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Noise Detector with Automatic Recording System using IoT

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Abstract: ***Nowadays noise pollution is a growing problem in modern cities, thanks to rapid population growth, urbanization and new technologies. Moreover, at times, a noisy neighbor or co-worker can drive you crazy and affect your well-being. Talking loudly is an annoying habit in an office environment. Having a loud coworker can distract us from our work and harm our productivity. So to solve this problem, we are building this prototype and named as A Noise Detector With Automatic Recording System. This device notifies users whenever it detects loud noise, as well as it automatically records the sound and saves this recorded sound in a file. This device is connected to our mobile phone via bluetooth when the device detects the sound the Bluetooth app automatically starts recording that sound and save this file in our mobile. This Noise Detector System can be used in library, office and classroom environments to identify noisy people so that necessary action can be taken against them.***

Keywords: IoT, Noise Detector, Arduino, Automatic recording system

I. INTRODUCTION

Noise pollution is a growing problem in modern cities, thanks to rapid population growth, urban station and new technologies. Moreover, at times a noisy neighbour or co-worker can drive you crazy and affect your well-being. This device notifies us whenever it detects loud conversation (the sound level above 120dB to 140dB) and it also records the conversation and saves in a file. These devices are used in silent zones like hospitals, libraries, labs, and also in schools and colleges to maintain decorum. This helps us to maintain silence and also to identify noisy people so that necessary action can be against them. To control and monitor of different activities focused by present innovations in technology.

To reach the human needs these are increasingly emerging. Most of this technology is focused on efficient monitoring and controlling different activities. To monitor and assess the conditions in case of exceeding the prescribed level of parameters (e.g., noise, CO and radiation levels) an efficient environmental monitoring system is needed. In an environment when an object equipped with sensor devices, then in this case microcontroller and various software applications becomes a self-defending Self- monitoring and self-controlling environment and it is also called as smart environment. Global Emissions from Natural & Man Made Sources.

The level of pollution in air can be measured by measuring the pollutants such as humidity level, temperature level, dust level, CO level, smoke level etc. present in the air of that area. Here we propose an air quality pollution monitoring system that allows us to monitor and check live air quality in a particular area through 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 to control the issue. Here we propose an air quality pollution monitoring system that allows us to monitor and check live air quality in particular areas through IoT. To sense presence of harmful gases/compounds in the air and constantly transmit this data to microcontroller; Air sensors are used by the system.

II. LITERATURE REVIEW

The air and sound pollution monitoring system is absolutely important for detecting wide range of gases, also sensors have long life time, easily available, less cost, easy to handle and are compact. Quality of air can be checked indoor as well as outdoor. This system has simple drive circuit, works on real time and has visual output. The main objective of this paper is to ensure that the air and sound pollution is monitored and kept in control by taking measure accordingly. The proposed paper have certain limitations regarding humidity which should be less than ninety-five percent and exact measurement of contaminating gases cannot be detected in ppm. This paper can be used for monitoring pollution level and also to prevent excess of pollution which can cause huge problem in future. The cost effective IOT technology is used. Hence air and sound pollution is monitored by using this technology. The motive of making a smart city can be fulfilled by using technology, thus making the life better and also enhancing the quality of services, therefore meeting every individual's needs.

With modern technology in fields of information and communication, it has become easy to interact with the authorized people of city to tell them where about of the area or city, how well the city is developing and how to make it possible to achieve a better life quality. In this system, an application was created to make one more step in the fulfillment of the goal. An area is analyzed for evaluating how much pollution is affecting the area.

The components of gases and their amounts are calculated and checked. If the amount is higher than normal then the officials are reported about it. After that the people are made to clear the area and taken to a safe place. The combined network architecture and the interconnecting mechanisms for the accurate estimation of parameters by sensors is being explained and delivery of data through internet is presented. The Automatic Air & Sound management system is a step forward to contribute a solution to the biggest threat. The air & sound monitoring system overcomes the problem of the highly-polluted areas which is a major issue. It supports the new technology and effectively supports the healthy life concept. This system has features for the people to monitor the amount of pollution on their mobile phones using the application.

So, it becomes very reliable and efficient for the Municipal officials along with the Civilians to monitor environment. Letting civilians also involved in this process adds an extra value to it. As civilians are now equally aware and curious about their environment, this concept of IOT is beneficial for the welfare of the society. And it is implemented using the latest technology. This IOT based air and noise pollution monitoring device is a great step towards a healthy livelihood. With the help of this device not only the municipal authorities but even the common people can participate in the process of controlling pollution and ensure safe environment. These automatic devices, once installed are capable of continuously tracking the pollution level and analyze the detected information.

The most highlighting feature of this device is that the output is represented in digital as well as analog format with the help of a simple mobile application which is usable on all android devices like smart phones, tablets, PDA's etc. The device itself is very eco-friendly and does not harm the environment in any way. Moreover, it is based on one of the modern technology and also inexpensive as compared to other technologies developed so far and can be installed anywhere. For creating the system, first author did the research based on the system about IOT and various sensors. Sensors of air and sound based on availability and economical price were selected.

For the interaction of internet with the system using a Wi-Fi module which is connected to the microcontroller through the serial port. So, the measured data is sent from the module to any location with its range from the data can be fetched using a laptop /mobile.

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To implement this need to deploy the sensor devices in the environment for collecting the data and analysis. By deploying sensor devices in the environment, system can bring the environment into real life i.e. it can interact with other objects through the network.

Then the collected data and analysis results will be available to the end user through the Wi-Fi. The data can be an important source when addressing the issue of the impacts of motorcycles at idles (e.g. waiting for a green light) on air quality.

III.OBJECTIVE

The main objective of this project is:

A. To detect air quality and keep it under control for a better future and healthy living for all.
B. To save precious lives of people and property about it.
C. To automatically capture only the noise from the original source.
D. To promote noise assessment and control part of environmental health programs.
E. To develop criteria for maximum safe noise exposure levels.

It would be possible to automatically capture only the noise from the original source, by adding intelligence and human hearing like decision algorithms to the sensor. This would free the huge amount of human resources needed to validate the noise data and improve the representativeness of the result in the environmental noise measurement. And implementation of a noise classification algorithm in a sensor will be introduced.

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IV. PROPOSED MODEL

Proposed project acts as a noise controller device which sense noise around and if it goes above the threshold marked it will start beaping a small buzzer sound to notify the surrounding that noise is getting above the threshold and also for further reference it will start recording the sound until it gets lower than the threshold value. For this we have used a sound sensor module which consists of an in-built capacitive microphone which will be used to convert the vibration into the current or voltage signal. And APIR module (ISD 1820) will record and store the sound for further reference. Also this recording will be sent to the database and can be played from the app

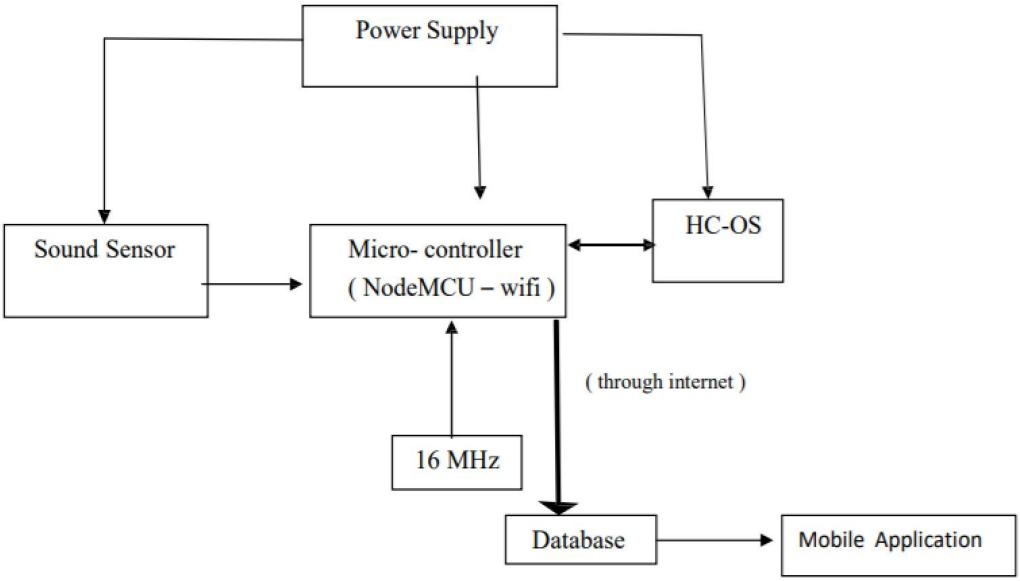
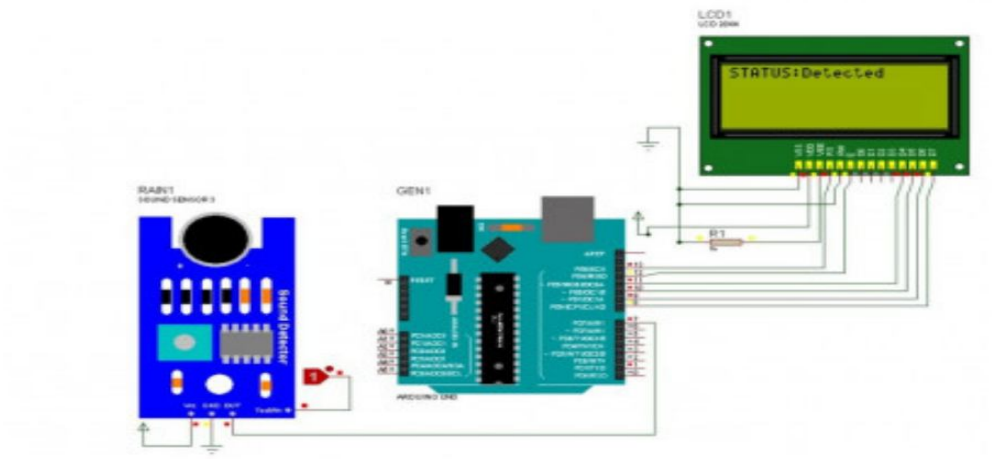


Fig:- Noise detector with automatic recording system using IoT

V. WORKING

Once the circuit is completed and connections is done , our project is then ready for testing and working . For testing purpose we need to make some loud noise which will be detected by the sound sensor module and then when it reaches above the threshold it will start buzzing a small sound with the help of buzzer simultaneously start recording the noise until the sound comes back below the threshold value.



VI. ADVANTAGES

A. IoT based noise pollution monitoring system is a machine communication system so that data to be recorded will have great accuracy.
B. Also devices are wirelessly connected so automation and controlling of it becomes an easy task for a person.
C. It can record data without any human interaction. This system saves good amount of time because once it is installed, it works automatically.
D. We just have to read the data and analyze it. Most of the current noise pollution recording devices are costly compared to the IoT based devices, they are cheap so they will save good amount of money also.

VII. DISADVANTAGES

A. As this devices are interconnected via internet there are possibilities that they can get hacked or monitored by malicious users or can be an issue using this type of devices.
B. As with all complex systems, there are more opportunities of failure which is complexity.
C. With all of this data being transmitted, the risk of losing privacy increases.
D. There are notorious hacker changes your prescription. As a result, safety is ultimately in the hands of the consumer to verify any all automation.

VIII. CONCLUSIONS

Thus the model 2 is efficient noise detection with an automatic recording system that can be used in schools and offices to identify noisy peoples.To implement this need to deploy the sensor devices in the environment for collecting the data and analysis. By deploying sensor devices in the environment, we can bring the environment into real life i.e. it can interact with other objects through the network. Then the collected data and analysis results will be available to the end user through the Wi-Fi. The smart way to monitor environment and an efficient, low cost embedded system is presented with different models in this paper. In the proposed architecture functions of different modules were discussed. The noise and air pollution monitoring system with Internet of Things (IoT) concept experimentally tested for monitoring two parameters. It also sent the sensor parameters to the cloud (Google Spread Sheets). This data will be helpful for future analysis and it can be easily shared to other end users.

IX. ACKNOWLEDGMENT

After a successful connection and creating an app, your project is ready for testing by making some loud noise.Whenever the sound level crosses the threshold limit.Buzzer will make a buzz sound to notify about it. Simultaneously apps tarts recording until the sound limit settles below the threshold limit.

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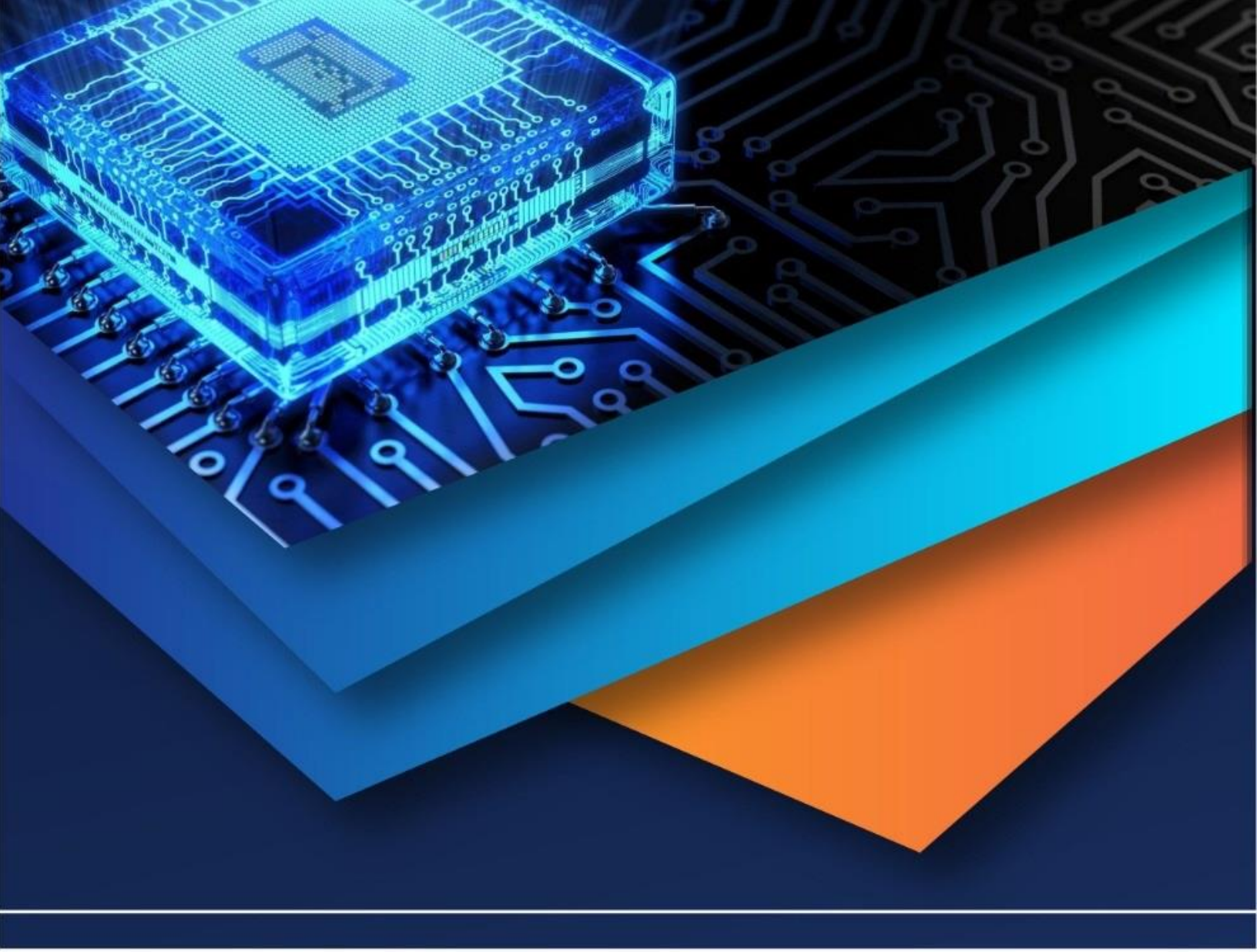

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