AIR QUALITY MONITORING USING NODE MICROCONTROLLER UNIT AND BLYNK SOFTWARE

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Abstract: Where pollution has become a major problem around the world, air pollution is the most dangerous, shocking and severe pollution among other pollutions e.g. water pollution, soil pollution, noise pollution, light pollution, thermal pollution etc. Air pollution is the major cause of diseases like asthma, cancer, bronchitis, birth defects and immune system like diseases. This system implements the combination of an android app, server, gas sensors (CO_2, CO, LPG, and CH_4) to sense the air quality of the environment and shows the real condition of air. Solving the draw backs of existing air quality sensors this device can be used to monitor various gasses at a time. The most demanding thing would be this system will give the real time data and will show the quality of the air based on the standard air quality. The system will give the user the indication of the air quality and based on given parameters it will let the user know how much the environmental air is polluted or safe. This system will do everything on behalf of human in such a way that for a smart city when people will have less time for spending and there will be more industry and air will be more polluted this device will let people know how safe the air is.

KEYWORDS: pollution**,** Air Quality Monitoring, server, blynk software,

1. Introduction:

Air Pollution Has Been A Global Challenge For Environment Protection. Effectively Collecting And Scientifically Visualizing The Air Quality Data Can Better Help Us Monitor The Environment And Address Related Issues. This Article Presents A Smart Sensor System For Air Quality Monitoring Which Consists Of Three Units: The Smart Sensor Unit, The Smart Phone, And A Server. Air Pollution Affects Our Day To Day Activities And Quality Of Life. It Poses A Threat To The Ecosystem And The Quality Of Life On The Planet. The Dire Need To Monitor Air Quality Is Very Glaring, Owing To Increased Industrial Activities Over The Past Years. People Need To Know The Extent To Which Their Activities Affect Air Quality. The Air Pollution Monitoring System Was Designed To Monitor And Analyze Air Quality In Real- Time And Log Data To A Remote Server, Keeping The Data Updated Over The Internet. Air Quality Measurements Were Taken Based On The Parts Per Million (Ppm) Metrics And Analyzed Using Microsoft Excel. The Air Quality Measurements Taken By The Designed System Was Accurate. The Result Was Displayed On The Designed Hardware's Display Interface And Could Be Accessed Via The Cloud On Any Smart Mobile Device. It Is Necessary To Monitor Air Quality And Keep It Under Control For A Better Future And Healthy Living For All. Here We Propose An Air Quality Monitoring System That Allows Us To Monitor And Check Live Air Quality As Well As Temperature And Humidity In A Particular Area Through Iot. System Uses Air Sensors To Sense Presence Of Harmful Gases/Compounds In The Air And Constantly Transmit This Data To Microcontroller. Also System Keeps Measuring Temperature And Humidity Level And Reports It To The Online Server Over Iot. The Sensors Interact With Microcontroller Which Processes This Data And Transmits It Over Internet. This Allows Authorities To Monitor Air Pollution In Different Areas And Take Action Against It. Also Authorities Can Keep A Watch On The Noise Pollution Near Schools, Hospitals And No Honking Areas, And If System Detects Air Quality And Noise Issues It Alerts Authorities So They Can Take Measures To Control The Issue.
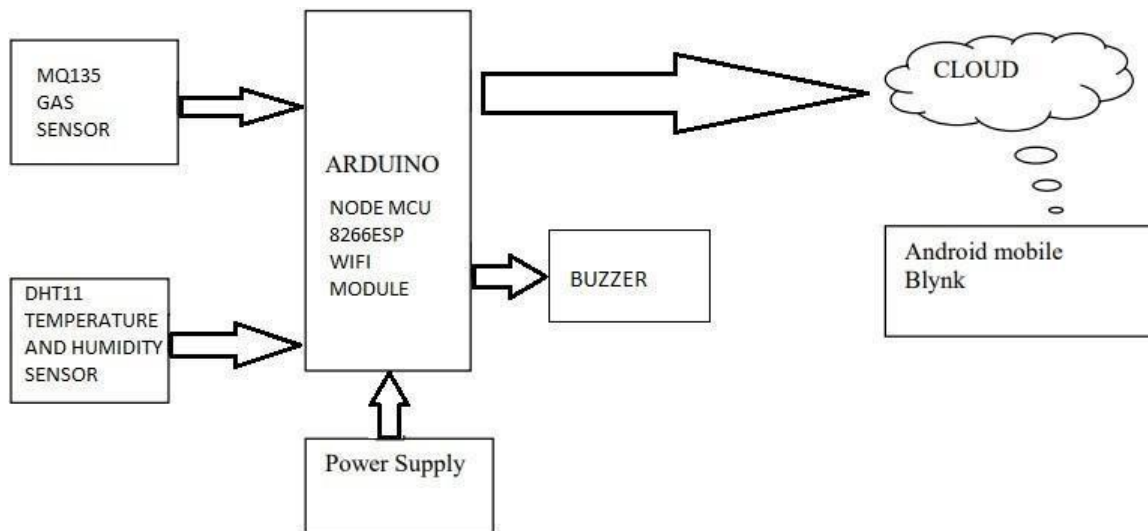
2. Block Diagram:-

Figure 1: block diagram

3 Principle of Working:

Node MCU acts as the microprocessor for the circuit. It is connected to MQ135. MQ135 is a gas sensor used for detecting the presence of a various type of gases. It is a dynamic gas sensor that can be detected using this sensor are NH3, NOx, alcohol, Benzene, smoke, CO2. The amount of gas is measured in parts per million. If the amount of gases exceeds the threshold value, the danger light will be switched on automatically along with the buzzer and air purifier. The system is connected to blynk application. It is a cloud service shows that the data from the sensor. These data can see in the different range of widgets each time the value changes execution. We can setup a gauge widget and can see the change in value with respect to quality of air detected. If the value ranges to the base value then the buzzer will get activated and a notification will appear in our mobile.System uses air sensors to sense presence of harmful gases/compounds in the air and constantly transmit this data to microcontroller. Also system keeps measuring sound level and reports it to the online server over IOT. The sensors interact with microcontroller which processes this data and transmits it over internet.The device to monitor the toxicity in the air environment is designed using Node MCU, IoT technology is implemented to control the air quality. By using IoT technology the process of monitoring the toxicity of air and controlling the various gases in the environment is proposed in this paper. The use of MQ135 sensor senses various hazardous gases and Node MCU is the heart of this application, which controls the whole process. Wi-Fi module controls all the process to the internet and monitor is used for displaying all the web pages over the internet.

4 Blynk Software:

Blynk Was Designed For The Internet Of Things. It Can Control Hardware Remotely, It Can Display Sensor Data, It Can Store Data, Visualize It And Do Many Other Cool Things.There Are Three Major Components In The Platform:
Blynk App: –It Allows You To Create Amazing Interfaces For Your Projects Using Various Widgets Which Are Provided.
Blynk Server: – It Is Responsible For All The Communications Between The Smartphone And Hardware. You Can Use The Blynk Cloud Or Run Your Private Blynk Server Locally. It's Opensource, Could Easily Handle Thousands Of Devices And Can Even Be Launched On A Raspberry Pi**.**
Blynk Libraries: –It Enables Communication, For All The Popular Hardware Platforms, With The Server And Processes All The Incoming And Outcoming Commands. Now Imagine, Every Time You Press A Button In The Blynk App, The Message Travels To The Blynk Cloud, Where It Magically Finds Its Way To Your Hardware. It Works The Same In The Opposite Direction And Everything Happens In A Blynk Of An Eye.
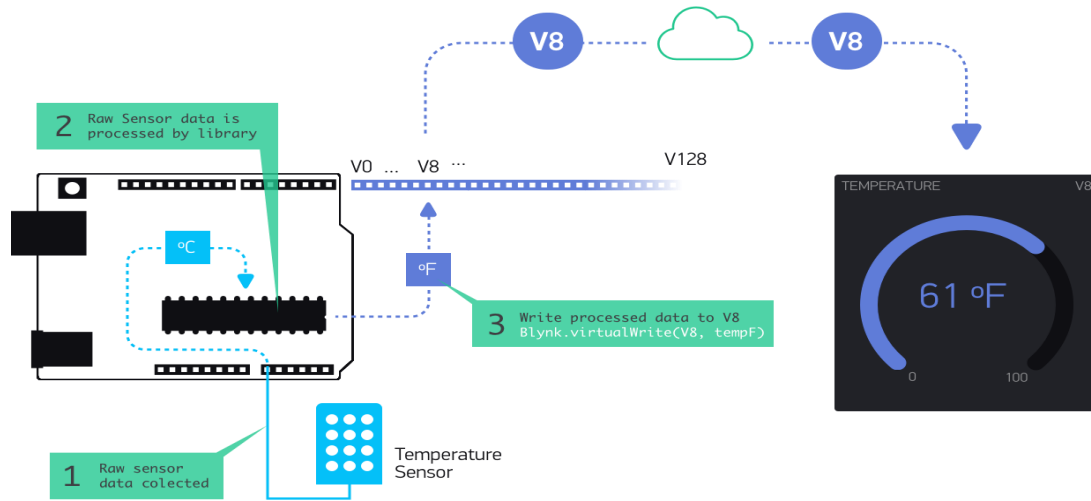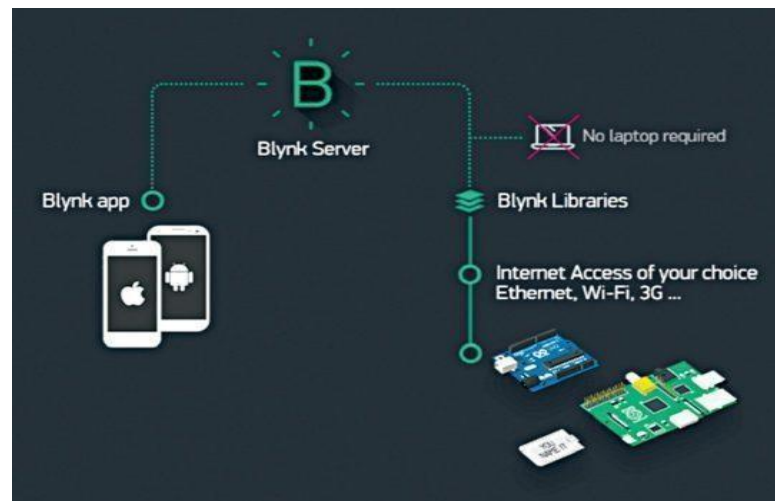
Figure 2:Blynk Application
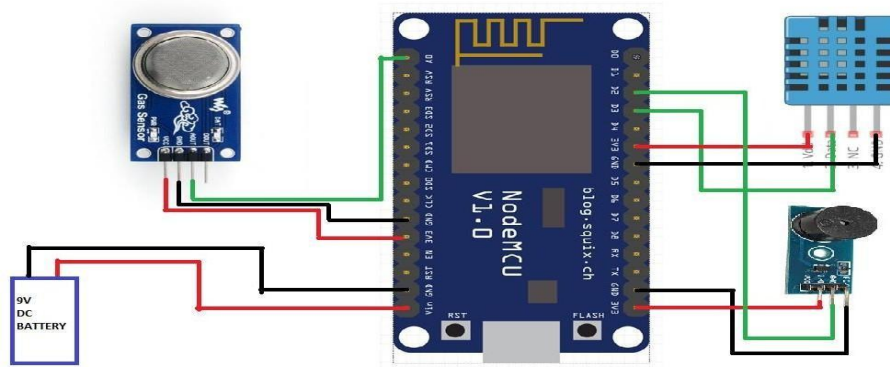

Figure 3: Blynk Server

5 Circuit Diagram:-

Figure 4: schematic diagra

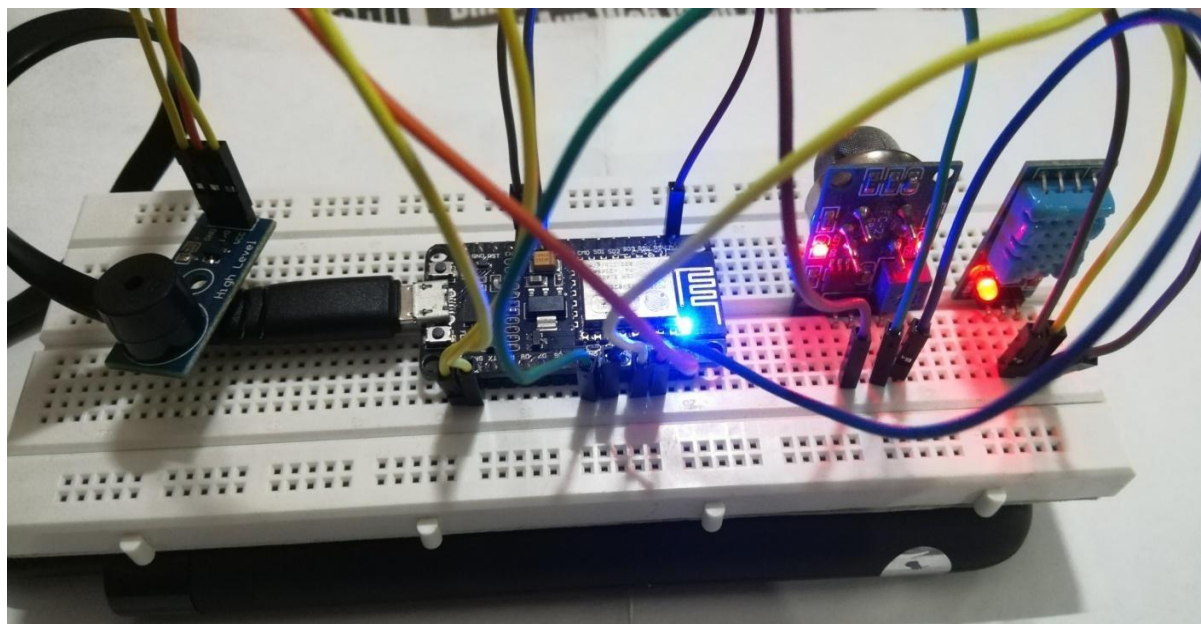**6 Output Results:-**

Figure 5:air quality

6.1 Hardware Kit:-

Figure 6: Hardware kit

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