

AIR QUALITY MONITOR – A REVIEW

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Abstract- The atmosphere is a complex natural gaseous system that is essential to support life on earth. But the pollution level is gradually increasing day by day. Air pollution is the significant risk factor for a number of pollution related diseases and health condition including respiratory infections, heart diseases COPD, and many more. It has caused many serious problems including climate change, loss of biodiversity, and change in hydrological systems, acid rain, and stress on system of food production. Therefore to understand the quality of the air by sensing type of the dust particle we developed this application for common people so that they can also get proper information about the air quality. It will also provide the information about the temperature and humidity.

Keywords- Dust sensor, Aurduino mini pro, ESP8266, DHT11, Android.

I. INTRODUCTION

The air pollution level around the developed and developing countries is increasing due to various factors like industries, automation and the most important factor is destroying the trees for developing the infrastructure and the vehicles. So it is necessary to understand and detect the problems.

Air pollution has raised great concern over the past few decades due to the increasing expansion of industries. Some of the chemical pollutants in the air can increase the occurrence of diseases such as lung cancer and many more. The human health effects of poor air quality is for reaching, but principally affect the body's respiratory system and cardiovascular system. The common person doesn't get idea about the air and dust around us in the environment. Therefore to understand the quality of the air by sensing the type of the dust particles we developed this application for the common people so they can also get the proper information about the air quality. This application will provide the exact detail about the pollution conditions in the environment and works on that pollution for further processing.

The main aim of our project is to understand and sense the dust particle over the particular region and loading it on the cloud so that developmental measures can be applied globally on it. The sensor will understand the quality of the air by sensing the dust particle. In the past few years there is so automation increased and so it is necessary to understand and detect the problem. Since the hazard gases are spread over the very large scale region and causing huge irreparable damage and that's why there is growing the demand for the air pollution monitoring.

The project module contains two parts which are segmented into hardware and software. Arduino mini pro and ESP8266 together is capable enough to take an analog input from the dust sensor and upload on the cloud via Wi-Fi device. GLCD is used to display everything. GLCD will be connected to controlling device. Now the fan is present there so as to pass the air and give it to the sensor. The Android app can be easily made and graphs can be easily made by json parsing in Android studio.

This project is the sub module of an ongoing international project which will be installing over 1000 units of the system all across the globe to identify the problem and collect the data. Most of the data submitted to the government is not perfect or sometimes it may fake. Thus it would lead to vast inconvenience for the cooperators. Therefore by using this application the updates will be always

available for all over people in the world. And the government also will get the complete information about the condition of the pollution in their particular place and they can take correct decision for the common public.

The pollution level index in the environment is gradually increasing due to expansion of the industries. It has caused global warming and that's why biodiversity is losses and stress on the system of food production is increasing. Therefore by using this application we can help to the common person who needs to know about the climate change and the environment pollution.

II. LITERATURE SURVEY

Environmental Monitoring System: Review

Nihal Kulratna and B. H. Sudantha presented environmental air pollution monitoring system in 2008. The system based on the IEEE 1451 standard. In this paper STIM smart transducer interface module was developed which consist of microcontroller and group of various sensors like CO₂, O₃, NO₂, CO. This also used personal computer PC for graphical representation. STIM connected to the PC via transducer independent interface which uses IEEE 1451 standard.

In the year of 2010 A. R. Ali-Ali, Imran Zualkernan and fadi Aloul mobile GPRS sensor for the pollution monitoring. This included data acquisition unit, GPRS module and pollution server. In this DAQ unit, GPRS and GPS were connected to the microcontroller via RS-232 Interface and finally gathered data were sending to the pollution server.

Raja Vara Prasad et al. In 2011 proposed a real time wireless pollution monitoring. This system was based on the multihop data aggregation algorithm. Calibrated gas sensors were interfaced to wireless sensor motes, in that Libelium WASP mote was used which consist of processing unit and communication unit. All gas sensors were connected to sensor board on rotational basis. The collected data were sending to base station. Multihop data aggregation algorithm was used to increase a monitoring range.

Jen-Hao Liu et al. introduced micro-scale air quality monitoring system for urban areas in 2012. This system monitors the concentration of carbon monoxide co caused by heavy vehicles emission. Sensor nodes were deployed in highly populated areas. System was integrated with the GSM for data transmission. Gateway collected the data from all sensor nodes and sends to control centre by GSM network.

Anuj Kumar et al. in 2013 conducted a review on environmental monitoring system. The review discussed different techniques and various hardware used in the environment monitoring system. It also considered the parameters like low power consumption, reliability, and signal to noise ratio and RF interference.

Abdullah Kadri et al. in 2013 presented real time air pollution monitoring based on machine to machine communication. The system was implemented with various monitoring station which consist of different gaseous and metrological sensors. Each monitoring station communicates with the backend server through M2M communication which uses GPRS network.

The present existing system has multiple drawbacks which we want to overcome through the current project. Then following points are factors represent the current system:

Infrastructure- Most of the sensors which controls the data in the India is government base. Where is a dedicated building or infrastructure and through that tower, the data is collected. So there are many places in India which still don't have access to these sensor data.

Sensors in market- There are currently a lot of sensors modules or the devices which gets imported in India from other countries. Basically these sensors are very much costly because they are imported from other countries. Also the technical issues are very hard to solve which again makes it hard to purchase.

Satellites- Satellites are used with combination of on ground sensors that collects the data and manually get uploaded on the cloud. The procedure is tedious and long which makes the overall process very much long. Remote sensing via satellite and spacecraft for the geographical mapping prediction of agriculture craft, prediction weather and flood control.

Weather and Monitoring vehicles- There are vehicles which monitor the air quality on the run. These type of vehicles travel around other cities and then collect data of the specifics places. These vehicles are excellent in monitoring the weather conditions but they may be very expensive.

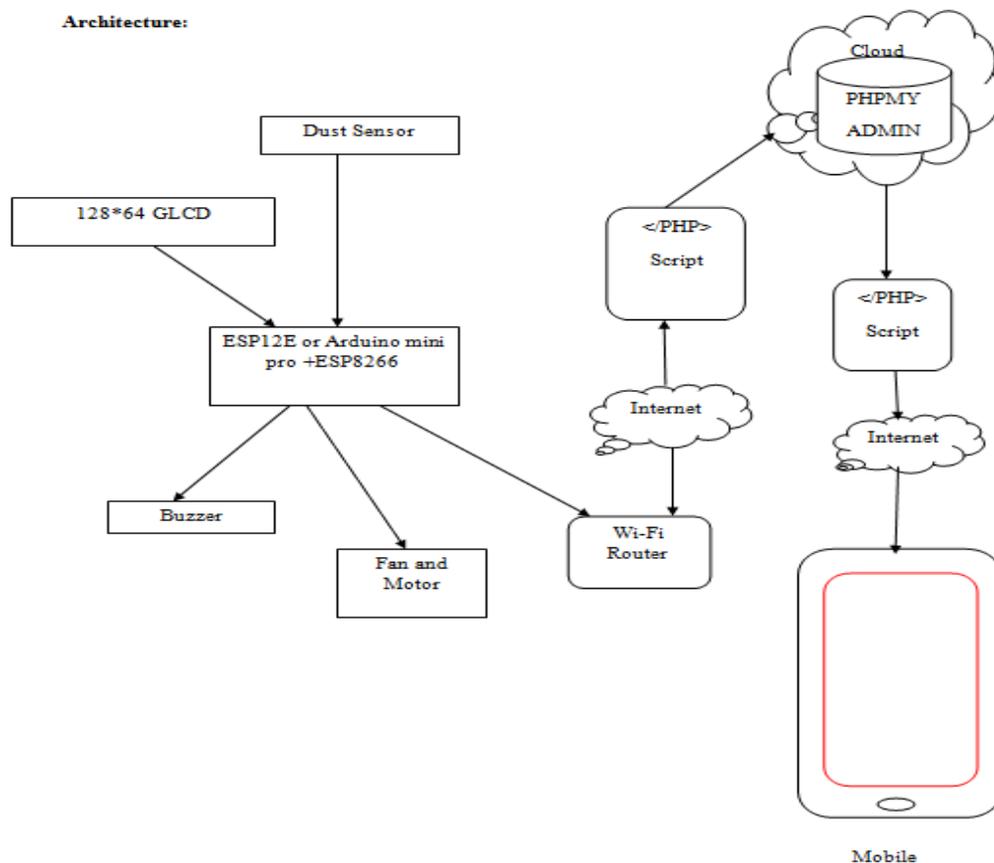
III. PROPOSED SYSTEM

The proposed system uses very cheap sensor module but extremely powerful. The modules will be around 80% less than current present module in the market will make it accessible for the mid average families. In this generation every person is working on the internet or they uses multiple application with internet so this will be easily affordable by the users and they can easily handle this application.

The sensor will detect the air quality and upload it on the cloud for everyone. So the person regardless of having the device or not can see the accurate data of the air quality in the user home, which will help realize the problem and take necessary measures to deal with the problem.

Right now in the current system we are using an arduino mini pro with esp8266 Wi-Fi module, which will be connected to a dust sensor. This system will be connected to a cloud where the data will be uploaded. There will be an android app and web app which will be accessible in the smart phones and computers through which the user can see the data of not only their environment but also others too. The ESP12E is the microcontroller based Wi-Fi module which is capable of taking analog input from the dust sensor and upload it on the cloud, here we are using Arduino mini pro and ESP8266 together for the same task.

Architecture:



IV. CONCLUSION

Hence we are developing this application for the welfare of every common person so that they can know about the air quality around them and they can sense the pollution or dust particle in the environment. This application will provide the exact information about the pollution condition in the environment like temperature, humidity and dust particles. Therefore this project will sense the dust particles over a particular region and loading it on cloud so that developmental measures can be applied globally on it.

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