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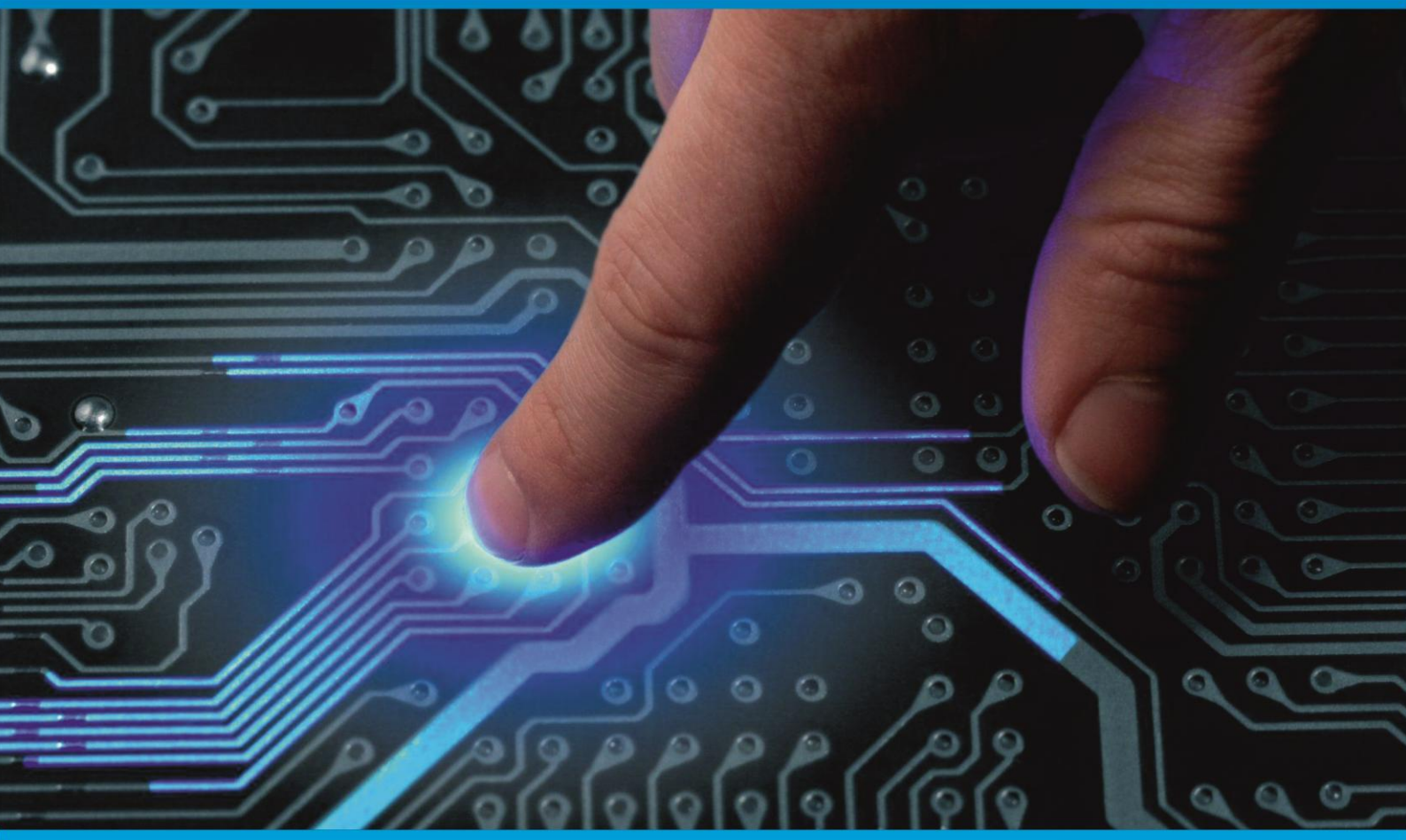

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IoT based Weather Monitoring System

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ABSTRACT: The model proposed in this study is an innovative method for tracking the climatic conditions for a specific place. IoT " Internet of Things" is the concept that's being used here, It's a innovative & effective way to link to the internet and join the entire universe of things on the network. The wireless sensors are used to verify and track the weather parameters here. The framework deals with tracking the climatic conditions such as temperature, humidity, rain level and CO level with the help of sensor and also passes the details to the website, then marks the received information as statistics in graphic form. Updated data from the system introduced can be accessed online from every part of the globe.

KEYWORDS: Internet of Things(IOT); MQ6 Sensor; Arduino; ESP8266; DHT11 sensor; rain Sensor;

I. INTRODUCTION

With the introduction of high-speed Internet linking more and more people across the globe as become possible. The Internet of Things (IoT) goes a step further, linking not only people but electronic devices that can communicate among themselves. With Wi-Fi enabled devices reducing costs this trend will only gather more thrust. [1] The main concept behind the Internet of Things(IoT) is to connect variable electronic devices via a network and then retrieve the data from these devices (sensors)that can be distributed in any fashion, upload them to any cloud service where the collected information can be analysed and processed. In the cloud service. These data may be used to inform people by different means, such as using a buzzer or sending them an e-mail or an SMS, etc.

Future technology is to bind the whole world in one place. It is possible to link all objects, items and sensors to transfer the information obtained at different places & process / analysis data to organize applications such as traffic signalling, mobile health tracking in medical use and methods of industrial protection, etc. According to technology expert projections, by 2020, 50k million items will be associated in IOT. IOT provides a large range of interface communication with different protocols and different application properties to receive the maximum user interaction. The value of monitoring the environment today is important in many respects. Climate monitoring is important to maintain good crop growth, to ensure safe industrial working conditions etc. Constant Technological progress made the scanning phase of environmental parameters much simpler than in the past. [2] These sensors are Electronic instrument commonly used to measure various natural physical and environmental parameters.

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The results would be reliable by using sensors to analyse climatic conditions and the entire system will use less resources, and there will be faster response. Here the newly created system describes the weather observing station 's control. [3] It includes wireless technology, which also has Wi-Fi connectivity. Here the weather conditions are controlled and the website data updated. A weather monitoring system can be defined as a device that provides us with weather reports in our environment which makes it intelligent and interactive through wireless communication with objects. [1] For example, it can give us information of the atmospheric temperature, humidity, rainfall level and CO level etc. This system therefore essentially senses temperature, humidity, rain and CO levels for the specific place. The prototype contains different types of sensors which can be used to calculate all the above parameters. It can be used to track a given room / place temperature or humidity. Besides the aforementioned functionalities, we can also track the specific location's rain level. The prototype brain is Arduino UNO along with ESP8266 Wi-Fi board. The Arduino is connected by three sensors namely the temperature and humidity sensor(DHT11), the rainfall sensor (YL83), the MQ6 CO sensor. The framework manages observing and controlling the ecological conditions like temperature, relative moistness and CO level with sensors and sends the data to the website page and afterward

plot the sensor information as graphical insights. Refreshed information from the framework presented can be gotten to on the web from all aspects of the globe.

II. PROPOSED SYSTEM

For 24-hour weather surveillance, several high-end schemes are now possible to. But these systems are being plotted to monitor real-time weather for a particular place on a broad scale. This weather monitoring system uses three sensors to measure variations in the atmosphere and the climate, such as temperature, humidity, CO2 level and rain level. The values are then sent to the website; these values are then mark the received data as statistics in graphic form. Uploaded data from the system introduced can be accessed online from every part of the world. The model proposed is an innovative weather forecasting solution that makes its real-time data readily available over a very wide range using IoT.

III. REQUIRED COMPONENTS

A. COMPONENTS REQUIRED: HARDWARE

- EMBEDDEDSYSTEM:

A. ARDUINO

B. ESP8266-01

- SENSORS:

C. DHT11(HUMIDITY AND TEMPERATURESENSOR)

D. MQ6(COSENSOR)

E. RAINSENSOR

B. COMPONENTS REQUIRED:SOFTWARE

- IOTLIBRARY:

A. ARDUINOIDE

- CLOUDSYSTEM:

B. THINGSPEAK

IV. SYSTEM ARCHITECTURE

The device implemented is composed of a micro-controller Arduino Uno which is the primary processing unit for the whole system and It will be connecting all the sensors and devices to it. The sensors can be controlled via the Arduino Uno microcontroller. Micro-controller retrieves data from them and processes it. Sensor data is analyzed and transferred to the Internet via Wi-Fi module (EP8266) connect to it.

A. BLOCKDIAGRAM

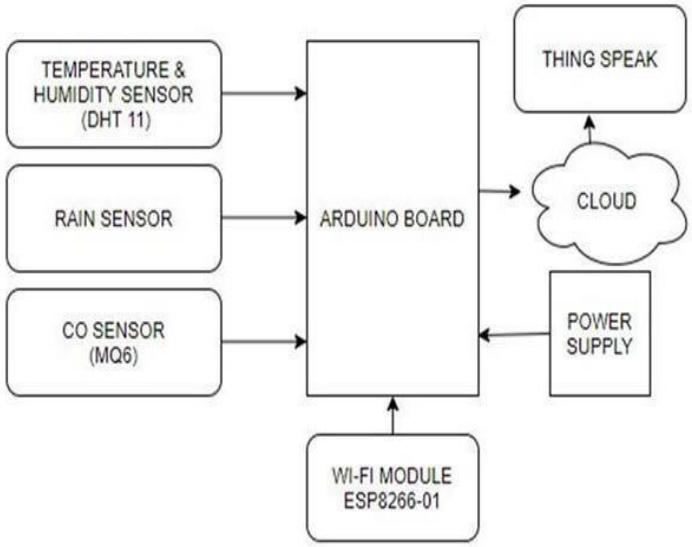

Fig. 1 Block Diagram of our weather monitoring system.

B. ARDUINO UNO WITH WI-FI MODULE EP2866-01

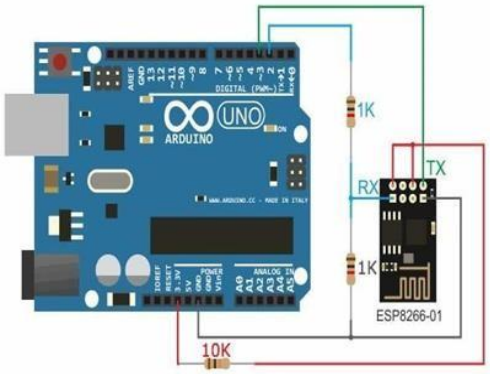

Fig 2. Arduino with Wi-Fi Module ESP8266-01

Arduino UNO is a microcontroller that is open source and a tool for The Internet of Things (IOT) which links hardware and sensors together. Cantered on the ATmega328P microchip. Massimo Manzi, along with his other colleagues David mellis and David cuatrilloes, built on Arduino.cc after operating on ATmega8 and making some small improvements and thus forked the project and replaced it with Arduino. [1] The Wi-Fi Module ESP8266 is a self-contained SoC with an optimized stack of TCP / IP protocols that can provide access to your system that can serve as a point of contact. OTA (Over-the-air) programming support, either for Arduino sketches or upgrading firmware, is one helpful feature of Uno Wi-Fi

C.SENSORS:

This weather monitoring system consists of sensors for temperature and humidity. (DHT 11), CO sensor and rainfall sensor (MQ 6). These three sensors can measure the temperature, humidity, rainfall and CO levels of the key environmental variables. All this sensor will give the analogue voltage reflecting one specific weather element. This analogue voltage will be transformed by the microcontroller into digital data.

D.TEMPERATURE SENSOR AND HUMIDITY SENSOR

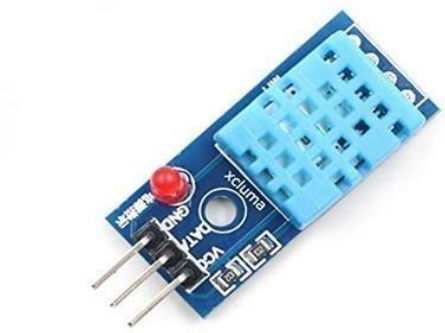

Fig. 3 Temperature and Humidity Sensor DHT 11

The DHT11 is a computerized temperature and humidity sensor, an essential, ultra-minimal effort. To gauge the surrounding air, it uses a capacitive temperature sensor and a thermistor and distributes the digital data on the data pin (no pins needed for analogue information). The serious drawback of this sensor you can't get fresh information from it once every 2 secs, so the data fetched by the user can be up to 2 seconds old for sensor readings while using this library. It runs on a 3 to 5-volt power supply. Good for 20-80 percent humidity with 5 percent precision and temperature ranges from 0-50 ° C. Precise measurements ± 2

E. CARBON MONOXIDE (CO)SENSOR

Fig. 4 Carbon Monoxide (CO) sensor MQ 6

Carbon monoxide (MQ6) sensor, is suitable for CO air concentration sensing. The MQ-6 has the capacity to detect CO gas. [1] Emphasis within the range of 20 to 2000ppm. The sensor is extremely capable of effect and has a quick reaction time. The analogue resistance is the sensor's yield. The circuit is amazingly simple; the 5V heater curl, including load resistance, is clearly inspected and linked to the output of ADC. For the approximate amounts of carbon monoxide in air, the normal reference methodology relies on Ingestion of radiation from infrared gas in a non-photometer dispersion This procedure makes safe use of establishments at fixed positions in control stations. [5] And more Studying presentation, convenient data-logging carbon monoxide analysers have proven to be available to people as of late.

F. RAINFALLSENSOR

Fig 5. Rainfall Sensor

The rain sensor module is a simple instrument for a particular place to detect rain levels. It can be used as raindrop comes through the rainy board as a turn and also to calculate the rainfall rate. [3] To detect the volume of rainfall, analogue output is used. The LED will turn on when there is no rain drop in the high DO performance induction board attached to the 5V power supply. When a small volume of water occurs on the induction surface, the transfer indicator will turn on while the DO output is low. Clean the water droplets off, and it creates high performance where it is returned to its original condition. [3] A weather sensor or weather switch is a disruptive system triggered by rainfall.

G. THING SPEAK

"As per its creators," Thing Speak "is an Internet of Things (IOT) open source programmer and API to store and collect information from things over the LAN using the HTTP protocol [2]. Thing Speak allows sensor monitoring applications, position tracking apps, and a social network of status update objects to be developed. Thing speaks incorporated help from Math Works' MATLAB numerical computing tools that enables people who use Thing Speak to analyze and Without involving the purchase of a Mat lab license from Math works, imagine uploaded data using Mat lab.

V. **ADVANTAGES**

1. IOT Based weather monitoring system project use Arduino UNO is Absolute mechanized.
2. It doesn’t require any personal attention.
3. We can get notice of weather conditions at any location beforehand.
4. Cost Effectiveness
5. Easy to deploy and autonomous
6. Low energy and low power
7. Accuracy is high.
8. Efficient.

VI. APPLICATIONS

1. The weather monitoring system will play a very crucial role in the field of industry, farms, agriculture. Etc.
2. It's beneficial at locations such as rain forests and volcanos
3. The weather monitoring system can help to take preventive measures against rains which can be destructive more often, winds, Too high or too low temperature.
4. The use of proposed system will help us survive with the ground frost and high temperature in summers

VII. FUTUREWORK

1. One can actualize a couple of more sensors and associate it to the satellite as a worldwide component of this framework.
2. Adding more sensor to screen other ecological boundaries, for example, CO2, Pressure and Oxygen Sensor.
3. In airplane, route and military there is an incredible breadth of this continuous framework.
4. It can likewise be actualized in clinics or clinical organizations for the exploration and study "Essentially of Weather on Health and Diseases", thus to give better safeguard alarms.
5. The IoT based Weather Monitoring System can be further changed and be utilized as an aircontamination meter, soil dampness checker and soon.

VIII. CONCLUSION

It enables the environment to be self-protected (smart environment) by having the sensors integrated in the monitoring environment. To implement this, sensors need to be installed to capture and interpret data in the particular area(environment). By adding sensors in the system, we can put the world into real life, i.e. it can interact across the network with other artefacts. The product of the processing of data and data analysis will then be made accessible via Wi-Fitotheenduser.Thisoffersaclevermeansoftrackingtheatmosphereandaneffective,low-costembeddedsystem. With the Internet of Things theory, which is experimentally tested to control four parameters, which are temperature, humidity ,rain and CO can be monitored. The parameters for the sensor will also be submitted to the cloud (Thingspeak). Suchinformationcanbevaluableforfurtherstudyandcouldbeeasilyexchangedwithotherendusers.Modelproposed can also be extended to track further data This model provides an accessible and low-cost solution to continuous atmospheric surveillance to safeguard public health from emissions.

REFERENCES

1. Girija C Department of Electronics and Communication, NIEIT, Mysuru Andreanna Grace Shires Department of Electronics and Communication, NIEIT, Mysuru Harshalatha H Department of Electronics and Communication, NIEIT, Mysuru Pushpalatha H P Department of Electronics and Communication, NIEIT, Mysuru. Internet of Things (IOT) based Weather Monitoring System International Journal of Engineering Research & Technology(IJERT) ISSN: 2278-0181 Published by, www.ijert.org NCESC – 2018 ConferenceProceedings
2. Ravi Kishore Kodali and Snehashish MandalNational Institute of Technology, WarangalWARANGAL, 506004 INDIA. IoT based weather station 2016 International Conference on Control, Instrumentation, Communication and Computational Technologies(ICCICCT)
3. Ramesh Babu, Assistant Professor M.Asha (Student), M. Bharani (Student), Y.Chandramouli (Student), S.Mohammad Salman (Student), L.Naviteja Reddy (Student) Computer Science and Engineering Annamacharya Institute of Technology and Sciences, Rajampet,India.
4. Anita M. Bhagat1, Ashwini G. Thakare1, Kajal A. Molke1, NehaS. Muneshwar1, Prof. V. Choudhary2 1BE Student, 2Associate\ Professor 1,2Department of Electronics and Telecommunication, 1,2J.D. College of Engineering and Management, Nagpur, Maharashtra, India IOT Based Weather Monitoring and Reporting System Project-2019
5. 1Arun Chakravarthy R, 2Bhuvaneswari M, 3Arun M iot based environmental weather monitoring and farm information tracking system International Journal of Trend in Scientific Research and Development (IJTSRD)-2018
6. Bulipe Srinivas Rao1 , Prof. Dr. K. Srinivasa Rao2 , Mr. N. Ome3 Internet of Things (IOT) Based Weather Monitoring system International Journal of Engineering Research & Technology (IJERT) ISSN: 2278-0181 Published by, www.ijert.org NCESC - 2018ConferenceProceedings.

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