iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 9 **Issue:** VIII **Month of publication:** August 2021

DOI: https://doi.org/10.22214/ijraset.2021.37337

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 9 Issue VIII Aug 2021- Available at www.ijraset.com

IoT Based Air Quality Monitoring System

Divya D M[1],Impana[2], Namrata Das [3], Nehala G[4], Shwetha G R[5]

[1]*Assistant Professor, Department of Information Science and Engineering, S. J. C. Institute of Technology,Chikkaballapur, India*
[2, 3, 4, 5]*Student, Department of Information Science and Engineering, S. J. C. Institute of Technology,Chikkaballapur, India*

Abstract: ***In both created and non-industrial nations, proceeded with openness to helpless air quality is a significant general wellbeing hazard. Poisons that add to helpless air quality are thought to cause over 2.5 million unexpected losses every year all throughout the planet. To monitor things, In this undertaking, we will make an IOT-based Air Pollution Monitoring System in which we will display the quality of air in the mobile application utilizing a GSM and will set off a caution when the air quality drops under a particular range, for example when there is an enough measure of gases which are hurtful like CO2, smoke, liquor, benzene, and NH3 present noticeable all around. It will show the air quality in the proportion of PPM on the LCD and on the versatile application with the goal that we can without much of a stretch screen it. We can use our mobile app to display the contamination level in this IoT project.***

Keywords: Internet of things, GSM, sensors, monitoring system, mobile app.

I. INTRODUCTION

The significant objective of the IOT Air and Sound Monitoring System is to battle air and sound contamination, which is turning out to be even more an issue nowadays. For a more promising time to come and better life for everyone, air quality should be checked and monitored. The Internet of Things (IoT) is turning out to be progressively mainstream because of its adaptability and minimal expense. The climate has adjusted because of urbanization, and the expansion in the quantity of cars out and about fundamentally affects environmental conditions. Gentle hypersensitive responses like aggravation of the throat, eyes, and nose, just as more critical issues like bronchitis, coronary illness, pneumonia, lung, and demolished asthma, are altogether unsafe effects of contamination. Checking gives convergences of air toxin and sound contamination, which can therefore be considered, deciphered, and introduced. We can decide how genuine air contamination and sound contamination are from one day to another by examining observing information.

II. METHODOLOGY

The model is planned utilizing the IoT innovation. It is reasonable, versatile IoT based Air quality observing framework which detects the ongoing encompassing information with the assistance of sensors MQ135 gas sensor which is utilized for detecting carbon monoxide, dust sensor which is utilized for detecting minute particles like smoke and sound sensor for to distinguish the force of sound, DHT11 temperature and moistness sensor. Blynk application, most regularly utilized IoT device, is utilized to store information and recover it on portable.

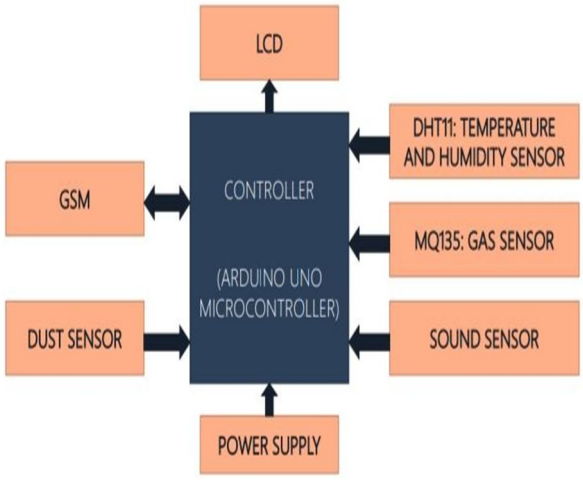


Figure 1: Block Diagram

©IJRASET: All Rights are Reserved

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 9 Issue VIII Aug 2021- Available at www.ijraset.com

III. MODELLING AND ANALYSIS

A. *Components Required*

1) *Arduino Uno microcontroller:* It is a flexible equipment stage that can be utilized dependent on 'ATmega328P', where it tends to be modified by the necessities. It is an open-source microcontroller gadget which has a property of getting to programming/equipment stage effectively and wide scope of sensors are viable.
2) *GSM (Global System for Mobile Communications):* It is open-source programming and a protected remote framework. It is a standard that was created to portray a convention for 2G cell networks which are utilized by cell phones like cell phones and tablets.
3) *MQ135 Gas Sensor:* MQ135 will detect different sorts of perilous gases like sulfide, alkali gas, benzene series steam and CO2. The recognition goes from 10 to10,000 ppm with a voltage rate is about 5.0V+-0.1V AC or DC.
4) *DHT11 (Temperature and Humidity sensor):* It is utilized to figure relative moistness and temperature using electrical opposition between the anodes.
5) *Dust Sensor:* It is useful in distinguishing the residue atom focus noticeable all around with the assistance of the optical detecting strategy.
6) *Sound Sensor:* It is utilized to distinguish sound waves from its power and which will change over into electrical signs, which thus shows the sound force in decibels. This sensor has a mouthpiece that sees the sound and cycles the ideal result.
7) *LCD (Liquid Crystal Display):* It is a level board show and used to get visual yield.

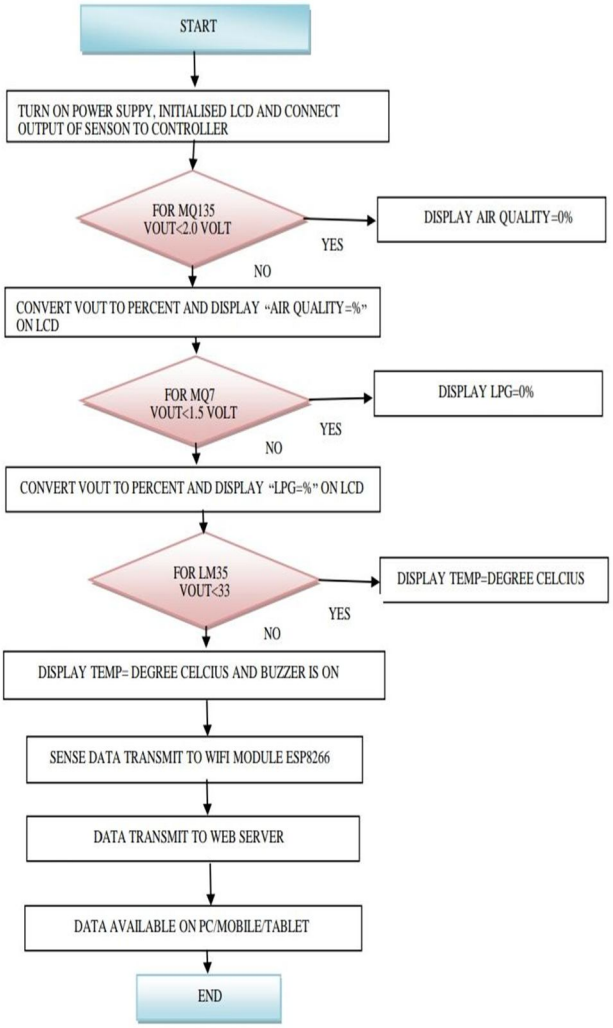


Figure 2 : Flow Chart

©IJRASET: All Rights are Reserved

This project start with associating the GSM with the Arduino. GSM runs on voltage of 3.4V-4.5V and in the event that assuming you give it as 5V from the Arduino, it may not work as expected and lead to harm. Both the grounds of Arduino and GSM are associated with one another. The pin 0 of Arduino is associated with pin TX of GSM and pin 1 of Arduino is associated with RX pin in GSM. GSM gives our ventures admittance to web. We utilize this rather than WiFi on the grounds that GSM is convenient, WiFi requires IP locations and additional arrangement dissimilar to GSM. Then, at that point we associate the sensor MQ135 and the Arduino. Likewise we interface the sensor's VCC and the ground pin to the 5V. Essentially ground of the Arduino and the sensor's Analog pin to the Arduino's pin A0. Then, at that point interfacing a signal to the Arduino's pin 8 which when valid, begins a blare sound. The NH3, liquor, NOx, CO2, Benzene, smoke and other different gases can be detected by MQ135, along these lines it is ideal sensor for gas discovery for our task. Once associated with Arduino, it begins detecting the gases, we get the degree of Pollution in (PPM) parts per million. MQ135 gas sensor's yield is in the terms of voltage levels and should be changed over into PPM. Subsequently for transformation of the yield in PPM, we utilize a library accommodated MQ135 sensor. The sensor's worth was 90 when there was no presence of gas around, 350 PPM is the protected degree of air quality and it should not surpass past 1000 PPM. Assuming this surpasses this breaking point, it prompts medical problems like cerebral pains, stodgy air, flat and if surpasses level of 2000 PPM, it might result in expanded/high pulse and a few such illnesses. Subsequently the signal shows with blaring sound when it surpasses the individual qualities. The application utilized here is Blynk App. It is an application manager. It empowers you to construct a few tasks. These ventures contain visual gadgets like virtual LEDs, esteem presentations, catches, and a terminal for text, interfacing with a few different gadgets. In our task it exceptionally assists with pushing the boundary information to the sensor.

IV. RESULTS AND ANALYSIS

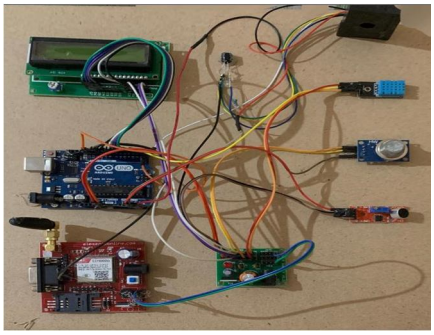


Figure 3 : Complete Model



Figure 4 : Mobile Application

©IJRASET: All Rights are Reserved

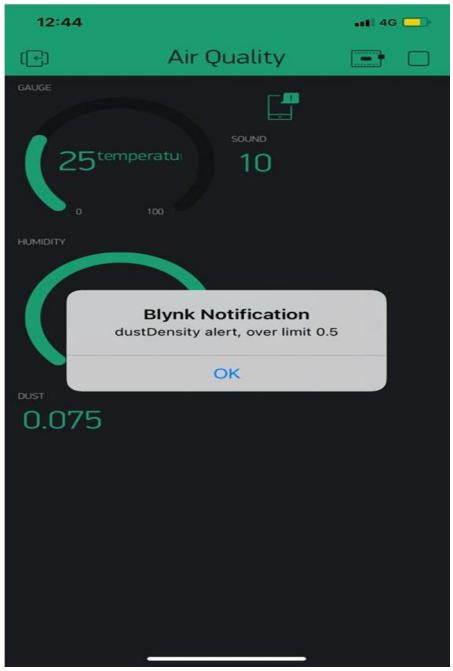


Figure 5 : Alert Message on App



Figure 6 : Result showing on both app and lcd

This project combines a process for sensing numerous gas levels in the air, as well as the ambient temperature and humidity, to determine the air quality. The gas levels and temperature are exhibited on an LCD display panel and in a mobile application that continuously displays the real-time output values of the gas sensors, temperature, and humidity sensors.

V. CONCLUSION

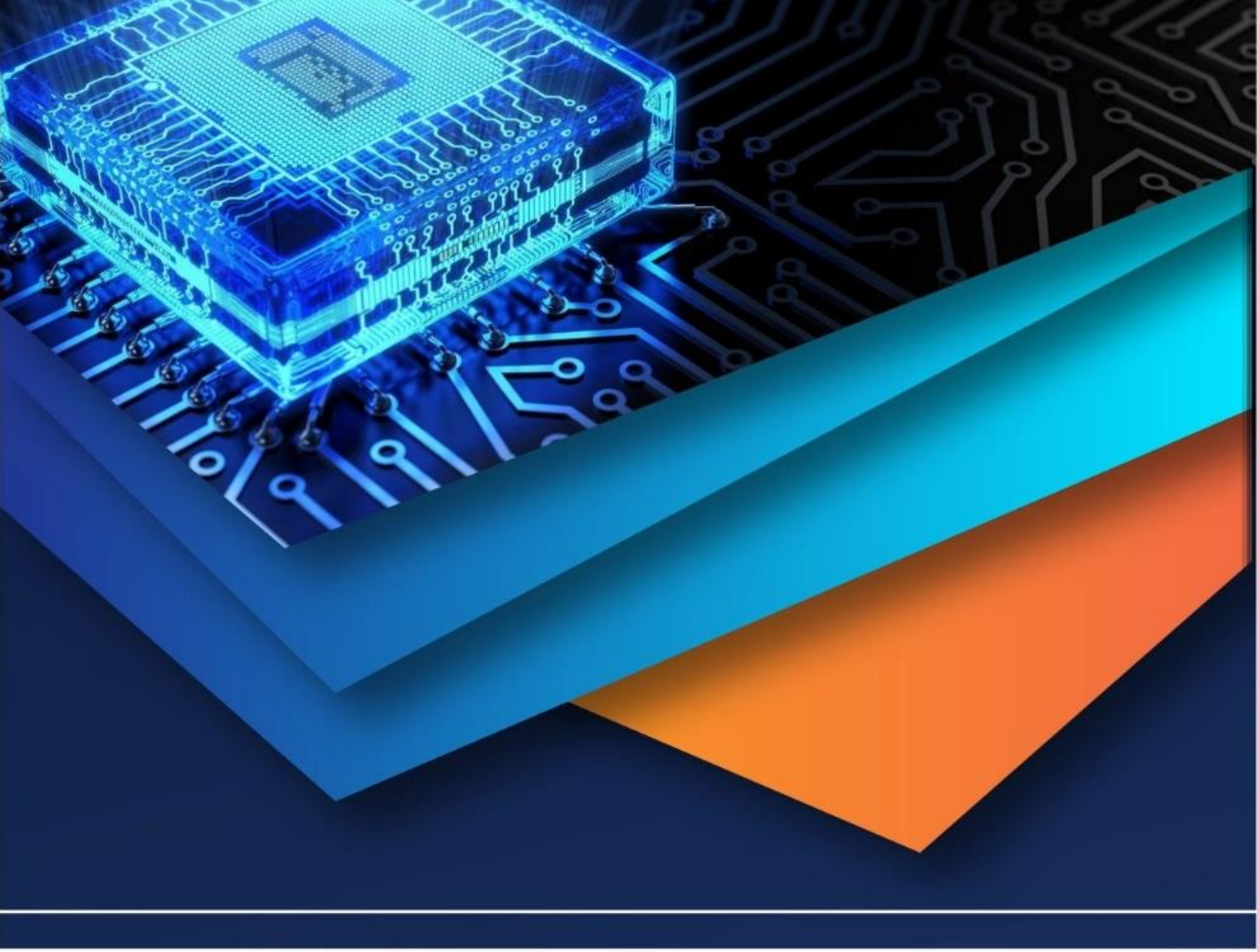
To further develop air quality, a framework to screen the climate's air using an Arduino microcontroller and IOT Technology is introduced. The utilization of Internet of Things (IoT) innovation works on the way toward checking numerous pieces of the climate, for example, the air quality observing issue examined in this examination. The MQ135 gas sensor is utilized here to distinguish a few sorts of hurtful gases, and Arduino is at the center of the venture, controlling the whole cycle. The GSM module interfaces the whole cycle to the web, and the visual yield is given by a LCD. The Automatic Air and Sound Management System is a stage forward in giving an answer for the most squeezing issue. The air quality checking framework takes care of the issue of vigorously contaminated spots, which is a critical issue. It empowers the utilization of new innovation while additionally stressing the need of carrying on with a solid way of life. This framework incorporates components that permit customers to screen contamination levels on their cell phones by means of an application.

©IJRASET: All Rights are Reserved

REFERENCES

[1] https://www.thinkercad.com/
[2] http://circuits.io/
[3] https://www.arduino.cc/
[4] https://circuitdigest.com/microcontroller-projects/ iot-air-pollution-monitoring-using-arduino
[5] RiteekaNayak, Malaya RanjanPanigrahy , Vivek Kumar Rai and T AppaRao:IOT based air pollution monitoring system Vol-3, Issue-4, 2017
[6] Navreetinder Kaur , Rita Mahajan and Deepak Bagai: Air Quality Monitoring System based on Arduino Microcontroller Vol. 5, Issue 6, June 2016
[7] PalaghatYaswanth Sai: An IoT Based Automated Noise and Air Pollution Monitoring System Vol. 6, Issue 3, March 2017
[8] 1 L.Ezhilarasi, 2 K. Sripriya, 3 A .Suganya , 4 K.Vinodhini .: A System for Monitoring Air and Sound Pollution using Arduino Controller with IOT Technology Vol. 3 Issue 2 (2017) Pages 1781-1785
[9] Exploring Arduino: Tools and Techniques for Engineering Wizardry by Jeremy Blum1st edition
[10] Ms. SarikaDeshmukh, Mr.Saurabh surrendering and Prof.M.P. Sardey:Air and Sound Pollution Monitoring System using IoT Volume: 5 Issue: 6

©IJRASET: All Rights are Reserved



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)