International Journal of Scientific Research in Science, Engineering and Technology
Print ISSN: 2395-1990 | Online ISSN : 2394-4099 (www.ijsrset.com)
doi : https://doi.org/10.32628/IJSRSET

IOT based Environmental Monitoring System on Blynk Server

Pavan Jadhao[1], Tushar Fule[2], Yogesh Kapgate[3], Payal Mendhe[4], Ankit Chandewar[5], Dharamveer Choudhary[6]
[1, 2, 3, 4, 5] Student, Department of Electronics & Telecommunication Engineering, J D College of Engineering & Management, Maharashtra, India
[6]Assistant Professor, Dept. of Electronics & Telecommunication Engineering, J D College of Engineering & Management, Maharashtra, India

Article Info
Volume 8 Issue 2
Page Number: 362-367

Publication Issue :
March-April-2021

Article History
Accepted : 20 April 2021
Published : 26 April 2021

ABSTRACT

In this paper, we have proposed an Internet of Things (IoT) based a real-time environmental monitoring system. Internet of Things (IoT) plays an important role in today's world through a vast and persistent system of sensor networks concerned to the environment and its parameters. In 21st century there is an extreme growth is industrial infrastructure l frameworks creating environmental affairs like atmospheric changes, malfunctioning and pollution. Due to extreme growing vehicle and environment affecting factors there are sudden changes in climate and other element of environment. This sudden climate changes affects physically on human body. Since it is necessary to monitor this environmental elements to being safe and fit physically[2]. We have developed this concept to monitor this environmental elements or factors of intrest like temperature, Humidity, Dust Concentration, external Air pressure on ground level.

Keywords : NodeMcu, Temperature Sensor, Flame Sensor, Smoke Sensor, IoT, Relay

I. INTRODUCTION

Internet of Things (IoT) is expected to transform the world by making it possible to monitor and control important environmental phenomena using the devices/sensors capable of capturing, processing and transmitting the data wirelessly to the remote storage like the cloud services which stores, analyzes and exposes this data as a meaningful information. NodeMcu based IoT empowered Environment Monitoring and observing framework is that declare this issue. During this task, we've assembled a hearth finder utilizing NodeMcu which is interfaced with a temperature sensor, dust sensor, and pressure sensor. Over an Internet we are using flexible wi-fi sensor ESP8266[1]. The data from these sensors is stored in the cloud. After processing, through hotspot web browser will ask about IP address, by putting IP address web page will create that allows us to monitor the Environmental Factors.

Copyright: © the author(s), publisher and licensee Technoscience Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited

IOT is newly developed technology in which the connectivity between physical objects along with controllers, actuators and sensors synchronized over an Internet. IOT able to provide means to monitor the quality of parameters like Air, Noise, Temperature, Humidity and Light [2]. It helps concern authorities to take action against pollution crossing beyond defined level. The proposed system that we are proposing uses the Broadcast based approach wherein multiple devices subscribe for a MQTT topic (T) with the Broker. Temperature and humidity values are received from DHT11 sensor and processed by the ESP8266 NodeMCU. Sensor readings from NodeMCU are published to the AWS IOT core that maintains the Shadow table for this Topic (T).

The whole world is working in a comprehensive manner to protect the environment for sustainable agriculture, growth and a healthy society and therefore the main aim of SEM is to address the challenges due to undesirable effects in the environment through smart monitoring so that all key indicators of growth, including the health of society, are well regulated.

II. LITRECTURE SURVEY

The current research suggests that environment monitoring systems are implemented smartly as SEM for various purposes and using different methods. A huge number of contributions on SEM, both based on purposes and types of methods, have been studied and therefore the related research has been discussed in three main subsections, namely the study based on smart agriculture monitoring systems (SAMs), smart water pollution monitoring systems (SWPMs), and smart air quality monitoring systems (SAQMs). Recently climatic change and environmental monitoring and management has received much attention. The paper introduces three different IoT based wireless sensors for environmental and ambient monitoring: one employing User Datagram Protocol (UDP)- based Wi-Fi communication, one communicating through Wi-Fi and Hypertext Transfer Protocol(HTTP) and third one using Bluetooth Smart. The above presented systems help in recording data at remote locations and viewing it from every device with an Internet connection. Here, Zigbee is employed to watch and control application where wireless connectivity is required. UDP based cyber physical system monitors the temperature and ratio. Here the losses are caused by the network itself. The WiFi sends the UDP or HTTP packets to a Cloud Platform which makes it available only to the administrator who decides where the data must be public or private. The main role of updating data continuously is finished by Blynk, which has APIs for collecting data produced by sensors and APIs for reading that data from applications. The paper is split into two parts. One a part of the paper is where one must Program a thing to send data. And, the second part is where the opposite needs to see the info. Blynk sits within the middle and makes it handy to try and do both. The paper uses easily accessible hardware to create a proof-of-concept IoT system to observe air temperature, humidity, soil moisture, soil humidity etc. Further this could be modified with different sensors or actuators for building something for individual purposes. Thus a right away access to any or all the environmental parameters is given to the user after the above stated procedure is completed.

IoT service provides a simple but powerful capability to interconnect different kinds of devices and applications all over the world. IoT service acts as MQTT broker and is thus responsible for distributing message to connected clients. Devices and applications communicate with MQTT broker using MQTT protocol.

III. SYSTEM ARCHITECTURE

In fig1. Shows all the sensors deployed on this system which detects different element of environment. All

this detected data from sensors forwarded to microcontroller which is based on Arduino. Microcontroller will process all data from sensors and upload it on cloud server based on blynk application. All this sensor value will shown on the Blynk Application.

Fig.1 Block Diagram

3.1 Hardware

- NodeMcu Esp8266 Controller
- Temperature & Humidity Sensor(DHT11 Sensor)
- LDR
- Pressure Sensor(BMP180)
- Dust Concentration Sensor
- Adaptor Power Supply

3.2 Flow Chart

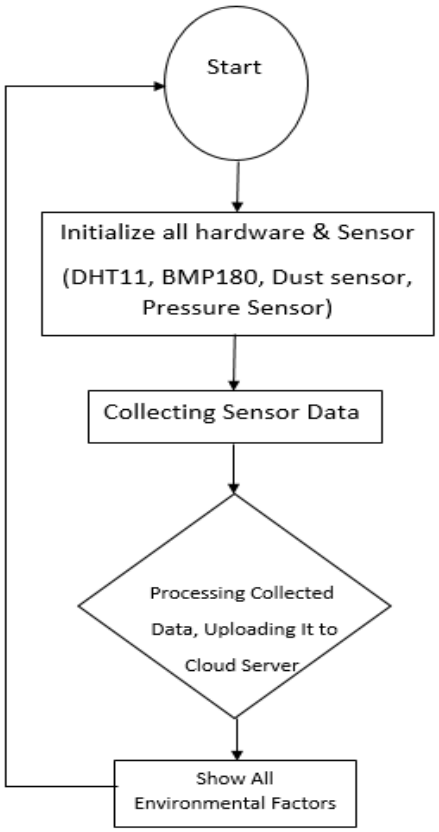

Fig 2. Flow chart

This regional environmental monitoring system design to monitor and notice and manage the condition with respect to environmental condition or climate change.

This System consist of NodeMCU esp8266 microcontroller with Humidity and Temperature Sensor(DHT11), Dust Concentration Sensor, Pressure sensor(BMP180).All this sensors are deployed on this regional environmental monitoring system in particular circuit. The sensor DHT11 is use to detect live temperature and humidity its detect live temperature and humidity and forward it to microcontroller. Dust concentration sensor detects the toxic dust particles in air. This sensor inspect live air quality also gives the input to the microcontroller.BMP180 pressure sensor detects the pressure in air so that it can find the quality of air in

live environment. This BMP180 also give the data to the microcontroller as an input. All this sensor in this system works as an input sensor.

Microcontroller esp8266 process this data in the proper format and forward it to esp8266 wifi module also upload this data to cloud sever in blynk cloud. Microcontroller esp8266 work on 5v dc input power supply. And all this sensor are also works on 5v input given by nodeMCU. Esp8266 also required internet as it is based on IOT concept. In esp8266 there is inbuilt wifi module which make this system online or connect the system with internet.

This process data will be monitored or shown on cloud server of authorized person which this system belongs to. This data can be easily view on blynk mobile application.

NodeMcu Controller

Fig. 3 Node MCU

NodeMCU is an open-source Lua based firmware and development board specially targeted for IoT based Applications. It includes firmware that runs on the ESP8266 Wi-Fi SoC from Expressive Systems, and hardware which is based on the ESP-12 module.

LDR Sensor

The Light Dependent Resistor (LDR) is just another special type of Resistor and hence has no polarity. Meaning they can be connected in any direction. They are breadboard friendly and can be easily used on a perf board also. The symbol for LDR is just as similar to Resistor but adds to inward arrows as shown above. The arrows indicate the light signals.

Fig.4 LDR Module

Temperature & Humidity Sensor (DHT11)

The DHT11 is a basic, ultra-low-cost digital temperature and humidity sensor. It uses a capacitive humidity sensor and a thermistor to measure the surrounding air, and spits out a digital signal on the data pin (no analog input pins needed). It's fairly simple to use, but requires careful timing to grab data.

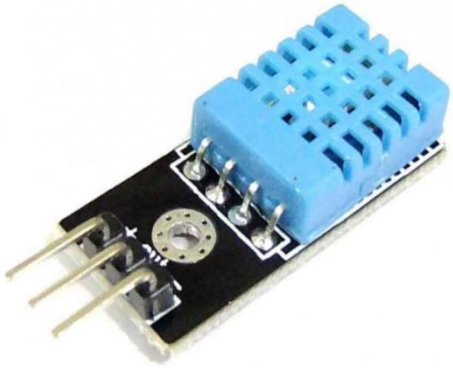

Fig.5 DHT11

Pressure Sensor (BMP180)

BMP180 is one of sensor of BMP XXX series. They are all designed to measure Barometric Pressure or Atmospheric pressure. BMP180 is a high precision sensor designed for consumer applications. Barometric Pressure is nothing but weight of air applied on everything. The air has weight and wherever there is air its pressure is felt. BMP180 sensor senses that pressure and provides that information in digital output. Also the temperature

affects the pressure and so we need temperature compensated pressure reading. To compensate, the BM180 also has good temperature sensor.

Fig 6. BMP180 (Pressure Sensor)

Dust Concentration Sensor

Sharp's GP2Y1014AU0F is a tiny six-pin analog output optical air quality/optical dust sensor that is designed to sense dust particles in the air. It works on the principle of Laser Scattering and is especially effective in detecting very fine particles like cigarette smoke, and is commonly used in air purifier systems. This sensor consists of an infrared emitting diode and a phototransistor. It works with a nominal 4.5V to a maximum of 5.5V DC supply voltage. However, it typically works with 5.0V DC voltage and requires a maximum of 20mA currenteasy. It can measure a wide range of temperature from -55°C to +125°C with a decent accuracy of ±5°C.

Fig 7. Dust Sensor

IV. RESULTS

We implement four different sensors in our system that are humidity & temperature sensor (DHT11), Dust concentration and pressure sensor and LDR sensor all this four sensor sends reading to NodeMcu controller and NodeMcu send all this information real-time on Blynk server we already set all sensor threshold value by studying and checking environmental parameter if any sensor reading exceeds threshold value it sends an alert message to concern person to server of iot application such as Blynk as shown in fig.8

Fig.8 Snap IoT Application

Fig. 8 shows the user interface of IoT application have to separate gauge for shows real-time the sensor value another gauge for showing status of LDR sensor.

V. CONCLUSION

On our system, we read four different parameters for detecting. These Four parameters are Pressure, Dust Concentration, Humidity and temperature this will helps to improve the accuracy of detecting Regional

Live climate change. It will help to detect Air Quality on any condition more accurately and fast.

Also, this system is based on IoT technologies so real-time sensor data and alert messages send to the concerned person so our system detects Climate changes live environmental factors faster and accurately.

VI. REFERENCES

[1]. IOT BASED ENVIRONMENT MONITORING SYSTEM Innovation by: Roni Mondal, Publish Date : July 16, 2019 2] Advances in Smart Environment Monitoring Systems Using IoT and Sensors by Silvia Liberata Ullo 1,*OrcID and G. R. Sinha

Cite this article as :

Pavan Jadhao, Tushar Fule, Yogesh Kapgate, Payal Mendhe, Ankit Chandewar, Dharamveer Choudhary, "IOT based Environmental Monitoring System on Blynk Server", International Journal of Scientific Research in Science, Engineering and Technology (IJSRSET), Online ISSN : 2394-4099, Print ISSN : 2395-1990, Volume 8 Issue 2, pp. 362-367, March-April 2021.
Journal URL : https://ijsrset.com/IJSRSET218290