Pollution Monitoring System Using Iot

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ABSTRACT: In Infrastructure and industrial plants the rapid growth creating environmental issues like pollution (Air, Water, Temperature)In this context where combination of many challenges of computer science, wireless communication and electronics; the Smart Sensor Networks are an emerging field of research. In this paper a solution to monitor the air and noise pollution levels in industrial environment or by using wireless embedded computing system a particular area of interest is proposed. The technology like Internet of Things (IoT) is included in the form of solution which is outcome of merged field of computer science and electronics.

KEYWORDS: IoT, IAQ, LDR, pollution,

I. INTRODUCTION

Pollution is the biggest problem of every nation, whether it is developed or developing. Health problems are growing at faster rate especially in urban areas of developing countries. In contrast to this, indoor air quality degraded during this same period because of many factors like reduced ventilation, energy conservation and the introduction to new sources and new materials that cause indoor pollution. This increases the need for indoor air quality (IAQ) monitoring Due to this fact and use of new building materials, IAQ often reaches to unacceptable levels. As we know the industrial growth drastically increasing, environmental pollution related issues rapidly comes into existence.

To fulfil 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 hook 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. detect 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 or laptop.

II. EXISTING SYSTEM

The earlier method is used to monitoring the sensors data into the system. The data will be display only by the lcd level. So the data can be managed only by the authorize person. There will delay to alert the people about the causes in that surroundings. And Some of the disadvantages of using lcd displays are that they are not suitable for dimly lit applications, can require frequent adjustments throughout the day, have limited viewing angles, and their purchase cost is relatively expensive.

➤ Drawback of existing system
➤ Required more time and space to operate
➤ Complicated designing
➤ Maintenance is difficult

III.   PROPOSED SYSTEM
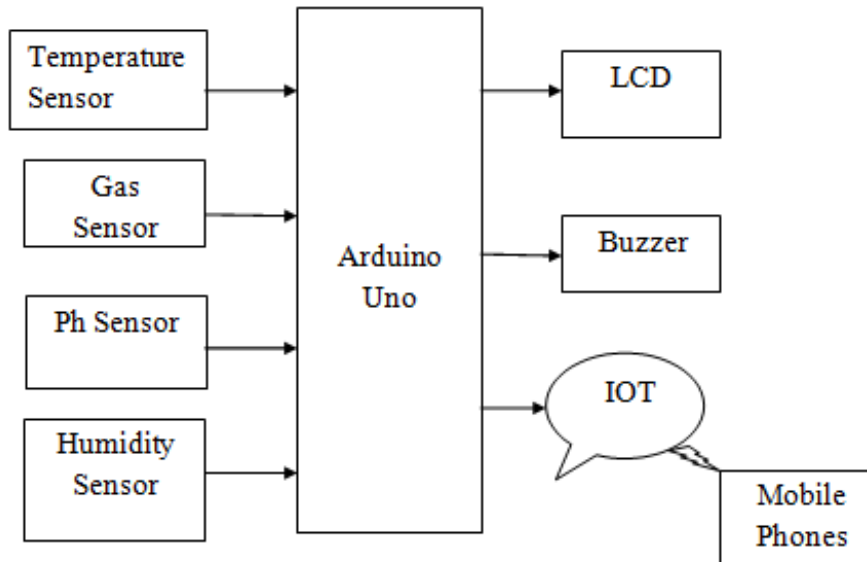
Block diagram of Pollution Monitoring System Using IoT

In this proposed method is used to implemented by IoT. In this method all the types of pollution can be monitored and controlled. In this method the data can be directly updated to the cloud .When the level of pollution increasing the limit then the Information has been send to the people and to the authorized person. By updating the data through the cloud people can easily known about the level of pollution with the help of their mobile phones itself. Previously we have built the LPG detector using MQ6 sensor and Smoke detector using MQ2 sensor but this time we have used MQ135 sensor which is the best choice for monitoring Air Quality as it can detects most harmful gases and can measure their amount accurately.

IV. HARDWARE USED

ARDUINO UNO:
The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and analogue input/output pins that may be interfaced to various expansion boards and other circuits. simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

Prototype of Arduino Uno
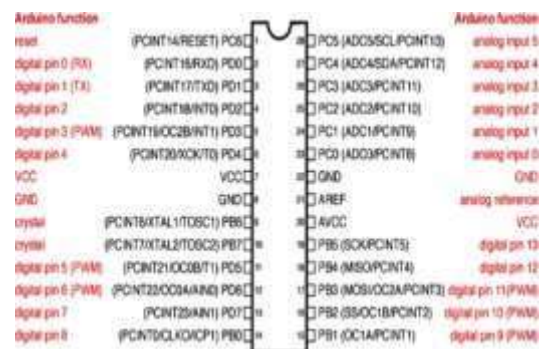
Pin Diagram of Arduino UNO

GAS SENSOR:
Gas sensors are chemical sensors that are of paramount importance. A chemical sensor comprises of a transducer and an active layer for converting the information into another form of electronic signal like frequency change, current change or voltage change. However, for many centuries, different gas

sensor technologies have been used for different gases detection including semiconductor gas sensors, catalytic gas sensors, electrochemical gas sensors, optical gas sensor and acoustic gas sensors

Prototype of Gas Sensor

PH SENSOR:

The pH Sensor can be used for any lab or demonstration that can be done with a traditional pH meter, including: acid-base titrations, monitoring pH in an aquarium, and investigating the water quality of streams and lakes.

Prototype of PH Sensor

TEMPERATURE SENSOR:

The LM35 is an integrated circuit sensor that can be used to measure temperature with an electrical output proportional to the temperature (in °C). It can measure temperature more accurately than a using a thermistor.


Prototype of Temperature Sensor

The sensor circuitry is sealed and not subject to oxidation. The LM35 generates a higher output voltage than thermocouples and may not require that the output voltage be amplified. The LM35 has an output voltage that is proportional to the Celsius temperature. The scale factor is $.01V/°C$.

HUMIDITY SENSOR:

A humidity sensor (or hygrometer) senses, measures and reports the relative humidity in the air. It therefore measures both moisture and air temperature. Relative humidity is the ratio of actual moisture in the air to the highest amount of moisture that can be held at that air temperature. Humidity sensors detect the relative humidity of the immediate environments in which they are placed. They measure both the moisture and temperature in the air and express relative humidity as a percentage of the ratio of moisture in the air to the maximum amount that can be held in the air at the current temperature.
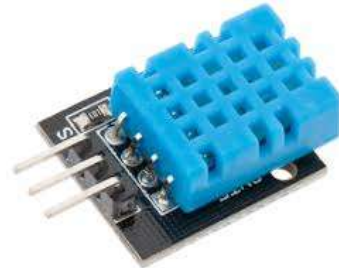
Prototype of Humidity Sensor

LCD DISPLAY:

LCD is used to display the results of the system operation such as sensed values, motor status etc A liquid-crystal display (LCD) is a flat panel display, electronic visual display, or video display that uses the light modulating properties of liquid crystals. Liquid crystals do not emit light directly. The LCD standard requires 3 control lines and 8 I/O lines for the data bus. The most commonly used Character based LCDs are based on Hitachi's HD44780 controller or other which are compatible with HD44580.

Prototype of LCD Display

BUZZER:

A buzzer or beeper is a signalling device, usually electronic, typically used in automobiles, household appliances such as a microwave oven, or game shows. It most commonly consists of a number of switches or sensors connected to a control unit that determines if and which button was pushed or a preset time has lapsed, and usually illuminates a light on the appropriate button or control panel, and sounds a warning in the form of a continuous or intermittent buzzing or beeping sound. Initially this device was based on an electromechanical system which was identical to an electric bell without the metal gong (which makes the ringing noise).

Prototype of Buzzer

V. SYSTEM IMPLEMENTATION

Hardware Output of Proposing System

The earlier method is used to monitoring the sensors data into the system. The data will be display only by the lcd level. So the data can be managed only by the authorized person. There will delay to alert the people about the causes in those surroundings. Drawback of existing system are Required more time and space to operate, Complicated designing and Maintenance is difficult. In this proposed method is used to implement by iot. In this method all the types of pollution can be monitored and controlled. In this method the data can be directly updated to the cloud. When the level of pollution increasing the limit then the information has been send to the people and to the authorized person. By updating the data through the cloud people can easily known about the level of pollution with the help of their mobile phones itself. So the time required to allot the people about the pollution becomes easy and they can immediately save their lives.

VI. CONCLUSION

The smart way to monitor environment and air as well as sound pollution being a low cost but efficient and embedded system is presented in this paper. Our project device showed that it is effective and cheap and with some highly working sensors it can really be a reliable one to everybody and its data will be a key to take some necessary steps for the betterment of the society as it will help to identify the affected area so that we can take early steps to reduce damages for the next generation.

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