INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 8.379

Automatic Weather Monitoring System using IOT

Shreya Bhosale[1], Diya Patil[1], Sanika Burud[1], Sahil Bhalekar[1], Raisa M. Mulla[2]

Diploma Student, Dept. E & TC, Sanjay Ghodawat Polytechnic, Atigre, Kolhapur, India[1]

Lecturer, Dept. E & TC, Sanjay Ghodawat Polytechnic, Atigre, Kolhapur, India[2]

ABSTRACT—A weather station is an apparatus or gadget that informs us of the weather conditions in our immediate surroundings. It could provide us specifics like the temperature, barometric pressure, humidity, etc. in the area. As a result, this instrument primarily measures temperature, pressure, humidity, light intensity, and rain value. The prototype has several types of transducers that may be used to measure all the characteristics listed above. It may be used to monitor the humidity or temperature of an area. Temperature and humidity may be used to compute the dew point and other data elements.In addition to the features already described, we can also keep an eye on the area's lighting levels. Additionally, We've also made it possible to monitor the air pressure in the space.The worth of the rain may also be tracked. The prototype's brain is a Wi-fi module built on the ESP8266 called Node MCU (12E). A light dependent resistor (LDR), a pressure sensor (BMP180), a temperature and humidity sensor (DHT11), and a raindrop module are the four sensors included with the Node MCU. An email, a tweet, and an SMS are sent whenever these values go beyond a specified threshold limit for each, notifying the appliance's owner to take the appropriate action.

I. INTRODUCTION

Here, we offer a sophisticated online weather reporting system. Our newly developed technology enables online reporting of meteorological parameters. It enables users to check the weather conditions online without a weather forecasting organisation. The system measures temperature, humidity, and rain using a humidity sensor, and it also give real-time weather statistics reporting. The system continuously checks the temperature, humidity, and rain using a rain sensor and a temperature sensor. Detecting and collecting numerous weather characteristics at multiple places so they may be analysed or utilised for weather forecasting is the focus of a weather monitoring system. Internet of Things (IOT) and cloud technologies help this system achieve its goal. The aim behind the internet of things is to link various connected gadgets as well as a device to the internet. Information from the IOT device may be sent to the cloud and ultimately to the end user with ease via the Internet.

An crucial practical use of the Internet of Things is weather monitoring, which entails detecting and collecting numerous weather characteristics and utilising them for warnings, notifications, and other purposes. The data that is collected is sent to the cloud so that it may be further presented. In addition, the system is made up of parts like the Arduino MEGA board, a microcontroller board with 53 digital pins, a USB connection, and everything else needed to support microcontrollers; the DHT22 temperature and humidity sensor, used to measure the aforementioned parameters; and the WIFI module, which is used to convert the data gathered from the sensors and send it to the web server. So, in this manner, any remote location's meteorological conditions may be observedlocationintheworld

II. LITERATURE SURVEY

➢ This project showcases a weather monitoring system design. It keeps information gathered at predetermined sample intervals, dates and timestamped for later retrieval, and real-time notifications for monitoring and analysing various environmental characteristics, including

➢ the location's coordinates, temperature, humidity, atmospheric pressure, wind speed, wind direction, air quality, light intensity, and amount of precipitation. It is made up of an Arduino MEGA (microprocessor), which serves as a gateway for data and information collection using various probes. By M. RahamanLaskar, R. Bhattacharjee, M. SauGiri, and P. Bhattacharya, "Weather Forecasting Using Arduino Based Cube-Sat"

➤   They created a self-contained, tiny cube satellite that offers meteorological data devoid of the need for an internet connection. Without strong transceivers, this device may not be able to communicate over long distances, and using a gas balloon to capture data at greater altitudes may provide challenges. The components are not waterproof, thus even after prolonged usage they might become damaged. Jitendra Singh, Rehan Mohammed, MradulKankaria, RoshanPanchal, Sachin Singh, and Rahul Sharma's Arduino-Based Weather Monitoring System

III. BLOCKDIAGRAM
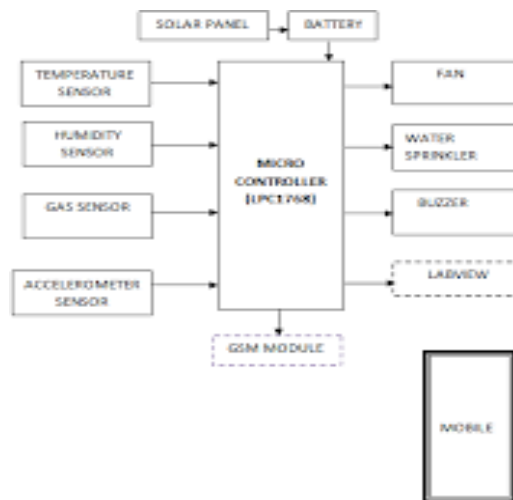
We will construct the weather monitoring system using the depicted components from above. An Arduino board serves as the project's central processing unit, and digital and analogue sensors are used as building blocks to collect data on the local climate and surroundings.

For connecting the circuit configuration to the internet through the 2.4 GHz Wi-Fi band, a generic ESP8266 is utilised. The ESP8266 transmits the sensor data to a cloud server, where it is updated in real-time and saved for further study. We are utilizing a24x2LCDdisplaytoshowcasethesensordata,sothatwecanobserverereal-timedatalocally.

V. METHODOLOGY

The Internet of Things (IoT) is a sophisticated automation and analytics system that uses big data, artificial intelligence, networking, sensing, and sensing technologies to give comprehensive systems for a good or service. Any industry or system may use these solutions to achieve improved transparency, control, and performance. IOT systems have uses in a variety of sectors because to their exceptional flexibility and capacity to be adaptable in any setting. With the help of intelligent devices and potent supporting technologies, they improve data collecting, automation, operations, and much more. Common Uses of the Internet of Things All sectors of the economy and markets may use IoT. It has a wide range of users, from individuals who wish to consume less energy at home to huge corporations that want to optimise their operations. In many sectors, it turns out to be not just helpful but also almost essential as technology develops and we approach closer to the sophisticated automation that is envisioned for the far future.

VI. HARDWARESPECIFICATIONS

1.   Solarpanel
2.   Rechargeablebattery
3.   Dcmotor30Rpm
4.   AurdinoMega
5.   DHT22sensor
6.   BMP180sensor

7. Windsensor
8. BH1750sensor

VII. ADVANTAGES

- Real-TimeData
- Real-TimeAlert
- AccurateLocalForecast
- HelpsYouMaintainYourHomeBattery

VII. LIMITATIONS OF THE SYSTEM

- Forecasting Is Expensive
- Not entirely reliable
- Requires expertise to analyses
- Reliesonintensedatasets
- Theanalysis isnotinstant
- Weather changes all thsetime

XI. FUTURE DEVELOPMENT

1. Greater accuracy: The accuracy of weather forecasts will continue to increase thanks to developments in sensor technology and data analytics, making them more dependable and beneficial for a variety of businesses.

2. Greater effectiveness: Cost-saving automatic weather monitoring systems reducing the effort and time needed to gather and analyse meteorological data and enabling more effective resource allocation and decision-making.

3. Greater safety: By giving early warnings of catastrophic weather disasters like hurricanes, tornadoes, and floods, real-time weather monitoring can help safeguard people's lives and property.

X. APPLICATIONS

1. Solarpowerplantandsolarproject
2. Wind Plant
3. Aviationandmeteorologicaloperations
4. Environmentaleducation
5. Weatherinformationservice

XI. CONCLUSION

Our weather station is now operational, at last. A stand supports the enclosure, which houses the wireless weather sensor. Temperature, humidity, wind pressure, wind speed, altitude, a rain gauge, and light intensity are all being recorded. The battery is still at 100% even though it has been in the same place for a little more than a week. There were a few days with rain and a few days when the temperature hit 90 °F. Due to the comprehensive testing I performed in Blog 4 of this series, everything functioned as intended. The largest challenges was connecting the Gateway to the internet, the SP-005, and the TC sensors to the Smart Sensor.AfterI figured these things out I was ableto use the System as intended in my Idea andDesign.

REFERENCES

Paper-

1. S. Anand, S. Saini, and S. Kumar,"IoTbasedautomaticweathermonitoring and prediction system,"in2019InternationalConferenceonElectrical,Electronics,Communication,Computer,andOptimization Techniques(ICEECCOT),2019, pp.1-6.
2. N. Ahmed, S. Ahmed, and M. A.Khan, "Design and development ofautomaticweathermonitoringsystemusingIoT,"in20207thInternationalConferenceonElectricalandElectronics Engineering (ICEEE), 2020, pp. 1-6.
3. M.R.Alam,M.F.S.Hussain,and
4. M.M.Islam,"DevelopmentofautomaticweathermonitoringsystemusingIoT,"in2020InternationalConferenceonC omputer, Communication,Chemical, Materials and ElectronicEngineering(IC4ME2),2020,pp.1-
5. Banerjee and S. Sarkar, "An IoT-basedautomaticweathermonitoring and forecasting systemforprecisionagriculture,"JournalofAmbientIntelligenceandHumanizedComputing,vol.12,no. 9, pp. 8695-8707, 2021.

Websites:-
6. https://electronics-project-hub.com/iot-based-weather-monitoring-system-using-arduino/
7. https://www.researchgate.net/publication/353773459_Real_Time_Weather_Monitoring_System_Using_Iot
8. https://www.ijert.org/internet-of-things-iot-based-weather-monitoring-system
9. https://www.itm

INNO SPACE
SJIF Scientific Journal Impact Factor
Impact Factor: 8.379

doi crossref

ISSN
INTERNATIONAL STANDARD SERIAL NUMBER
INDIA

निस्केयर
NISCAIR

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

📱 9940 572 462　🟢 6381 907 438　✉ ijircce@gmail.com

Scan to save the contact details