabakaran, S. Chandrasekaran, M. Karthikeyan, N. Naveen, “IoT-Based Weather Monitoring System with Machine Learning for Smart Agriculture”, 2021 International Conference on Smart Systems and Inventive Technology.
- [7] J. S. Kim, H. Y. Lee, S. W. Lee, Y. J. Park, “Design and Implementation of an IoT-Based Weather Monitoring System for Disaster Management”, 2022 IEEE International Conference on Sustainable Energy, Electronics, and computing Systems.
- [8] T. C. Wong, W. S. Teng, W. K. Wong, Y. M. Lee, “An IoT-Based Weather Monitoring System for Renewable Energy Planning”, 2021 International Conference on Smart Systems and Inventive Technology.
- [9] S. Gupta, P. S. Rana, M. K. Pradhan, A. Sharma, “IoT-Based Weather Monitoring and Forecasting System Using Edge Computing”, 2023 International Conference on Internet of Things and Intelligence Systems.
- [10] H. Park, H. J. Kang, S. Y. Kim, J. S. Lee, S. H. Hong, “A Distributed IoT-Based Weather Monitoring System for Urban Environments”, 2023 International Conference on Artificial Intelligence and Robotic.



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