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IOT Based Rain and Gas Alert System

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ABSTRACT: Safety plays a major role in today's world and it is necessary that good safety systems are to be implemented in places of education and work. This work modifies the existing safety model installed in industries and this system also be used in homes and offices. The main objective of the work is designing microcontroller based toxic gas detecting and alerting system. The hazardous gases like LPG and propane were sensed and displayed and notify each and every second in the LCD display. If these gases exceed the normal level then an alarm is generated immediately and also an alert message (SMS,Email,Application Pop-up) is sent to the authorized person through the INTERNET and used ARM development board. The advantage of this automated detection and alerting system over the manual method is that it offers quick response time and accurate detection of an emergency and in turn leading faster diffusion of the critical situation.

KEYWORDS: Air pollution Monitoring, gas sensors, Raspberry pi or texas module, wireless networks.

I. INTRODUCTION

The Internet of Things is an emerging topic of technical, social, and economic significance. Consumer products, durable goods, cars andtrucks, industrial and utility components, sensors, and other everyday objects are being combined with Internet Connectivity and powerful data analytic capabilities that promise to transform the way we work, live, and play. Projections for the impact of IoT on the Internet and economy are impressive, with some anticipating as many as 100 billion connected IoT devices and a global economic impact of more than $11 trillion by 2025. The Internet of Things (IoT) is an important topic in technology industry, policy, and engineering circles. This technology is embodied in a wide spectrum of networked products, systems, and sensors, which take advantage of advancements in computing power, electronics miniaturization, and network interconnections to offer new capabilities.
The large-scale implementation of IoT devices promises to transform many aspects of the way we live. For consumers, new IoT products like Internet-enabled appliances, home automation components, and energy management devices are moving us toward a IoT systems like networked vehicles, intelligent traffic systems, and sensors embedded in roads and bridges move us closer to the transform agriculture, industry, and energy production and distribution by increasing the availability of information along the value chain of production using networked sensors.

II. LITERATURE SURVEY

In the year of 2008, LIU Zhengyi, WANG Zhen-dong and CHENRong, "Intelligent Residential Security Alarm and Remote fire alarm, toxic gas leakage remote automatic sound alarm and remote control system, which is based on 89c51 single chip computer. The system can perform an automatic alarm, which calls the police hotline number automatically. It can also be avoice alarm and shows alarm occurred address. This intelligent security system can be used control the electrical power remotely through telephone.applications a remote monitoring system based on SMS through GSM In the year of 2002, K. Galitsis, W. Wlodarsla, K. Kalantar-Zadeh and A. Trinchi, "Investigation of gas sensors for vehicle cabin semiconducting (MOS) gas sensors. In this paper, commercially available gas sensors are compared with fabricated Moo3 based sensors possessed comparable gas sensing properties. The sensor has response 74% higher relative to the best commercial sensor tested.

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III.MOTIVATION OF WORK

- Gas leak accidents that made many
- People to loss life in different parts of country

The gas leak from a chemical plant in Visakhapatnam in which at least 11 people were killed and 1,000 affected on Thursday is one in a long list of industrial accidents resulting from poisonous gases seeping into the air.

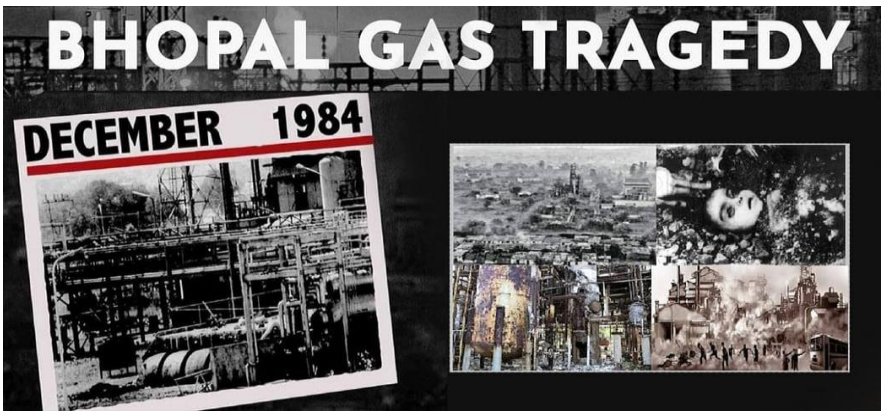
The December 1984 Bhopal tragedy in which more than than 3,000 people were killed when methyl isocyanate leaked out is the world's worst industrial disaster. Here are other gas leaks that made headlines in the last few years:

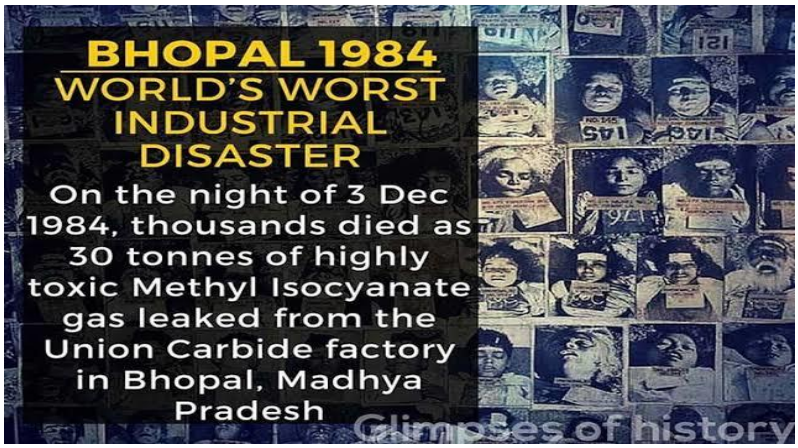
Bhilai, Chhattisgarh: On June 12, 2014, there was a leak in a methane gas pipeline at the Bhilai plant of Steel Authority Of India Limited (SAIL). Six people, including two deputy general managers of the company, were killed and over 50 injured.

Nagaram, Andhra Pradesh: On June 27, 2014, a massive fire broke out following a blast in Gas Authority of India Limited's plant, killing 29 people and injuring 10. The 18-inch underground pipeline, designed to supply gas to the Lanco power plant,was used for transporting wet gas having condensate/water. This corroded the pipe and led to a gas leak. An ignition triggered the explosionand the subsequent fire.

Mangaluru, Karnataka: On November 17, 2016, a gas leak in an HPCL running between Mangaluru-Hassan-Mysuru and Solur created panic in villages in the area. Several people were reportedly hospitalised after they inhaled the gas. The leak was spotted early on and was contained before much damage.

Kanpur, Uttar Pradesh: At least five people were killed and several injured in an explosion caused by an ammonia gas leak in the Katiyar cold storage in Kanpur on March 15, 2017. The explosion caused the roof of the building to collapse, trapping several people.





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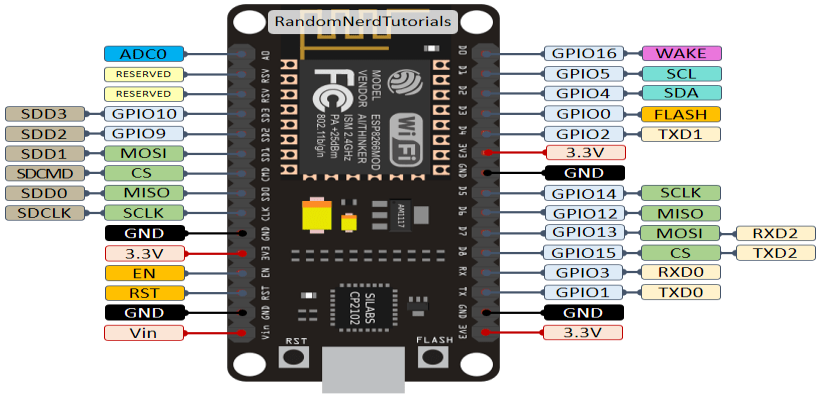
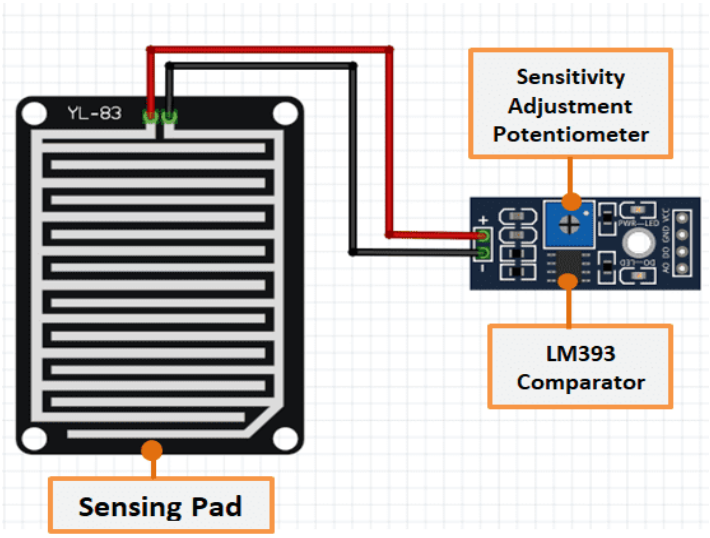
ARCHITECTURE

- NodeMCU:



- NodeMCU is an open-source Lua based firmware and development board specially targeted for IoT based Applications.
- It includes firmware that runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module.

- Rain Sensor Module



- The sensor is made up of a sensing pad where the rain drops are collected. This pad has nickel traces arranged to form positive and negative terminals that get bridged when rain drops fall on the pad.
- There is another electronics module based on the LM393 comparator and a sensitivity adjustment potentiometer. This module is for reading the signals from the sensing pad and sending a digital or analog signal to the Node mcu.
- The sensing pad acts as a variable resistor whose resistance varies according to the amount of water on its surface. This resistance varies inversely with the amount of water on the pad's surface.
- The more water on the surface means better conductivity and will result in a lower resistance and vice versa. The sensor produces an output voltage according to the resistance which when measured we can determine whether it's raining or not.

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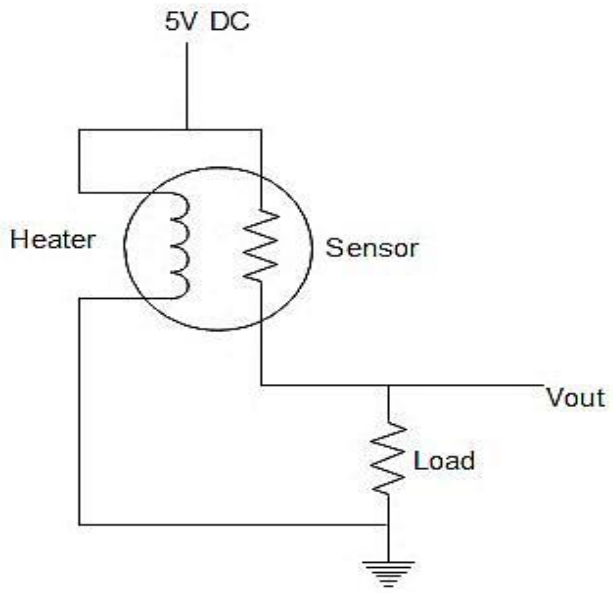
- MQ-2 Gas Sensor Module



- Liquefied Petroleum Gas (LPG) or the sensitive material of MQ-2 gas sensor is SnO2 considered as lower conductivity in the clean air. The conductivity of the sensor shown in Figure 4 gets higher as long as gas concentration is elevated. The sensitivity of MQ-2 sensor is considered exceptionally higher to propane, LPG, hydrogen, methane, and the other steams. Moreover, the cost limitation of the proposed sensor is assigned to be appropriate for numerous applications.
- The sensor realizes the flammable gas by an increase in the temperature when excited by the heating components. As a working principle, when gas leak is detected the conductivity of the sensor gets higher proportionally with gas concentration raising.

IV. METHODOLOGY

An overall conclusion IOT based toxic gas detector, or IOT technology has come a long way since it was conceptualized two decades ago.
It has become more efficient, more applicable to today's applications and smarter. The work presented in this project was directed towards pushing IOT technology to the next level.
The work has presented solutions to several problems and issues that have not been addressed in previous work.
The principle of operation of Operation of IOT based gas leakage and monitoring system was shown by operating the Raspberry pi 3 model attached with embedded system with required input and output gas level with the help of gas sensors.
This results in a more efficient in operation because it is connected to a common web page specially built to notify or email the responsible authority automatically so reduces the stress of constant monitoring.
The choice of using a real time gas leakage monitoring and sensing the output levels of gas has been clearly observed by the help of this system.

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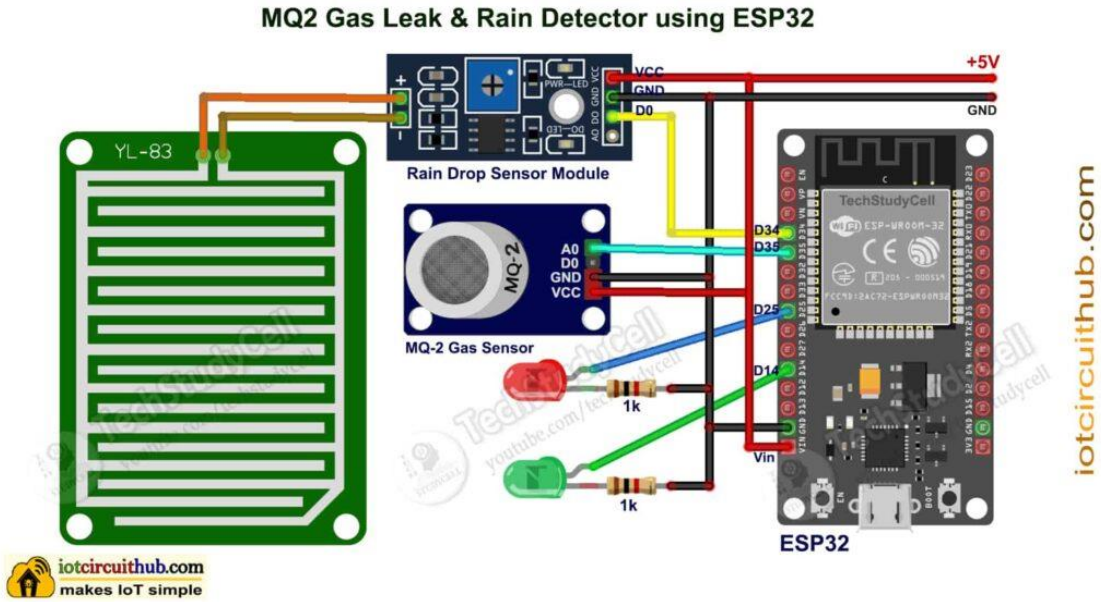
V. CIRCUIT DIAGRAM



IV. CONCLUSION AND FUTURE WORK

- An overall conclusion IOT based toxic gas detector, or IOT technology has come a long way since it was conceptualized two decades ago.
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