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IOT Based Noise Pollution Monitoring

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Abstract - **The rapid growth of industrial plans and environmental issues like climate change, noise pollution and malfunctioning has greatly influenced the need for a robust, easily adaptable, smart and very cheap monitoring systems. This technology is focused on proficiently monitoring, environmental monitoring of different activities. The main motto is to assess the condition in case of exceeding the prescribed level of parameter (e.g.: CO, noise and radiations) potential environmental impacts, public health and safe guarding the contaminant releases. When environment acts like a self protecting and self monitoring environment then it is known as smart monitoring system. This is mainly targeting on smart environment system. When some event occurs the alarm or led alerts automatically and this effects the living things present around and also changes the behavioral and operational characteristics. In SPE the sensors are placed in the area of interest to sense the data and the gathered data is stored on cloud. The aim of the project is to design and implement an environment system in which noise parameters are monitored remotely using internet. This proposed project can be further used for monitoring the cities and industrial zones for noise pollution monitoring in the world. The main motto is to protect the public health from the pollution and provide an effective and low cost solution for continues noise pollution monitoring.**

Keywords: Sensors, Smart environment, Cloud, Noise pollution.

I INTRODUCTION:

The rapid growth of industrial plans and environmental issues like climate change, noise pollution and malfunctioning has greatly influenced the need for a robust, easily adaptable, smart and very cheap monitoring systems. This technology is focused on proficiently monitoring, environmental monitoring and controlling different activities. The main motto is to assess the condition in case of exceeding the prescribed level of parameter (e.g.: CO, noise and radiations) potential environmental impacts, public health and safe guarding the contaminant releases. When environment acts like a self protecting and self monitoring environment then it is known as smart monitoring system. This is mainly targeting on smart environment system. When some event occurs the alarm or led alerts automatically and this effects the living things present around and also changes the behavioral and operational characteristics. In Spatial process estimation the sensors are placed in the area of interest to sense the data and the gathered data is stored on cloud. The aim of the project is to design and implement an environment system in which noise parameters are controlled and monitored remotely using internet.

Public authorities are concerned about environmental and human risks related to pollution, especially with gas emissions But another kind of pollution also dramatically affects cities and inhabitants' health. Noise pollution is increasing in urban areas, mainly caused by the transport impact, civil works or the industry. In fact, the World Health Organization (WHO) has stated that noise pollution is the second cause of illness for environmental reasons, after air pollution. The report explains how harmful for health is traffic noise that is currently affecting one in five Westerners that are regularly exposed to sound levels at night.

II EXISTING SYSTEM

In today's world many pollution monitoring systems are designed by considering different environmental parameters. Existing system model is presented in figure uses Zigbee based wireless sensor networks to monitor physical and environmental conditions with thousands of application in different fields. The sensor nodes directly communicated with the moving nodes deployed on the object of interest which avoided the use of complex routing algorithm but local computations are very minimal.

A tag has an identification (ID) number and a memory that stores additional data such as manufacturer, product type, and environmental factors such as temperature, humidity, etc.. The reader is able to read and/or write data to tags via wireless transmissions. In a typical RFID application, tags are attached or embedded into objects that are in need of identification or tracking. A Wireless Sensor Network consists of many inexpensive wireless sensors, which are capable of collecting, storing, processing environmental

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information, and communicating with neighboring nodes. In the past, sensors are connected by wire lines. The access method of WSN gateway node is convenient because data can be received from a WSN via the gateway at any time and any place. The gateway acts as the network coordinator in charge of node authentication, message buffering where you can collect, process, analyze, and present your measurement data. Wireless sensor network management model consists of end device, router, gateway node and management monitoring center.

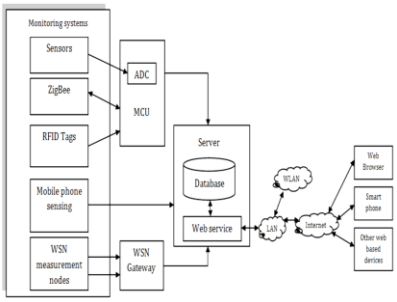

Fig.1.Existing system

III PROPOSED MODEL:

Embedded computing device is proposed for noise pollution monitoring to create smart environment. The proposed system shown is a distributive and scalable environmental monitoring system.Tiered architecture is proposed to discuss on the functions and services of individual modules developed for noise pollution monitoring. This tiered architecture includes 4 tiers that is general environmental parameters to be monitor as tier1, sensor devices as tier 2, sensor data acquisition and decision making as tier 3 and intelligent environment as tier 4. This tiered architecture is shown

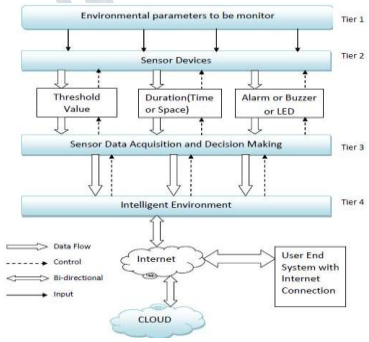

Fig.2.Implemented model

Here, the tier 1 provides the details and functionalities of different regions to be monitored for the noise pollution and its control. Tier 2 discusses the sensors with suitable characteristics, features and how each of these sensors are operated and controlled based on their sensitivity as well as the range of sensing.

Depending on the condition tier 3 will decide on sensing and controlling, like fixing the threshold, periodicity of sensing, timings for alert, messages (alarm), etc. These can be referred as parameter fixing elements which can be controlled explicitly or implicitly based on the contextual requirement. For example, based on the data analysis performed in tier 3 and also from previous experiences the parameter threshold values during critical situations or normal working conditions are determined. Using the physical behavior and also the analytics involved in the respective parameters the different context are specified.

Tier 4 describes that the data is acquired from the sensing system.The sensor data is analyzed based on the threshold and if the environment is detected as hazardous, controlling such surroundings makes our system intelligent. Finally, the information collected is sent to the users through the web server (using mobile device, PC etc) as well as stored in the cloud.

IV IMPLEMENTED MODEL

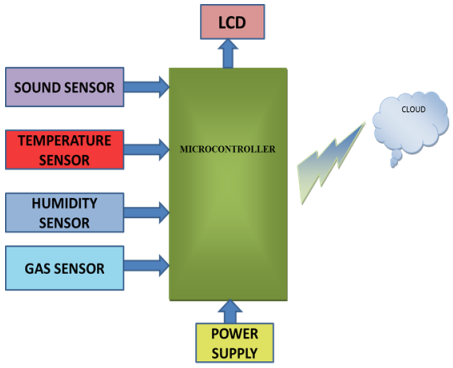

Fig.3. Block diagram

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Sound pollution is a growing issue these days. 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 as well as sound pollution monitoring system that allows us to monitor and check live air quality as well as sound pollution in a particular areas 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 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. 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.

V IOT

Internet of Things or IoT is an architecture that comprises specialized hardware boards, Software systems, web APIs, protocols which together creates a seamless environment which allows smart embedded devices to be connected to internet such that sensory data can be accessed and control system can be triggered over internet.

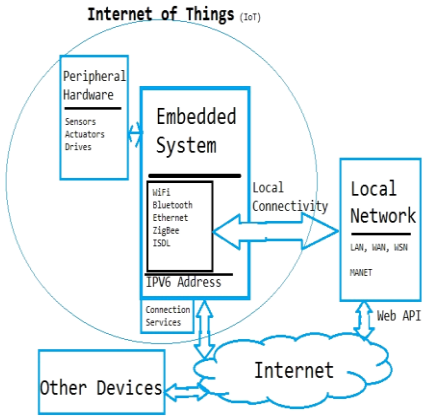


Fig.4internet of things

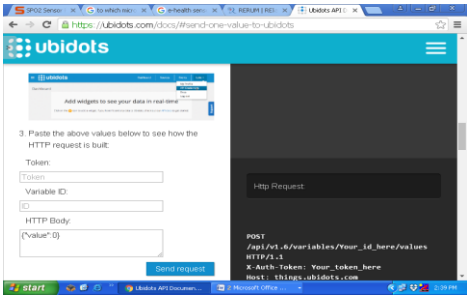
VI Ubidot(IOT Platform):

API REFERENCE: A complete list of the supported API calls, with sample requests and response.

- DEVICE CLIENTS: Firmware examplesand tutorials on how to connect different device to ubidots
- API CLIENTS: API librartes to help you interact with ubidots from your own applications.
- Send one value to ubidot:
- Lets start by sending an HTTP request to the ubidot API to create one value.
- We'll need to tell the API the ID of the variable we want to update, and a security token so that our request can be authenticated:
- Variable ID: This is a identifier of the time series that stores your data.
- Token: A unique key to authenticate your request.

Let's create a sample HTTP request using these two:

1.Click on "API credentials" then copy your authentication_token:



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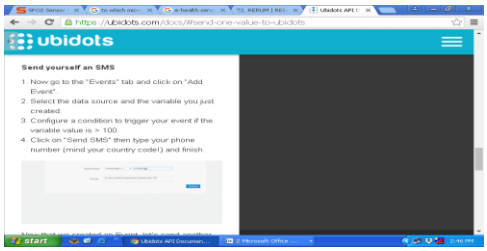
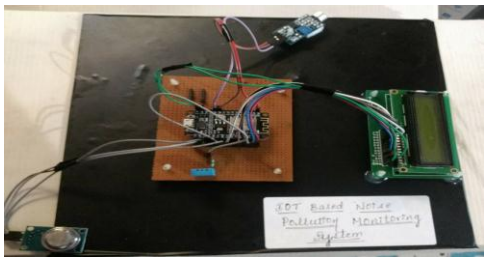


VII PROTOTYPE



VIII OUTCOME

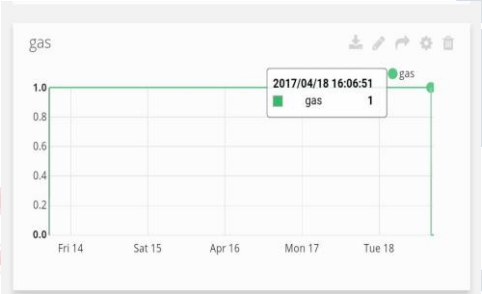


Fig.5.Ubidot-access

IX APPLICATIONS

- This system is very promising to use in various industrial areas where air pollution level is high.
- System can be used in the traffic signal to get the latest updates of the traffic.
- System also used in near the hospitals where pollution (air, noise) & traffic problems are is most harmful to the patients.
- In Weather forecast department, so they can give information about the rainfall and effect of rainfall on traffic in particular area.

X ADVANTAGES

- Due to the use of various sensors it is easy to detect or to measure the noise pollution in the city.
- System is useful to give live dashboards results of any particular area of interest.
- It can be mounted easily at any particular area.
- System is capable of detecting temperature ,humidity, noise and gas continuously.
- Reliable capture of sensor readings from multiple nodes against location in near real-time.

XI OUTCOME

- A low-cost deployment with great possibilities.
- Reliable: capture of sensor readings from multiple

nodes against location in near real-time.

- Efficient cloud-based data gathering platform.
- To provide an effective and low cost solution for continues noise pollution monitoring for protection of the public health From the pollution.

XII CONCLUSION

For smart environmental monitoring devices using IP configured embedded device through Wi-Fi. The concept of smart environmental monitoring along with presenting its different models, applications is addressed in the project. The noise pollution monitoring using IOT framework and integration with the embedded device has been experimentally proven to work satisfactorily by connecting few sensing parameter to it and parameters were successfully controlled remotely through Internet. It also stores the sensor parameters in the cloud in a timely manner. This will help the user to analyze the condition of various parameters in the environment anytime anywhere.

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