INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 8.165

Android App to Track Pollution using IOT Sensor

Pratik Chopade, Meghraj Patil,Munna Shaikh, Sudarshan Gujar, Abhijeet Awad

Guide, Head of Department, Department of Computer Science, JSPM'S Rajashri Shahu College of Engineering,

Pune, India

Lecturer, Department of Computer Science, JSPM'S Rajashri Shahu College of Engineering, Pune, India

Student, Department of Computer Science, JSPM'S Rajashri Shahu College of Engineering, Pune, India

ABSTRACT: Today, due to the increase in emissions from cars, greenhouse gas emissions are growing rapidly and creating daily health problems in the environment. Since we can control pollution as an individual, we are proposing a model that will help people to control themselves and protect them with their smart phones with the help of an app called Blynk. More than 35% of the population lives in urban areas of India. The urban population is constantly on the rise and is expected to exceed 50% over the next ten years. This will require increased traffic, additional construction and industrial development. In addition, pollution can lead to acid rain, global warming, and pressure on medicine. In particular, the humanoid cannot predict or determine whether airborne is good or bad. Therefore, a measurement tool is required to check the air quality. Proposed research design to measure air quality using esp8266 module and gas detection sensors (MQ6) and temperature measurement (DHT11) in PPM.Final air quality results can be displayed on a smartphone by connecting to Wi-Fi via ESP8266. The latest technologies based on Internet of Things (IoT) in our air quality monitoring study are playing an important role. The BLYNK app is made on a smartphone where prices are monitored directly by users and receive a notification or warning when air quality worsens.

KEYWORDS: Blynk, IoT, Pollution, Sensors, NodeMCU, LM35

I. INTRODUCTION

Air pollution has a greater impact on the environment than air quality itself and is already 4 the leading cause of death worldwide. Globally, air pollution reduces life expectancy further over 1.5 years. It leads to climate change, ozone depletion, water level, acid rain, change biodiversity and global warming. Chemical pollutants released from the air as suspended particle, nitrogen monoxide, benzene, ethylene, sulfur dioxide, carbons oxide have a negative impact on human health and lead to diseases such as lung cancer, bronchitis, asthma, artery disease, lung diseases. It leads to premature death for many more than 2 million Indians. Around the world more than 5 million people die directly as a result of air pollution

pollution. Compared to 64 percent of the world's air pollution deaths 10,000. India clocks the highest rate of 134 out of 10,000. India has a slower pace of money the greenhouse gas exhibition still ranks third in the world after China and the US. There it is the growing economic cost of air pollution. While the USA carries $ 600 billion, China and India carry $ 900 billion and $ 150 billion respectively. Pollution monitoring is one of the major challenges in tackling air pollution and lack of monitoring resources. As Satellite data has been suggested, there are a number of cities that may be at risk of serious air pollution but are not currently under surveillance. Many cities have hand-operated monitoring systems that provide data slowly and are subject to human error. Strong air pollution monitoring systems are needed to alert people to take appropriate action in case of extreme weather.

Many people have begun to buy air purifiers that show that most air-conditioned solutions are imported from abroad. Such tools and solutions are aimed at foreign climates. A recent joint research by Assocham-Tech Sci on air purifiers in India projects the market is expected to grow from $ 14.14 billion to $ 38.99 million by 2023 alone. In order to improve air quality various measures to be taken by the Indian government, the Government of India considers the issue of air quality improvement a priority and has implemented the National Clean Air Program to focus on reducing particles
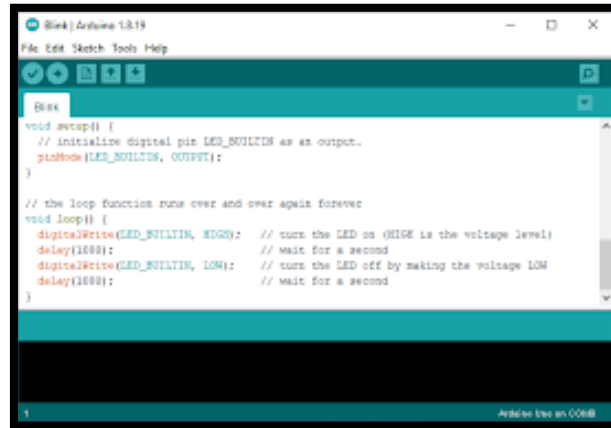
(PM) by 20-30. % by 2024.

II. REVIEW OF LITERATURE

Air quality is a term related to how much air is in the air. Good air quality means less air pollution, while lower air quality means more pollution. Clean or unpolluted air is considered a basic requirement for human health. However, air pollution continues to be a major threat to human health worldwide. The prevalence of air pollution should be monitored to increase public awareness of air quality. Indoor air quality is important for maintaining a person's health because people spend most of their time indoors. Indoor air quality can be polluted by many substances, such as Respiratory Particles, Asbestos, Carbon Monoxide, Mercury, Volatile Organic Compounds, Formaldehyde, Internal Allergens, Indoor Pesticides, Radon, Fungus internal and Natural Tobacco Smoke. A monitoring system can increase a person's awareness of air quality inside the room. There are levels of pollution that people need to avoid based on the Air Pollution Index. Table 1, shows the level of risk contained in air pollution.

III. METHODOLOGY

The course of action for this project consists of a flow chart and a block diagram, describing the entire route taken during the project. In addition, this section also introduces software development and hardware development. To improve the system, it begins with designing the system. System design concludes by identifying the appropriate component. After every part has been counted, the next step is to build the whole section. This section will focus on coding using IDE software. The program will be completed and completed once the system is ready. NodeMCU is an open-source software and hardware development environment built around a very low-cost system associated with ESP8266. With a simple NodeMCU it is defined as an open source base for firmware designed for ESP8266 Wi-Fi chip. The open source NodeMCU hardware design is open to editing, modifying or building a new NodeMCU development board just like anyone can edit a manufacturer and market their MCU development boards converted. We can often see AmicaNodeMCU development boards and DOIT on the market. All settings are connected to software that is designed to be a lightweight writing language that is just editing language. The form in which it is the programming language written to the hardware device is a permanent memory. Fixed memory is a type of random-access memory whose content is stored whenever hardware resources are turned off to process an external power source by testing the performance of the ESP8266 chip. The NodeMCU firmware comes with the ESP8266 development board which is the NodeMCU development board. There are two versions of node MCQ such as ok NodeMCU 0.9 and NodeMCU 1.0. The NodeMCU development board consists of an ESP8266 chip, a Wi-Fi enabled system and a clear-built chip model widely used in the development of embedded IoT applications. In ESP8266 the ESP-12E is a model embedded with 10 silica L1R6 32-bit microcontroller and this ESP8266 with 2.4GH Wi-Fi cap volts, standard input, output pins and serial i2c connections are integrated circuit. and analog to digital conversion. and a serial peripheral interface which is an SPI serial communication protocol with UART and pulse with modulation. External SPI flash memory stores user data. NodeMCU board is powered by Wi-Fi, unlock PIN, digital pins and serial communication protocol. The proposed project is to set the Foundations for IoT Air Quality Monitoring System. Contains a microcontroller namely, NodeMCU, Mq135 (Air Quality Sensor), LM35 (Temperature Sensor), LCD 16x2 i2C, Breadboard for all communication, Jumper wiring.

• This Arduino IDE forum contains two main components: 1. Editor: used to write the required code. 2. Compiler: used to compile and upload code.

• Arduino IDE is available for most operating systems. Software Working Part: (BLYNK App) Introduction: BLYNK is a platform used to control small controls, Arduino, Raspberry Pi and many more online. It has IOS and Arduino apps to control. Digital dashboard that helps build a visual connection for projects. It's an easy way to pull and drop.

Step 1 Download the app. Re-Create Account and Sign In. Later you will need to install the BLYNK Arduino libraries that help generate firmware when using ESP8266.
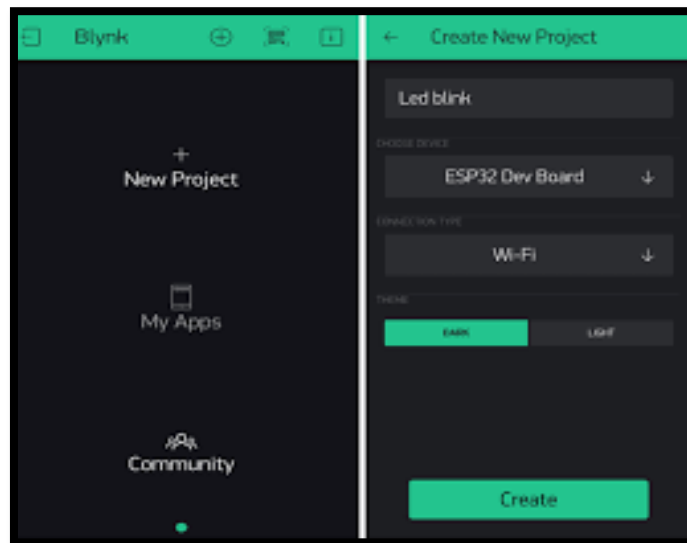
Step 2i) Create a New Project to build a new BLYNK Project. ii) Enter the name of the project. iii) Select NODE MCU. iv) Select the connection type and select Wi-Fi. v) Select the Black Theme and press the Create button. vi) The auto token will be generated and sent to the registered email ID. vii) The default token must be stored and copied for a long time.

Step 3i) Open a new project page. ii) Right-click on the project window showing the widget box. iii) Enter the required widgets for the project. iv) By scrolling down to find the LCD option, click on it and make the necessary settings Open the Arduino IDE and rotate the file.

Step 6 To get the message, open the serial monitor setting after loading the code. Then in the top right corner of the Blynk app screen click the run button. Now look at the values displayed on the LCD.

DHT sensor function is very simple. The DHT11 sensor contains a capacitive humidity sensing feature and a temperature sensor thermistor. A moisture-sensitive capacitor has two electrodes with a substrate that trap moisture as a dielectric between them. A change in capacitance value occurs with a change in humidity levels. The IC rating, we consider, has changed the resistance values and converted them into digital values.

To measure the temperature this sensor uses a Negative Temperature coefficient thermistor, which causes a decrease in its resistance to rising temperature. For a higher degree of resistance to even small temperature changes, this sensor is usually made of semiconductor ceramics or polymers.

DHT11 temperatures range from 0 to 50 degrees Celsius with 2-degree accuracy. The relative humidity of this sensor ranges from 20 to 80% with an accuracy of 5%. The sample rate of this sensor is 1Hz .i.e. provides one reading per second. DHT11 is small in size with an operating voltage of 3 to 5 volts. The maximum current used while measuring is 2.5mA.

Blynk is built for Internet of Things. It can remotely control computer hardware, display sensory data, can store data, visualize it, and do many other good things. Every time you press a Button on the Blynk app, the message goes to the Blynk Cloud, where you find the path to your hardware by magic. It works the same way on the other side and it all happens in an instant.

There are three main sections in the platform:

Blynk App - lets you create amazing links for your projects using the various widgets we offer.

Blynk Server - responsible for all communications between
smartphone and hardware. You can use our Blynk Cloud or use your local Blynk server locally. It is open source, can easily handle thousands of devices and can be introduced on the Raspberry Pi.

Blynk Libraries - for all popular hardware platforms - make it easy to connect to the server and process all incoming and outgoing commands.

ADVANTAGES:

Default notifications
You will receive automatic alerts for activities such as high and low temperatures. In this way, you can learn when the quality of your products might be compromised or to what extent.

Temperature changes notifications
A slight change in temperature will alert the monitoring system, and you will receive a notification about an increase or decrease in temperature. It will help you to contact the transport team and inform them of the situation as soon as possible.

Reports
The temperature monitoring system will automatically generate reports that you can analyze trends and take new steps accordingly.

Tracking temperature
Now you do not need to call or check in order to keep up to date temperature readings or to get updates on products. With a temperature monitoring system, you can easily track temperature changes.

Custom clues
With a temperature monitoring system, you can customize easily and minimal indicators based on product type or container. You can also reset the directions on the go to reflect changing needs.

DISADVANTAGES:

- High initial cost.
- Low sensitivity.
- It requires a more complex measurement circuit.
- Large bulb size.
- Low absolute resistance.
- Current source needed.
- Less rugged in a high vibration environment.
- A bridge circuit is needed with power supply.

V. CONCLUSION

The project is entitled "Climate Monitoring using Blynk" which seeks to monitor the city's climate and is important for farmers. This project has achieved the objectives of having developed a weather monitoring system that can monitor the weather through the app, Blynk. Next, the project is also able to reflect current weather conditions in the weather monitoring system. Implementation of the implementation of a climate monitoring system using the Internet of Things (IoT) has been achieved. The system provides a low-power solution for monitoring climate and the environment. The monitoring system was tested externally and successfully updated sensory data. The data will be used for various analyzes and may not be shared with other people or users. This work has the potential to be implemented to monitor developing cities and industrial areas especially to monitor pollution. To protect public health from pollution, the system is also able to provide an efficient and cost-effective solution for the authorities. It is also ideal for continuous monitoring of the environment in the future.

REFERENCES

1. https://lynred.com/blog/thermal-sensors-characteristics-and-applications
2. https://www.researchgate.net/publication/355202163_Development_of_Blynk_IoT-Based_Air_Quality_Monitoring_System
3. https://www.xajzkjdx.cn/gallery/6-may2020.pdf
4. https://ijirem.org/DOC/5_iot-based-air-pollution-monitoring-system.pdf
5. https://www.researchgate.net/publication/343916788_Weather_Monitoring_System_using_Blynk_Application
6. https://robu.in/iot-based-temperature-and-humidity-monitoring-using-blynk-application/
7. https://theiotprojects.com/iot-based-temperature-control-fan-using-esp8266-blynk/
8. file:///C:/Users/HP/Downloads/Black%20Book%20Group%20A,%20Home%20Automation%20using%20NodeMCU.pdf
9. Quadcopter Image circuit diagram - https://forum.techidiots.net/forum/download/file.php?id=966&sid=31d2ab043a733536ba4dd529ee19c996.

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

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

Scan to save the contact details