IOT BASED AIR POLLUTION MONITORING SYSTEM USING ESP8266-12 WITH GOOGLE FIREBASE

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Abstract--In this progress I am progressing to build an IOT air pollution monitoring System within which I will be able to monitor a Air Value done by internet server using net and may activate a alarm once the air value goes down on the far side an exact level, means that once there square measure enough quality of harmful gases measure within the air like co2, smoke, alcohol, benzene, NH3, temperature and wetness. it'll show the air value in PPM in web-page so I will be monitoring it terribly simply. During this IOT project, will be monitoring the pollution level from anyplace using your pc or mobile. I will install this method anyplace and accurate data from devices using internet application using HTTP Protocol. Keywords- air quality observation system, IOT air value check, air quantity checking paper

1. INTRODUCTION
The causes of pollution measure carbonic acid gas, monoxide gas, pollutant, Lead, Ammonia, Particulate Matter, Ground Level gas. The Internet of things permits objects to be detected or in dominant. Things, in the IoT, refers to create of devices like heart observance implants, vehicles with intrinsic sensors, etc. Development of pollution observance system will facilitate to control and live pollution connected parameters. Variety of the ways that to controls pollution parameters measure. we have a tendency to measure reaching to implement pollution detection in vehicles is pollution is high or low owing to combustion of fuel in vehicle. I have a tendency to measure reaching to build it up and implement it using Node MCU and different elements. this methodology is turning into more and more important in pollution detection in vehicles. The Vehicles end up carbonic acid gas (CO2), monoxide gas (CO). I have a tendency to activity pattern electronic text Transfer protocol (HTTP)for act and transferring data and to boot assures that data is not manipulated and one hundred pc transmission of knowledge. For storing details of all vehicles IoT cloud is using

2. PROJECT DESCRIPTION
A. Proposed system:
The system to observe the air of setting using microcontroller, IOT Technology is projected to boost quality of the air. With the using of IOT technology enhances the method of watching numerous aspects of setting like air quality watching issue projected. Here, using the MQ135 it provides the sense of various style of dangerous gas and DHT11 it provides the Temperature and wetness vary and small controller is that the heart of this project. That management the whole method.
B. Origin of the proposal
India being the fourth largest electrode of greenhouse gases little surroundings makes its time to create peoples attentive to matters. Gas sensing and observation refers to the method of ceaselessly pursuit the a in concentration of various air part.

C. Statement of the problem
Growing urbanization and no of business cities build it a demand to possess a detailed concern of the surroundings. exhausting to stay observation unendingly bound sites like industries, busy traffic signals, villages liable to wearing away & high ammonia concentration etc.

3. REQUIREMENTS
A. Hardware

- Gas detector
In MQ135 gas sensing element, SnO2 is present, which is a sensitive material with lower conduction in the clean air. When the target flammable gas exists, the sensors conduction will increase by raising the gas concentration. MQ135 gas sensing element has high quality of Ammonia, and Benzes steam. It is used as a toxoid gas detection device, which applies to ammonia, aromatics, Sulphur, benzoyl vapour.

![Fig.1: Gas Detector](image)

- Temperature-Humidity Sensor User Manual
DHT11 Digital Temperature & Humidity Sensor is a temperature-humidity compound sensor with calibrated output. The sensor includes two sensing component. Each DHT11 sensor is calibrates an extremely accurate humidity-calibration chamber. The calibration coefficients are stored in the form of programs, and during the internal signal detection process of the sensor the calibration coefficients are called. Easy and fast system integration is provided by the single-wire.

![Fig.2: Temperature-Humidity Sensor User Manual](image)
Features

Sensor DHT11 (Temperature sensor)

Operating voltage 3.3V-5.5V

Humidity measuring range 20%-95% (0℃-50℃)

Humidity measuring error ±5%

Temperature measuring range 0℃-50℃

Temperature measuring error ±2℃

Dimensions 29.0mm*18.0mm

Fixing hole size 2.0mm

Node mcu

Microcontrollers have small internal memory which is not enough to save sensors generated data for long time, either you have to use some external memory device or can save the data on some cloud using internet.

Fig.3: Node MCU
B. SOFTWARE REQUIREMENT

Operating System : Windows
Domain : Internet of Things
IDE : Arduino
Language : Embedded C, HTML, CSS, Java script
IoT Protocol : HTTP Protocol

- **Arduino IDE**
  It is a software program runs on the PC for embedded micro-controller design.

- **Embedded C Programming**
  It is a language extension of C Programming which was developed to address the common issues between C extensions for different embedded systems.

- **Google firebase**
  It helps the developers to build real-time applications for IOT, which is one of the mobile platform by sending messages and notifications. It is also known as GCM.

- **HTML**
  1. HTML stands for Hyper Text mark-up language.
  2. HTML is a structure of web content mistreatment mark-up.
  3. HTML is an area of building blocks with mark-up language pages.
  4. HTML parts area unit delineate by tags.

- **CSS**
  CSS is a language that describes the design of associate hypertext mark-up language document. CSS describes however hypertext mark-up language parts ought to be displayed.

- **JavaScript**
  JavaScript is that the artificial language of hypertext mark-up language and therefore the internet.

- **HTTP**
  Monitoring the board over net, a webpage is meant that uses JavaScript to urge information from the board mistreatment HTTP POST technique. The webpage identifies the board by a tool ID associated connects to the Particle's Cloud Service through an access token.
4. RELATED WORK

IoT- primarily based pollution watching and prognostication System: This paper [1] introduces IoT with environmental protection and it puts forward a form of pollution watching and prognostication system.

Wireless device network for period pollution monitoring this paper [2] presents the system which consists of many distributed watching stations that communicates wirelessly with a back-end server victimisation machine-to-machine (M2M) communication.

Pollution watching victimisation wireless device network: the purpose of this paper [3] is to develop an occasional price multisensory node for pollution

The Urban pollution watching system with prognostication Models this paper [4] presents the pollution watching System and its prognostication module.

The Economical knowledge Gathering associate degree Estimation for Metropolitan Air Quality watching by victimisation transport device Networks This paper [5] specializes in a transport device network (VSN) to watch cities air quality and develops an economical knowledge gathering and estimation (EDGE) mechanism on VSN.

The Air quality watching in urban environments, the pollution is an associate degree environmental and a social drawback, because [6] it results an adverse effects on human health, ecosystems and climate.

The [7] has an occasional price geo-referenced air-pollution measuring system is used as early warning tool: the full system is Connected to an inexpensive board with inherent Wi-Fi permitting to send the info to the IoT cloud in period victimisation MQTT protocol, associate degree the georeferenced knowledge may be printed on an open access platform using IOT.

In this paper [8] watching vehicles and pollution on road victimisation transport cloud setting the paper focuses on the transport cloud environments may be the long run technological dynamical model that gives economically attainable solutions by victimisation sensible transport networks with automatic traffic condition info, self-vehicle management on road associate degree develop opinion systems to stop an accident further as analysis of quantity of deadly gases emitted from a vehicle on a road

The paper [9] proposes, 2 number applied mathematics formulations supported real pollutants dispersion modelling to traumatize the minimum price WSN preparation for pollution watching.

5. CONCLUSION

The research presents to observe the toxicity within the air atmosphere is meant victimization Node MCU, IoT technology is enforced to regulate the air quality. By victimization IoT technology the method of observation the toxicity of air and dominant the assorted gases within the atmosphere is projected during this paper. the employment of MQ135 sensing element senses varied venturous gases and Node MCU is that the heart of this application, that controls the entire method. Wi-Fi module controls all the method to the web and monitor is employed for displaying all the net pages over the web. I may use two or more sensor in future

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