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Air and Sound Pollution Monitoring System for Smart Cities

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Abstract: ***Air and Sound Pollution is increasing Rapidely. To control it its monitoring is necessary .To overcome this issue, we are introducing a system through which the intensity of sound and the presence of the harmful gases in the surroundings can be detected. The authorities and people belonging to the area can access the air And sound pollution monitoring system device. This device will show the updates of the pollution level of the area on free server like IoT Gecko . This system works on the principles of IoT which is a rising technology based on the combination of electronics and computer science. The sensors used in this system will detect majority of air polluting gases and also level of sound pollution. Additionally this system also has temperature sensor and humidity sensor. The concept of IoT helps to access data from various locations and save it in database so that we don't need to be present in that area.***

Keywords: air pollution, sound pollution, IoT, Sensors,

I. INTRODUCTION

In Entire world, increase in the population and rapid growth in industrialization has caused serious environmental degradation. There are different types of pollution air ,noise,water and land pollution. Introduction of air pollution and sound pollution monitoring system will be beneficial to monitor and control different pollution related parameters.[2]

A smart city should be able to monitor pollution level of the developed areas in effective and efficient way. Pollution level can be measured by many parameters: dust particle, light intensity ,density in the air, humidity and the level of sound noise[13].

In this genration the technologies are advancing rapidly. Few years back checking the pollution level in a particular area was a very difficult task which was not very efficient also. With the increase in the pollution level and introduction of new advance technology various new methods were introduced to keep an eye on the increase in pollution more efficiently. Internet of things is one of the advanced works that has been done in this path. The sudden rise in use of internet and the interaction of human with machine gave rise to Internet Of Things. The IoT is so successful because of its efficiency and it makes it a feasible technology at low cost.

The main objective of Air & Sound pollution Monitoring System for smart cities is that the Air and sound pollution is a growing issue these days it is recommended to monitor air quality and sound level and keep it under control for a good future and healthy living for all. Here we are introducing an air quality as well as sound pollution monitoring system that will allow us to continously monitor and check real time air quality as well as sound pollution in the sorrounding area through IoT. [10]

II. LITERATURE REVIEW

The Aim of making a smart city can be fulfilled by using technologies, thus making the human life better and also enhancing the quality of services, therefore meeting every individual's needs. With modern technologies in fields of information and communication, it has become very easy to interact with the authorized people of city. [3]

The purpose behind this paper is to ensure that the air and sound pollution in the sorrounding is continuously monitored and kept in control by taking preventive actions accordingly. In this research, a real time monitoring of Air quality is checked in real environment. Then the simulated results are updated on free web server As the technology increase, the degree of automation (minimizing the man power) in the almost all sectors are also increases.

In this system, all the parameters which are being measured are uploaded on free server (here we are using Iot Gecko). An area is selected and analyzed for evaluating how much pollution is affecting the area. The components of gases and their amounts are calculated and checked. If the amount of toxic gases present is higher than normal then the local officials are informed about that. After that the local officials can take corrective measures.

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Various methods were used in the past to monitor the pollution and some are described in this section. The very First is Smart Environment Monitoring using Wireless sensor networks in which the main focus was on the developing an environment free of pollution by making it smart. Wireless sensors are fitted all over the city ,in public transports, in various industries and also in house. By monitoring all the sensor networks, all the environmental happenings can be gathered as a streaming database to analyze the environmental position.

Second technique is Toward a Green campus with the internet of things. It is an implementation of idea to save energy through preety good management of computer and air conditioner. This technique is based on the concept of internet of things.

III. PROPOSED SYSTEM

This system uses air sensor to check the presence of harmful and hazardous gases/ compounds in the air and also this system uses the sound sensor to keep measuring sound level in the surroundings.

Additionally it also uses Temperature sensor to measure the temperature. It also has Humidity Sensor to observe the amount of humidity present in the atmosphere. Cooling fan is also provided so that whenever temperature rises above preset value the fan will turn on to cool the soorrounding. MQ2 is the air sensor which is used to collect air pollutants. A sound sensor module which is mic is used to detect sound. These sensors interact with PIC18F4520 &GSM Module which processes this data and then transmit it over the free server. With this system not only the authorities but also the localized people can check the transmitted data through the server and that too without spending single charges. the people can act against the increasing pollution on their level.

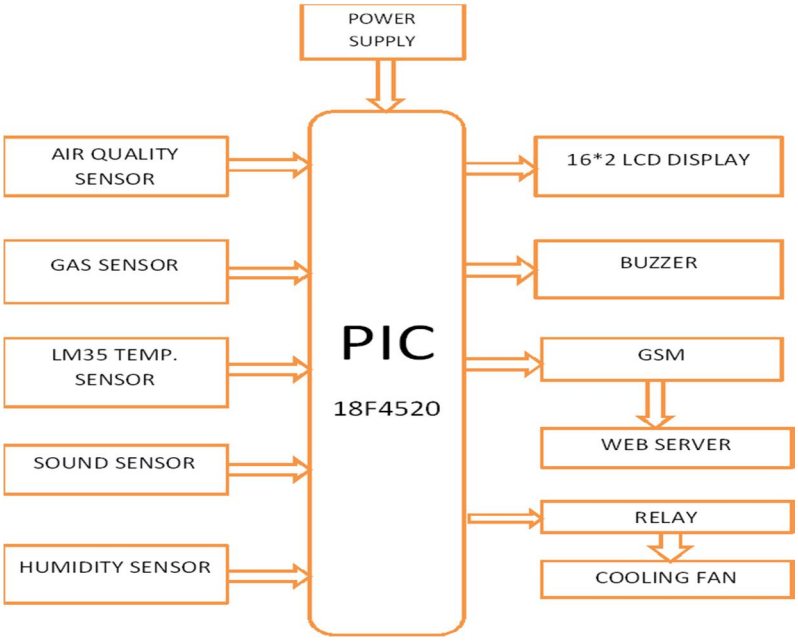

Fig 1.Block Diagram Of System

IV. WORKING

The Air and Sound Pollution Monitoring System consists of the PIC 18F4520 microcontroller. PIC microcontroller is also known as the Brain of the device as everything in this system is controlled by the PIC. Initially, the PIC is provided with a 5 V DC supply. Now the Air, Sound, Temp & Humidity Sensors are Connected to the different pins of the PIC microcontroller. These sensors provide the data to the PIC through GSM module that is displayed on the LCD display continuously. if the air pollution exceeds beyond the set limit (defined by the programmer)Then the buzzer will continuously beep.

When Sound intensity exceeds specific limit LED light will turned on. And similarly when the temperature Exceeds predefined value the Cooling Fan will be turned on to cool the air. Now the data which is retrieved from air and sound sensor will be provided to the GSM module which is connected to PIC microcontroller .This GSM module will then send this data to the server accessible to all the users and accordingly the local people can take actions on their part.

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V. RESULTS

The Results Of This System are Displayed on Free Server (Iot Gecko) like shown below

VI. CONCLUSION

This air and sound pollution monitoring device is a positive 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 detecting & controlling pollution and ensure safe environment. This fully automatic device, once installed at various places is capable of continuously tracking the pollution level and analyse 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 server. This device is very eco-friendly and does not harm the environment in any way..

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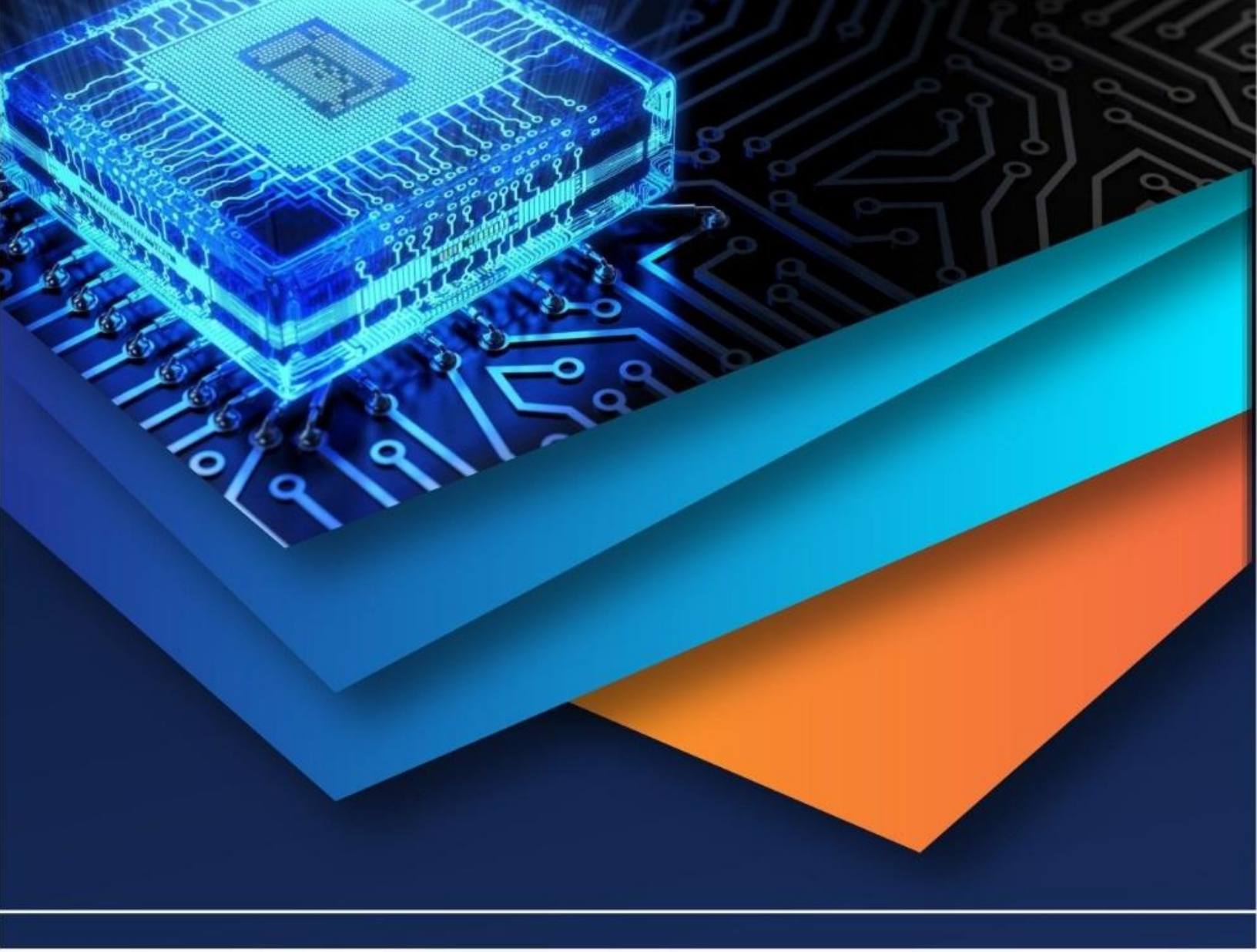

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