IOT Based Weather MoniteringSystem

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Abstract-The Internet of Things (IoT) is a latest concept of relating physical computing devices or other objects to internet and can communicate with each other. Each object is provided with unique identifiers and the ability to transfer data over internet network without h um an intervention and machine interaction. The project targets on a simple microcontroller, Node MCU with connection to the wireless weather monitoring system, WiFi ESP8266 which monitors weather condition using threesensors such as temperature, rain and soil moisture sensor. It then displays all data in the Blynk App The project have been developed by using Node mcu microcontroller, wifi ESP8266,DHT11 temperature and humidity sensor, rain sensor and soil moisture sensor. It is suitable for monitoring weather in any place and any time. The system deals with monitoring and controlling the environmental conditions like temperature, relative humidity, and CO level with sensors and sends the informationto the web page, and then plots the sensor data as graphical statistics. The data updated from the implemented system can be accessible in the internet from anywhere in the world.

I INTRODUCTION

Climate plays an important role in human life the unprecedented growth of industries and vehicular traffic has seriously affected the purity of clean air and environment. Satellite weather report system givescondition of present which does not give the exact condition of the particular place. The building sectoroffers a great potential for the energy savings, where it isnecessary to have accurate weather data in the exact Improve the calibration of energy simulation programs. By develop a controlling local weather reporting system with Node MCU microcontroller can minimize the error in weather forecast system at exact location. Even though water is a scarce resource, overall 50% of water is wasted in agriculture due to the improper scheduling of irrigation. In this context, the real-time monitoring of water usage in the fields can prevent misuse of water. Use of technology in the field of agriculture plays important role in increasing the production as well as in reducing the extra man power efforts, some of the researches tried for betterment of farmers and provides the systems that use technologies which are helpful for increasing the agriculture yield. Difficulty to monitor weather parameters through offline system such as agriculture zone during certain hazardous envy and critical situations where the people need to check manually the weather condition at the places and it will take time unless it is online system. In the evolving generation of wireless technology, the concept of smart cities and IOT has given a new remark in the world. Onesuch remark leads towards the online smart weather station system. The weather parameters should be able displaying, analyzing and monitoring system using Thing Speak or BLYNK App that connect user with internet that visible anywhere in the world. To analyze and monitoring system using Thing Speak or BLYNK App that connect user with internet that visible anywhere in the world. IOT is playing a leading role in providing solutions to many applications with the support of software, internet and embedded systems.

II. OBJECTIVE

The objective of a real-time weather monitoring system using IoT is to collect, analyzes, and disseminates weather data in real-time. This system aims to provide accurate and up-to-date weather information to users, enabling them to make informed decisions and take necessary precautions based on the current weather conditions. The system also helps in tracking and predicting weather patterns, providing early warning alerts for

potential natural disasters, and improving the overall efficiency and effectiveness of weather-related activities.

III. METHODOLOY

A.WORKING:

In this project, we will measure Humidity, Temperature and Pressure parameters and display themon the Blynk application, which makes it an IOT basedWeather Station where the weather conditions can bemonitored from anywhere using the Internet. The DHT11 module features a humidity and temperature complex with a calibrated digital signal output. TheDHT11 sensor module is a combined module for sensing humidity and temperature which gives acalibrated digital output signal. DHT11 gives us a veryprecise value of humidity and temperature and ensures high reliability and long term stability. This sensor measures the absolute pressure of the air around it. Thepressure value depends on both the weather and altitude.It depends on how you interpret the data, and can easily monitor changes in the weather, measure the altitude, orany other tasks that require an accurate pressure reading. DHT11 module features a humidity and temperature complex with a calibrated digital signal output means DHT11 sensor module is a combinedmodule for sensing humidity and temperature which gives a calibrated digital output signal. DHT11 gives usa very precise value of humidity and temperature and ensures high reliability and long term stability. It is abarometric pressure sensor and it works with an I2Cinterface. This sensor measures the absolute pressure of the air around it. The pressure value depends on both the weather and altitude. It depends on how you interpretthe data, and can easily monitor changes in the weather, Measure the altitude, or any other tasks that require an accurate pressure reading.

BMP 180 Pressure Sensor. It is a barometric pressure sensor and it works with an I2C interface. This sensor measures the absolute pressure of the air around it. The pressure value depends on both the weather and altitude. It depends on how you interpret the data, and can easily monitor changes in the weather, measure the altitude, or any other tasks that require an accurate pressure reading.

Rain sensors are used in the detection of water beyond what a humidity sensor can detect. The rain sensor detects water that completes the circuits on its sensor boards printed leads. The sensor board acts as a variable resistor that will change from 100k ohms when wet to 2M ohms when dry. In short, the wetter the board the more current that will be conducted. We have also connected soil moisture and Gas sensor to measure water content in soil and fire or smoke detection using Gas sensor.

B.CIRCUIT DIAGRAM

Assemble all systems as per circuit diagram. Programthe Node MCU using Arduino IDE. You will get confirmation on your screen once The Node MCU isa programmable controller which has inbuilt wi-fimodule We connect three sensors.1) BMP180 2) DHT11 3) Rain Sensor 4) Gas sensor 5) Soil Moisture sensor to Node MCU. By using these five sensors, we can collect the required weather data for monitoring purposes. This pooled data is streamed over the Internet to display it or read it from anywhere.

After the successfully programmed hardware, the data is sent to the blynk application so we can observe data from anywhere. The weather parameters that we monitor are Temperature, Pressure, Humidity and Rain, fire or smoke and soil moisture. This project is all about IOT based Live Weather Station Monitoring using NODEMCU ESP266 We will interface DHT11 Humidity and temperature sensor, BMP280 Barometric pressure, Gas sensor, Soil moisture sensor and rainfall and upload the data to a Blynk Application to the smart phone via Wi-Fi module inbuilt in Node MCU ESP8266.

An Integrated TCP/IP protocol stack is used for transmitting and receiving sensor information. Depending on the status of weather information to thewireless remote location. The NodeMCU-12E controls the entire weather Prediction system peripherals and status on a Blynk app / web page or mobile application. In this way, a secure, flexible, trust- able and economical system is developed to solve the above-mentioned weather parameters. Also, you can check whether data is through anywhere using the Internet.

C. RESULT AND MODEL

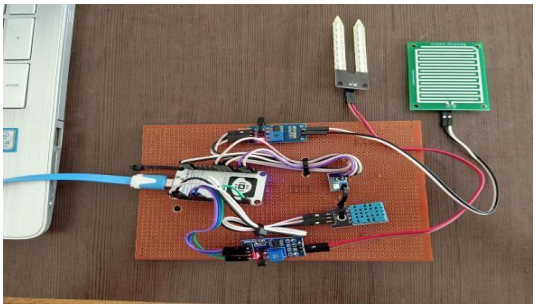
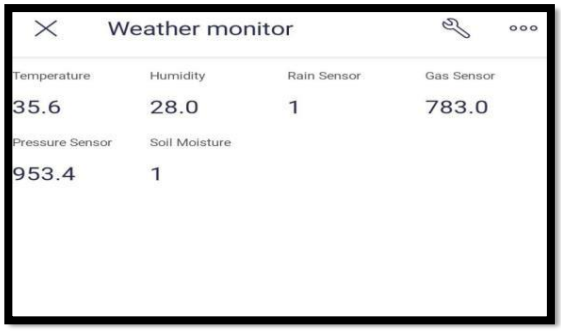


Fig. Experimental Setup of Proposed System



D. CONCLUSION

By keeping the weather station in the environment for monitoring enables self-protection (i.e., smart environment) to the environment. To implement this need to use the sensor devices in the environment for collecting the data and analysis. By using sensor devices in the environment, we can bring the environment into real life. Then the collected data and analysis result will be available to the user through the Wi-Fi. The smart way to monitor environment an efficient, It also sent the sensor parameter to the cloud. This data will be helpful for future analysis and it can be easily shared to other also. This model can be expanded to monitor the developing cities and industrial zones for pollution monitoring. To protect public health from pollution, this model provides an efficient and low cost solution for continuous monitoring of environment.

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