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Chemical Leakage Detection And Remedies Using Internet of Things(IoT)

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Abstract— **The Main concern of this project, has not remain unturned by IoT. Therefore we have used the IoT technology to make a Gas Leakage Detector for a society that having Smart Alerting techniques involving sending text messages to the concerned authority and an ability to perform data analytics on sensor readings. Our main aim is to propose a gas leakage system for a society where a room has gas leakage detector hardware. This Project will be detecting the harmful gas in the surrounding and alerting the society member present at that time through an alarm and sending the notification.**

Index Terms— **Node MCU, Gas leakage detection, Internet of Things (IoT), Remote sensing, Smoke sensor.**

I. INTRODUCTION

The System consists of gas detector sensors, an Arduino board, ESP8266 (Wi-Fi Microchip), and a Cloud server. Society admin is capable of adding the details of per flat user such as Unique user name, contact number, per user of flat sensor information. Society admin has the capability to configure the provided threshold value of that of each sensor. Sensors can sense the value per time. The system can send the values to a cloud server. The server can Check that the sensor values existed the threshold value. Incase the sensor value exceeds the limit the respective server could send the specified command to the connected hardware by making the alarm buzz and the Respective Server also sends the provided notification message to the end user.

II. EXISTING SYSTEM

This system is based on the Arduino UNO R3 and MQ-6 gas sensors. When the sensor detects gas in the atmosphere, it will give digital output 1 and if gas is not detected the sensor will give digital output 0. Arduino will receive the sensor output as a digital input. If the sensor produces an output showing high, then the buzzer will be started along with tuning with the LCD that will show that "Gas Presence: Yes". If the sensor output shows lower then the buzzer will not be tuning, and the LCD will show that "Gas presence: No". The buzzer consists of a number of sensors connected to the respective control unit present in the system. This Condition determines which button to be pushed or it has to be preset time elapsed type, and usually illuminates a lighton the appreciate button or control panel.

III. PROPOSED SYSTEM

A. System overview

The proposed system is based on inexpensive locally manufactured (design and implemented) wireless sensor devices. The proposed system is a cluster-based WSN that is suitable for gas monitoring applications.

Our proposed system includes new communication protocols and hardware components that fully utilize the IoT functionalities and capabilities in WSN's at the network level such that the network performance is improved. To have control over such conditions we proposed a system that uses sensors which is capable of detecting the gases such as LPG, CO_2, CO, and CH_4. This system will not only able to detect the leakage of gas but also altering through audible alarms. With the presence of excess amounts of harmful gases

In the environment then this system can notify the user. The system can notify to society admin about the condition before gas leakage takes place through a message. Sensor value crosses the limitation of the server, which can be sent to the command to hardware for making the alarm buzz and the respective server also starts sending the notification message to the individual user. This is our methodology for using future purposes.

IV. BLOCK DIAGRAM
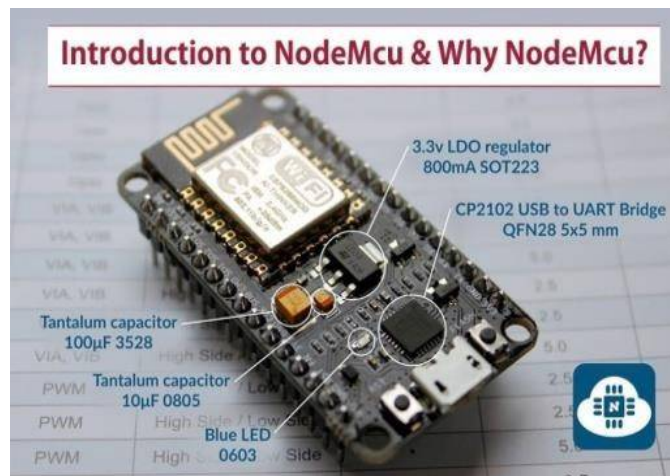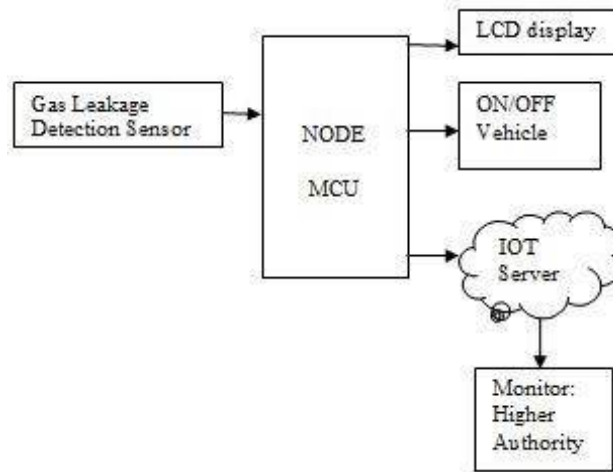
Node MCU

Node MCU is the open source firmware which is open source prototyping board functioning which is namely, "NodeMCU"(micro-controller unit). The "NodeMCU" technically referring to the firmware other than the connected development kits.

1) LCD(16 * 2)

The General resolution of LCD could be very high, and the respective ppi (pixels per inch)of general phones could reach more than 300 value.

The Pin Configuration regulates the difference based on contents of the display, it is used to make connection for changeable POT that could supply between 0 to 5V.

Gas Sensor(MQ2)

Grove – Gas Sensor (MQ2) is used for the detection of combustible gases, Inflammable Gas and smoke. It detects the combustible gas as well as leakage smoke. The output voltage produced from the Gas sensor increases when there is increase in the concentration of gas.
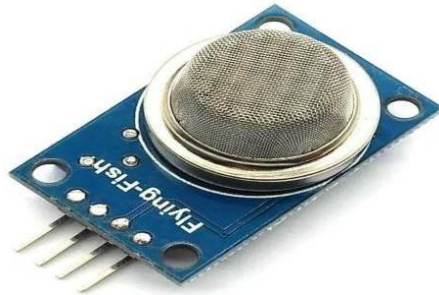

When semiconductor particles is heated in the open air at high temperatures and pressures, oxygen is adsorbed over the surface. In clean air in the atmosphere , donor electrons present in tin dioxide which were attracted towards the oxygen which is adsorbed on the surface of the respective material. This prevents electric current flow.
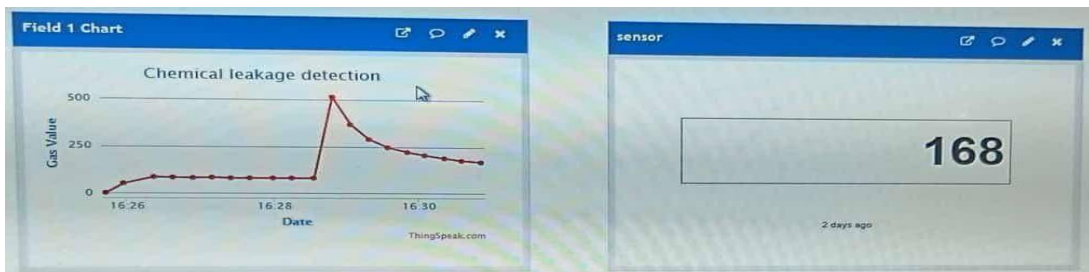
V. FLOW CHART
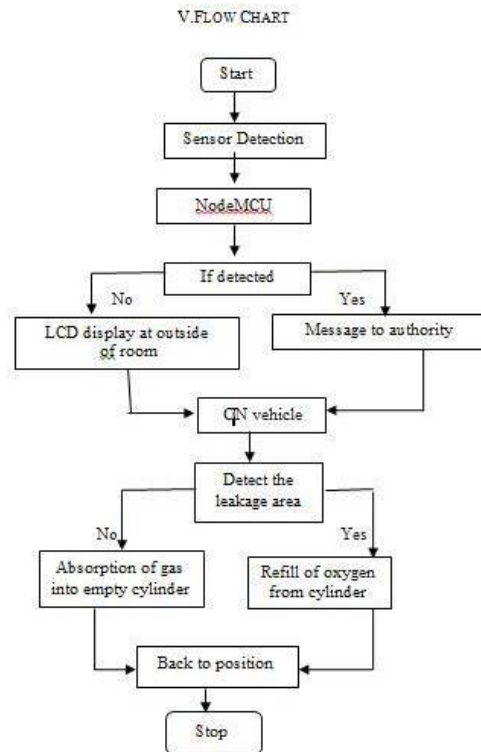
V. COMPONENTS

- Gas sensor (MQ2)
- NodeMCU
- LCD Display
- Buzzer
- Air cylinder
- Compressor

VI. SYSTEMATIC BLOCK DIAGRAM
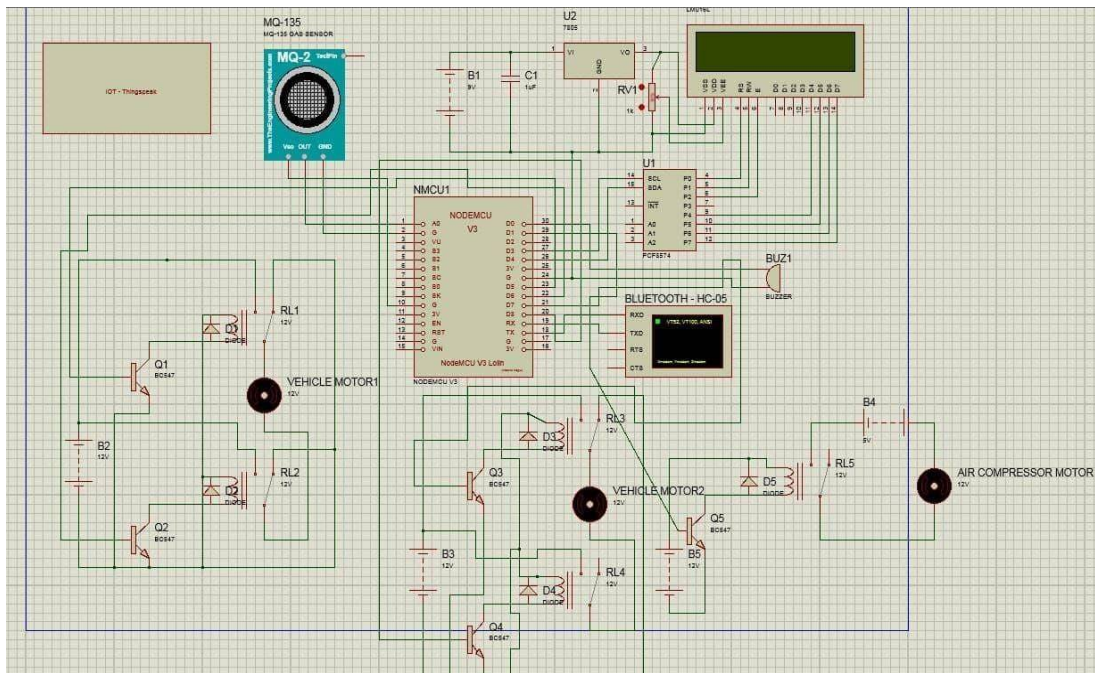
VII. EXPERIMENT RESULT

VIII. FUTURE WORK

In the user Application for this system, so many specification features can be added. The overall features will make the system Safer for the users. After preparing the final prototype withspecification multifunctional operational Features, the system will be implemented. A survey takes place after using the system. Summarizing

all the results, finding and analyzing a research article will be done And the author has plans to submit it to the MQ2 sensors journal for review. In a future paper, the Features of this final product will be compared with the available gas detector systems presented in Other articles.

IX. CONCLUSION

This Methodology and it's application can be a Great use of Domestic and related safety appliances. As Long as the need of Industrialization Safety, there will be demand for such Detection Low-Cost Efficient Products. In such a way, This Ideology creates a revolution in the case of Economy based on Safety Industrial Development. The Design of this sensor-dependent automatic gas leakage detector with a alert and control system which has been proposed and improved in this paper.

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