IOT BASED ENVIRONMENT POLLUTION MONITORING SYSTEM

E.Venkateswarlu,

Assistant Professor, Department of ECE, Narayana Engineering College, Gudur, AP, 524101

M.Jyothi Reddy, A.Devendra, B.Appi Reddy, G.Uday Kumar

UG Student, Department of ECE, Narayana Engineering College, Gudur, AP, 524101

Abstract: The proportion of air pollution which is caused by the cars is increasing. In order to solve this serious problem, many countries and regions have already presented a series of emissions standards, meanwhile some methods has been developed, include update motor engine or improve the quality of the gasoline. However, these actions have not brought about a striking effect as we expect. There are also some situations to fail implement these emissions standards. In this project, a wireless inspection and notification system (WINS) through the concept of Internet of Things (IoT) is proposed. By applying the system, it is possible to smoothly realize a green traffic network. In this system we using GSM/ GPRS technology as a low-cost and mature wireless communication method is adopted to collect and transmit emissions information of vehicles. To detect the environment pollution we are using here two different gas sensor i.e. CO sensor and and MQ6 gas sensor with this to detect the environment temperature we using LM35 temperature sensor

Key words: Internet of Things (IOT), Arduino Uno board, wi-fi module ESP8266, MQ-7 gas sensor, M213 noise sensor, LM35 temperature sensor, SY-HS220 humidity sensor, LDR light sensor.

I.INTRODUCTION

As we know the industrial growth drastically increasing, environmental pollution related issues rapidly comes into existence. To fulfill the need of flourishing monitoring system, in our project we are establishing a network called Internet of Things, in which sensing devices are connected with wireless embedded computing system. Internet of Things is a technology that hooks up the sensors with embedded system and allow the data from these sensors to travel over an Internet. We are implementing developing model which is able to monitors the inconstancy of parameter like Air, Noise, Temperature, Humidity and Light.

In the proposed model we use microcontroller ATMEGA328 that is mounted on Arduino Uno board. We are using 5 sensors, MQ-7 as a gas sensor. We are using 5 sensors, MQ-7 as a gas sensor. It detects the concentration of carbon monoxide in air. To measure the fluctuations in noise levels we use M213 high sensitivity microphone sensor module. LM35 is used as a temperature sensor and SY-HS220 as humidity sensor. To measure the intensity of light LDR sensor is used to transfer the data. Over an Internet we are using flexible Wi-Fi sensor ESP8266. The data from these sensors is stored in the cloud. After processing, through hotspot web browser will ask about IP address, by putting IP address web page will create that allows us to monitor the system. We can monitor the parameters on smart phones as well as pc o

II.LITERATURE SURVEY

An Air Pollution Monitoring System for monitoring the combination of major air pollutant gases has been designed, developed, and observed with the wireless standard. This system measures combination of gases such as CO, NO2 and SO2, and using semiconductor sensors. The hardware unit integrates a single-chip microcontroller, air pollution sensors array, a GSM-Module and a GPS-Module. The Central-Server is a high-end personal computer application server with internet connectivity. The hardware unit gathers air pollutants levels (CO, NO2, and SO2), and packs them in a frame with the GPS physical location, time, and date. The frame is finally uploaded to the GSM-Modem and transmitted to the Central-Server via wireless network. The Environmental air pollution has significant influence on the combination of constituents in the atmosphere leading to effects like global warming and acid rains. To avoid such harmful imbalances in the nature, an air pollution measuring system is utmost important. The traditional air quality monitoring system, controlled by the

Pollution Control Department, is extremely costlier. Wireless Sensor Networks are a new and very challenging research field for embedded system design automation, as their design must enforce stringent constraints in terms of power and cost. This attempts to develop an effective solution for pollution measuring using wireless sensor networks (WSN). It focuses on development of a prototype for a Wireless Sensor Network (WSN) that supervises various environmental guidelines of interest in urban areas based on ZigBee protocol.

This is observed through a small device that can be placed anywhere in a city. First, it is studied the operation of ZigBee protocol. Second, it was chosen and tested a ZigBee module and sensors from the market. Then, it was developed a module that supervises: humidity, temperature, light, carbon monoxide, carbon dioxide and oxygen. These data are measured and sent regularly to a base station connected to a computer. These data are stored and processed for presentation on the Internet in this Environment Observation and Forecasting System (EOFS) is an application for supervising and providing a forecasting about environmental circumstances. The air pollution Monitoring system which involves a context model and a flexible data acquisition policy. The context model is used for understanding the status of air pollution on the remote Place. It can provide an alarm and safety guideline depending on the condition of the context model. It also supports the flexible sampling interval change for effective the tradeoff between sampling rates and battery lifetimes. In this Pollution Map is a new automated system that monitors the air quality of urban cities and displays the information using a web service. The system collects pollution data using mobile hardware modules, transmits the data regularly using GPRS to a back-end server, and integrates the data to generate a pollution map of the city using its geographical information system. The pollution map is available at any time from an easy-to-view website.

III.PROPOSED WORK

The IOT is an integrated communication technology, in which the objects are connected anyplace, anytime, anything, anyhow. These objects are having identities, virtual personalities operative in good atmosphere. It uses intelligent interfaces to attach and communicate with sensors, devices and social contexts. The IOT development provides numerous applications on different domains, such as consumer, home, industrial, manufacturing, utilities, energy resources, transportation, environment, safety, security, retail, healthcare, bio sciences automation, smart grid and many others. An efficient monitoring system is required to monitor and assess the conditions in case of exceeding the prescribed level of parameters (e.g., smoke). The extent to which environment gets affected is noted and intimated to the user through the mobile application
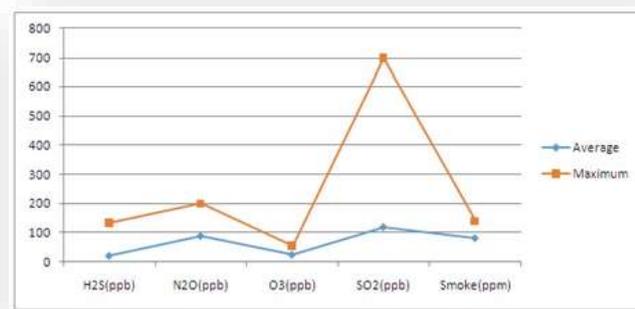
Figure.1. Representation of various pollution causing gases in atmosphere

In figure.1, it indicates the different pollution causing gases in atmosphere and each gas how

much polluting the environment.

1.1 Motivation and Theoretical Overview

Environmental pollution has become a world-wide concern as it is likely to affect the ecological system and human health. The indiscriminate release of harmful chemicals and toxic heavy metals in the environment by industrial, agricultural and other activities of man may adversely affect the quality of our air, water and food resources. These toxic chemicals may find their way to living organisms and human body through food chain and may induce various metabolic disorders. A wide variety of environmental indicators is presently in use. These indicators reflect trends in the state of the environment and monitor the progress made in realizing environmental policy targets. As such, environmental indicators have become indispensable to policy - makers.

However, it is becoming more and more difficult for policy-makers to grab the relevance and meaning of the existing environmental indicators, given the number and diversity of indicators presently in use and new sets of environmental indicators are still to be expected. Therefore, some means of structuring and analyzing indicators and related environment interconnections is needed.

1.2 Overview of sensors

This paper surveys the needs associated with environmental monitoring and long term environmental stewardship. Emerging sensor technologies are reviewed to identify compatible technologies for various environmental monitoring applications. The contaminants that are considered in this report are grouped into the following categories:

- Metals
- Radioisotopes
- Volatile organic compounds and
- Biological contaminants

Sensor requirements are derived from these regulatory metrics and sensor capabilities are then summarized according to contaminant type, the applicability of the different sensors to various environmental monitoring applications is discussed.

1.3 Problem statement

Due to miscellaneous interactions, limited protocol standardization, security of data storage and complex identification systems to access data, problems arises in field of monitoring hence to overcome these problems we are designing, 'IOT based environmental monitoring system' to gain pollution free future live.

1.4 Research objective

Industrialization and urbanization has led to widespread problems relating to environment pollution of air, temperature, water and land. Industrialization has also led to pollution in the above zones. The environmental responsibility and worker safety should be the prime motto of any industry along with productivity and efficiency. This prototype is for harmful toxic gases and shows the real time monitoring of the concentration of the gases in the industrial floor. Which avoided the use of complex routing algorithm but local computations are very minimal. But, here required more time and space to operate, complicated designing and Maintenance is difficult.

1.5 Research Methodology

Here we are trying to develop a system device must be easily integrated with IOT platform, Uniform data format across multiple platforms and   platform must be expandable and Fine-grained data visibility model. Arduino UNO R3 software we are using in this model.Arduino UNO is a microcontroller board based on the ATmega328. Also this software gives a user friendly interface. The main objective of the project is to provide a platform that monitors the parameters and help to create better and pollution free future life.

IV.RESULTS AND DISCUSSION

Result will display on user's smartphone screen or pc.
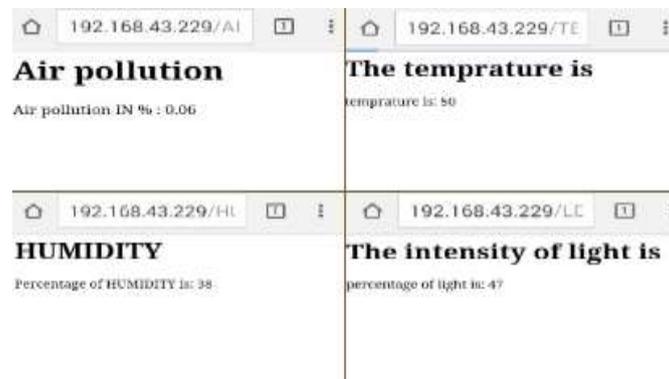
V.CONCLUSION

The proposed system which is designed shows the simulation output of sensing the carbon dioxide gas in air, humidity, noise pollution and temperature pollution in Environment. The sensor output is pushed to cloud and can be viewed through internet. This is a flourishing system which is very useful in industries because of the increasing pollution due to increase in industries. This system is user friendly and cost of the product is affordable. The results of the project are accurate and hence can be implemented in any industries for the safety of workers and the environment.

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