A SMART ENVIRONMENTAL MONITORING SYSTEM USING INTERNET OF THINGS

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ABSTRACT

In recent decades, the science and engineering professions have been heavily influenced by their responsibilities to the society. This responsibility has been directed towards the protection of public health and welfare. In devising controls for emission of pollutants, scientists and engineers have developed strategies for monitoring the environmental pollution problems. Environmental monitoring describes the processes and activities that need to take place to monitor the quality of the environment. All monitoring strategies and techniques have reasons and justifications which are often designed to establish the current status of an environment or to establish trends in environmental parameters. In this paper, we have proposed an idea to monitor pollution using IoT Techniques. The extent to which the environment gets affected is noted and corresponding control and prevention practises are implemented. The Higher Officials in that area gets notified about the pollution range and the necessary steps are taken. By controlling the environmental pollution the cities are devoid of health issues and

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I. Introduction

The IoT has a large role to play in future smart cities. The IoT can be used in practically all scenarios for public services by governments. Sensor-enabled devices can help monitor the environmental impact of cities, collect details about sewers, air quality, and garbage. Such devices can also help monitor woods, rivers, lakes, and oceans. Many environmental trends are so complex, that they are difficult to conceptualize.

The Internet of Things (IoT) is a recent communication paradigm that envisions a near future, in which the objects of everyday life will be equipped with microcontrollers, transceivers for digital communication, and suitable protocol

stacks that will make them able to communicate with one another and with the users, becoming an integral part of the Internet.
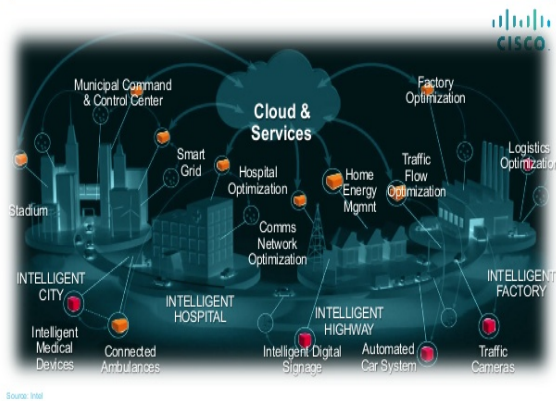
An urban IoT can provide means to monitor the quality of the air in crowded areas, parks, or fitness trails. The realization of such a service requires that air quality and pollution sensors be deployed across the city and that the sensor data be made publicly available to citizens.

II. Existing System

Air quality eggs can be found across Western Europe, America. It also plays a major role in developing countries. This is a community-led air quality sensing network that allows anyone to collect very high resolution readings of NO_2 and CO concentrations outside of their home. Sensor networks are also being deployed in tunnels to monitor air flow, visibility, and a range of gases (CO, CO_2, NO_2, O_2, SH_2 and PM-10). Other sensor networks measure temperature, humidity and similar parameters on highways to qualify them as 'smart roads'.

Due to the vast technological developments in the field of wireless communication technology it has led to the emergence of many Pollution monitoring sensors and wireless networks for monitoring and reporting pollution.

Some of the pollution monitoring sensors is given as follows

Waspmote:

Waspmote along with the gas sensors board allows monitoring the following parameters to determine the quality of air we breathe.

CitiSense:

Researchers at the University of California, San Diego have developed a network of Smartphone-based air pollution monitors that allow individuals to track pollution levels in real time and feed a

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central database of air quality trends citywide throughout the day.

Working

Environmental monitoring

Environmental monitoring applications of the IoT usually use sensors to lend a hand in environmental protection by monitoring air or water quality, atmospheric or soil conditions, and can even include areas like monitoring the movements of wildlife and their habitats. Development of resource constrained devices connected to the Internet also means that other applications such as tsunami or earthquake early warning systems can also be used by emergency services to provide effective aid.

The analysis will be carried out for pollution due to changes in parameters because of,

• Climate (Rain, Temperature, Environment, Dust) change.

 • Population.

 • Industrial wastage.

III. Proposed System

The goal of building a smart city is to improve quality of life by using technology to improve the efficiency of services and meet residents' needs. Information and Communication Technology allows city officials to interact directly with the public to tell what is happening in the city, how the city

is evolving, and how to enable a better quality of life.

A Smart City is one with at least one initiative addressing one or more of the following six characteristics: Smart Governance, Smart People, Smart Living, Smart Mobility, Smart Economy and Smart Environment. We are going to develop an app that is going to bear a hand in this campaign.

Consider an area that is being surveyed for estimating how much the area is affected by pollution. The constituents of air along with its proportion are calculated and if it is higher than normal then the officials are intimated about it. Then the people are evacuated to a safe place.

IV. Implementation and Result Analysis

- Any Smart Phone.
- Sensors.
- Cloud / Big Data.
- Internet of Things.
- Internet connection is also required.
- Any Locality.

Cloud Storage:

Cloud storage is a model of data storage in which the digital data is stored in logical pools, the physical storage spans multiple servers, and the physical environment is usually owned and managed by a hosting company. These cloud storage providers are responsible for keeping the data obtainable and accessible, and the physical environment protected and running.

Big Data in Cloud. The power of **Hadoop** delivered as a secure, automated, elastic service, which can also be fully integrated with existing enterprise data in Oracle Database.

V. Future Work Development

The information's that are collected by the sensors could be used by the authorities to take necessary action such as emergency warning messages and evacuation of people to safe places. Further implementing pollution monitoring systems will help to assess how bad air pollution is from day to day and save the environment from further pollution.

VI. Conclusion

Averting environmental pollution is one of the tedious tasks since the humans are responsible for this hazardous nature which poses threat to whole world. And we are responsible to eradicate pollution

problems. Virtually all emissions vary from time to time.

It is an excellent concept that will show a new dimension. Although the general and specific objective is very similar, the technological solutions employed are very different.

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