

## WEATHER MONITORING SYSTEM USING IOT

**Prof. Bhushan Mankar\*<sup>1</sup>, Mr. Akshay Thakare\*<sup>2</sup>, Mr. Hrutwik Dalvi\*<sup>3</sup>,  
Mr. Rushikesh Kale\*<sup>4</sup>, Mr. Nikhil Deshmukh\*<sup>5</sup>, Mr. Suraj Mahalle\*<sup>6</sup>**

\*<sup>1</sup>Professor, Department Of Electronic And Telecommunication Engineering, P. R. Pote (Patil) College Of Engineering And Management, Amravati, Maharashtra, India.

\*<sup>2,3,4,5,6</sup>Degree Student, Department Of Electronic And Telecommunication Engineering, P. R. Pote (Patil) College Of Engineering And Management, Amravati, Maharashtra, India.

---

### ABSTRACT

In this research, a foundation is set for an efficient solution for tracking the weather conditions of a specific location and making the information available anywhere in the world. The technological advances behind this is often Internet of Things (IOT), which is an efficient and effective solution for linking the items to the online and to attach the whole world of things in a network. Here things might be like an electronic gadgets, sensors, and automotive electronic devices. The system functions with tracking and monitoring environmental circumstances like temperature, ratio, candlepower, pressure and quantity of rainfall with sensors and whenever these scores exceed a selected threshold limit for each an e-mails, an SMS alerts appliance owner to need the required steps.

**Keywords:** Cloud, Internet Of Things, Weather Monitoring System, Smart Environment.

---

### I. INTRODUCTION

Weather monitoring system deals with detecting and gathering various weather parameters at different locations which may be analyzed or used for meteorology. The aim of this technique is achieved by technologies like Internet of Things (IOT) and Cloud. The thought of internet of things is to attach a tool to web and to other required connected devices. Using Internet the knowledge from the IOT device can easily be transferred to the cloud then from the cloud to the top user. Weather Monitoring is an important practical implementation of the concept of Internet of Things, it involves sensing and recording various weather parameters and using them for alerts, sending notifications, adjusting appliances accordingly and also for future analysis. Also we'll attempt to identify and display trends in parameters using graphical representation.

The devices used for this purpose are wont to collect, organize and display information. It's expected that the web of things goes to rework the planet by monitoring and controlling the phenomenon of environment by using sensors/devices which are ready to capture, process and transmit weather parameters. Cloud is availability of computing system resources like data storage, computing power without direct actives management of user. The info captured is transmitted to the cloud in order that the info might be further displayed. Besides this, the system consists of components like Arduino UNO board which may be a microcontroller board consisting of 14 digital pins, a USB connection and everything wont to support microcontroller; DHT11 is temperature and humidity sensor which is employed for detecting these mentioned parameters; WIFI module is employed to convert the info collected from the sensor then send it to the online server.

So, during this way weather of any location are often monitored from any remote location within the world. An internet page is made which may have access to the cloud and display and organize the specified results.

### II. METHODOLOGY

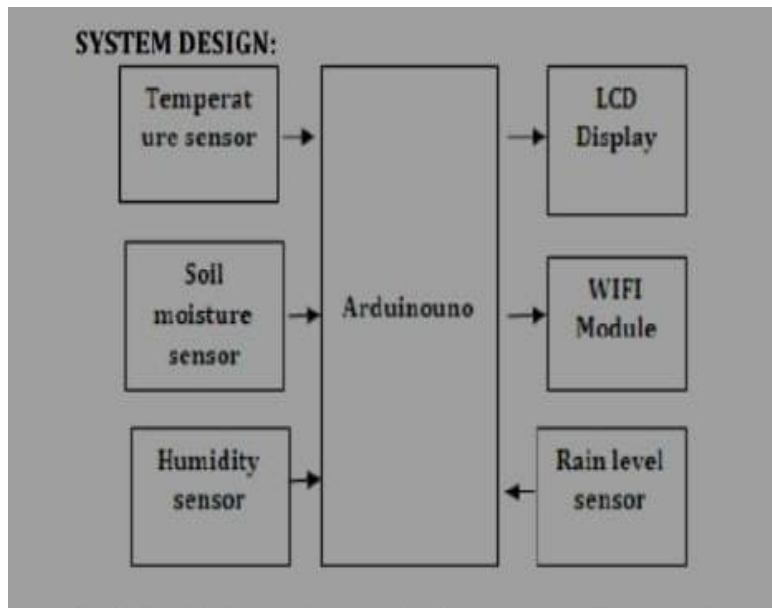
The purpose of the weather monitoring system is to gather data on environmental conditions like temperature, pressure, humidity and light weight in a neighborhood using multiple end nodes. The top nodes send the info to the cloud where the info is aggregated and analyzed.

### III. WORKING

Working of this Project is based on the following components used in this project.

**System Design**

In IOT enabled weather monitoring system project, Arduino Uno measures four weather parameters using four respective sensors. These sensors are temperature sensor, humidity sensor, moisture sensor and rain level sensor. These four sensors are directly connected to Arduino Uno. Arduino Uno has inbuilt Analog to digital converter. Arduino calculates and displays these weather parameters on LCD display. Then it sends these parameters to Internet using IOT techniques.

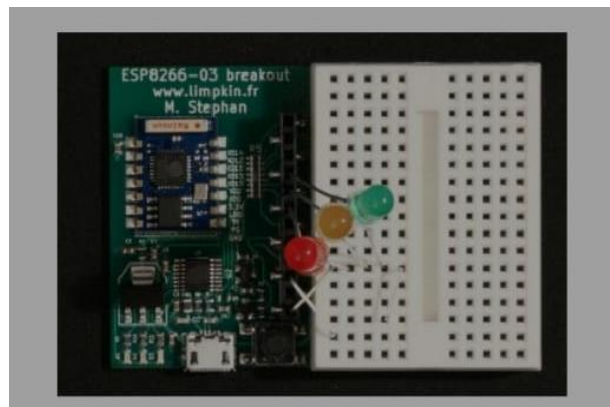


**Figure 1:** System Design.

**MICROCONTROLLER/ARDUINO UNO:-**

The implemented system consists of a microcontroller (ESP8266) which is that the most essential component during this device. The sensors are often operated by the microcontroller to urge the info from them and it processes the analysis with sensor data from them and it processes the analysis with the sensor data and updates it into the web through WIFI module.

Arduino/Genuino Uno may be a microcontroller board supported the ATMEGA328P. Its 14 digital input/output pins, 6 analog inputs, 16 MHz quartz, a USB connection, an influence jack, an ICSP header and a push button. It contains everything needed to support the microcontroller, simply connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to urge started.



**Figure 2:** - Simple Arduino Microcontroller Board

**WIFI MODULE:-**

The Arduino Uno which we have used is integrated with a Wi-Fi module called Arduino Uno Wi-Fi. The board is based on the ATmega328P with an ESP8266 Wi-Fi module consolidated TCP/IP protocol stack. In order to establish communication with the ESP8266 Wi-Fi module, microcontroller needs to use some AT commands.



**Figure 3:-** Wifi Module

**SENSORS:-**

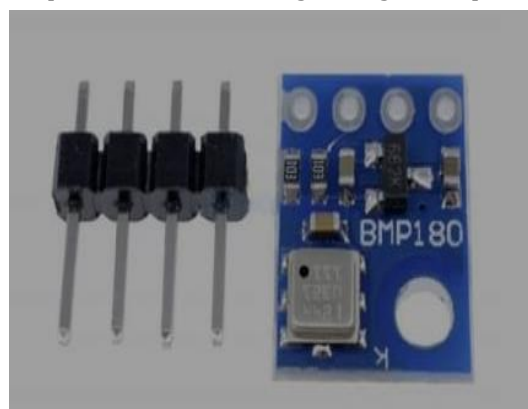
The system consists of a temperature and humidity sensor (DHT 11) and Barometric Pressure Sensor (BMP180). These 2 sensors will be measure the primary environmental parameters like temperature, humidity and the CO levels. These sensors will give the analog voltage as an input to the microcontroller board as each analog voltage corresponds to a particular weather factor, then the microcontroller will convert.



**Figure 4:-** SENSOR (DHT-11)

**BAROMETRIC PRESSURE SENSOR (BMP180):-**

BMP 180 may be a part of BMPXXX family which are used for measuring atmospheric or atmospheric pressure. It's cheap and convenient to use. It measures the atmospheric pressure which is nothing but air weight or weight of the air in simple words. It provides the knowledge in digital output.



**Figure 5:-** BMP-180

**LDR (Light-Dependent Resistor):-**

An LDR may be a light dependent resistor which work on the principle that it's a rheostat in it .which changes its resistance consistent with the intensity of the sunshine. it's widely utilized in many light sensing or light detecting circuit for instance in some smartphone it's attached with camera in order that the camera can adjust its shutter speed consistent with the intensity of the sunshine . Its resistance decrease with the rise in candlepower. It's built of a high resistance semiconductor.

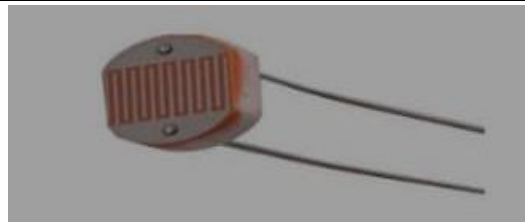


Figure 6:- LDR

**Raindrop Module:-**

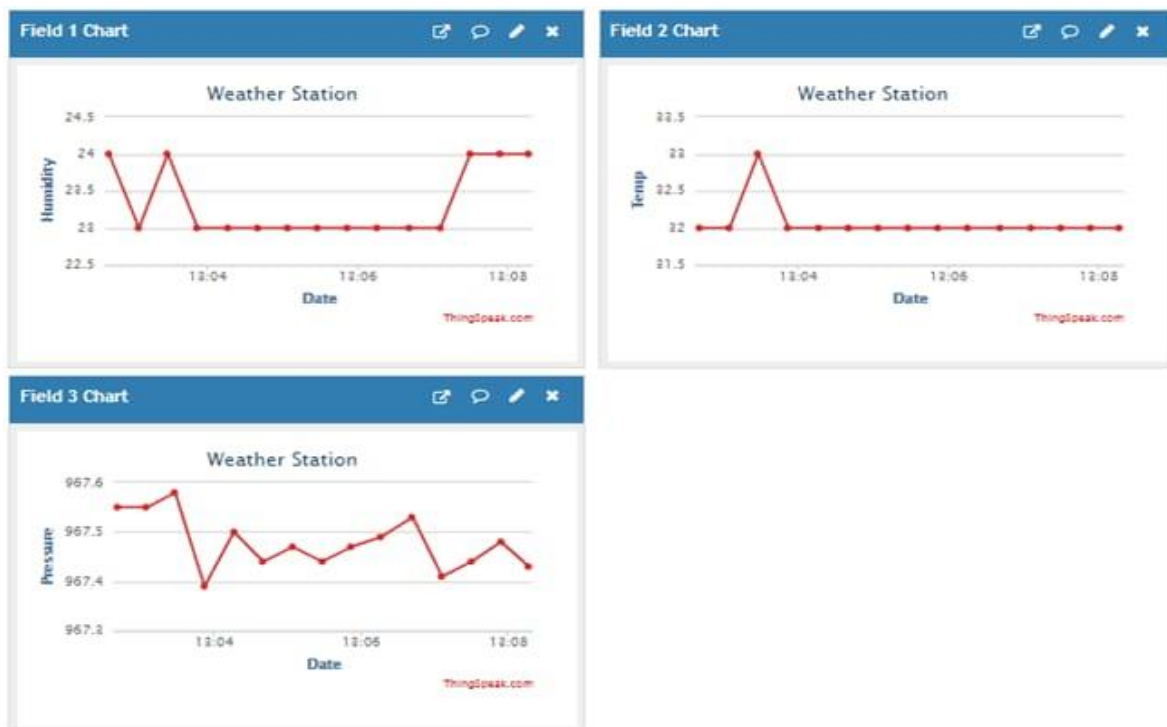
It is used for the detection of rain. It can also be used to detect the intensity of rainfall. It has both digital outputs as well as analog output. It has two further sub components that are control board and rain board. It has a potentiometer for adjusting the sensitivity.



Figure 7:- Raindrop Module Sensor

**IV. RESULTS AND DISCUSSION**

Once the sensor measures are downloaded to the cloud, the values are evaluated then the edge limit exceed an e-mails, an SMS and a tweeter post are posted.



**V. CONCLUSION**

This System monitor the changes happening over the environment and provide enough ways for the users to access the knowledge from anywhere through cloud. The temperature and humidity sensor will monitor and provides the small print about the changes happening over the climate. The gas and sound sensor are used for monitoring the pollution over environment. The Monitored condition are going to be updated within the cloud.

## VI. FUTURE SCOPE

1. One can implement a couple of more sensors and connect it to the satellite as a worldwide feature of this technique.
2. In aircraft, navigation and military there's an excellent scope of this real-time system.
3. It can also be implemented in hospitals or medical institutes for the research & study in "Effect of Weather on Health and Diseases", hence to provide better precaution alerts.

## ACKNOWLEDGEMENTS

First of all, we extend our deepest gratitude guide **Prof. Bhushan Mankar** for providing immense support and guidance. We are beholden for guiding us at every step in the project. He has most honestly guided us throughout; never leaving us unanswered for any of our doubts. It was him constant persuasion, encouragement, inspiration and able guidance that helped us in completing our Project successfully.

## VII. REFERENCES

- [1] Rao BS, Rao KS, Ome N (2016) Internet of Things (IOT) based weather monitoring system. International Journal of Advanced Research in Computer and Communication Engineering Sep 5(9): 312-319.
- [2] Gangopadhyay S, Mondal MK (2016) A wireless framework for environmental monitoring and instant response alert. In International Conference on Microelectronics, Computing and Communications (MicroCom) Jan 23 HE. p. 1-6
- [3] Kumar D, Aseri TC, Patel RB (2010) EECHDA: Energy Efficient Clustering Hierarchy and Data Accumulation for Sensor Networks. BIJIT 2(1): 150-157.
- [4] Cerpa A, Estrin D (2004) ASCENT: Adaptive self-configuring sensor networks topologies. IEEE transactions on mobile computing 3(3): 272-285.