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| ***Project Name*** | ***IoT Based gas leakage monitoring and alerting system*** |

# FINAL PROJECT

## Abstract:

The presence of hazardous LPG gas leakage in a domestic, work place, also, stored gases container gas which exhibits ideal characteristic is use. For that sake, an alarm unit is used to vibrate an alarm which is buzzer. Buzzer gives an audible sign of the presence of LPG volume. The sensors are widely used to detect essence of propane, iso-butane, LPG and even smoke. The sensor has an advantage to combine a sensitivity response time. If the LPG sensor senses gas leak from work place or home, sensor output goes to active low (logic-0) condition. Arduino UNO is used in the project; low signals are overlooked by the Arduino and gas leakage is been noticed by the Arduino. The Arduino UNO turns on the LCD and buzzer. It even turns on the GSM modem after that, it continues to send messages SMS to mobile number specifically mentioned in the program of the source code for alerting danger to the people.

## INTRODUCTION:

Gas leakage leads to various accidents resulting in both material loss and human injuries. The risk of explosion, firing, suffocation are based on their physical properties such toxicity, flammability, etc. The number of deaths due to explosion of gas cylinders has been increasing in recent years. The reason for such explosion is due to substandard cylinders, old valves, worn out regulators and lack of awareness in handling gas cylinders. The LPG or propane is a flammable mixture of hydrocarbon gases used as fuel in many applications like homes, hostels, industries, automobiles, vehicles because of its desirable properties which include high calorific value, less smoke, less soot, and meager harm to the environment. Natural gas is another widely used fuel in homes. Both gases burns to produce clean energy, however there is a serious problem of their leakage. Being heavier than air, these gases do not disperse easily. It may lead to suffocation when inhaled and may lead to explosion .Due to the explosion of LPG, the number of deaths has been increased in recent years. To avoid this problem there is

a need for a system to detect the leakage of LPG. Gas leak detection is the process of identifying potentially hazardous gas leaks by means of various sensors . Several designs of LPG detection and alert system have been proposed in the literature. designed kitchen gas leakage detection and automatic gas shut off system . T.Soundaryaet al. presented the cylinder LPG gas leakage detection system . Wireless and GSM technology [5] based gas detectors have also been proposed. This paper presents a LPG leakage detection and alert system to avoid fire accidents and to provide house safety.

## Related works:

Wireless modularization of gas safety devices. -Smart home gas safety management system based on wireless modularization of gas safety devices was designed to allow safety in the homes in other to reduce damages. The system is based on the commercially available intelligent Micom meters, which have enhanced standard gas meters with a built-in microcontroller and a cutoff valve. The system is primarily concerned with detecting fire breakouts, and the existing gas meter has been upgraded to communicate with an external smoke and CO detecting sensor, as well as fire extinguishing modules, which are used to extinguish the fire when the temperature exceeds the threshold. The requirement for an existing Micom meter to construct the enhanced gas and fire safety method is a disadvantage of this system, as it lacks independent application. [10] developed a gas leakage detection and location system based on wireless sensor networks. They used wireless sensor networks to detect gas leakages and ensure product safety in the petrochemical industry. The system emphasizes the importance of developing centralized location software by collecting data from wireless RF sensors in order to precisely pinpoint the location of gas leakage and aid in the response time reduction In spite of the absence of remote monitoring and automatic shutoff, the study emphasizes the importance of inter-node communication in developing a dependable leakage detection system

## IoT platform:

The proposed system will use an Arduino microcontroller detector system to sense the gas with the help of a sensor. In which the MQ6 sensor used in this system interfacing with Arduino is implemented in this project and the signal from the sensor is sent to the microcontroller which is connected to communicate with the LCD, send a signal to the buzzer to sound an alarm when there is leakage and also send a message through the GSM module. The GSM module is a piece of hardware that connects to a remote network, this does not involve an internet or hotspot wifi which makes it more recommendable than the IOT leakage method which has could fail due to network failure and unaffordable equipment to low-income earners and also has a quick response gas leakage. In this research work, the hardware component to be used is Arduino Uno Micro-controller, GSM Module (SIM800), MQ6 Gas sensor, Buzzer, Power Module, Stripped Vero board, Female and Male Pin header, OLED Display, 3D printed case, Power Switch, LEDs, connectors, and Lithium Polymer Rechargeable Battery.

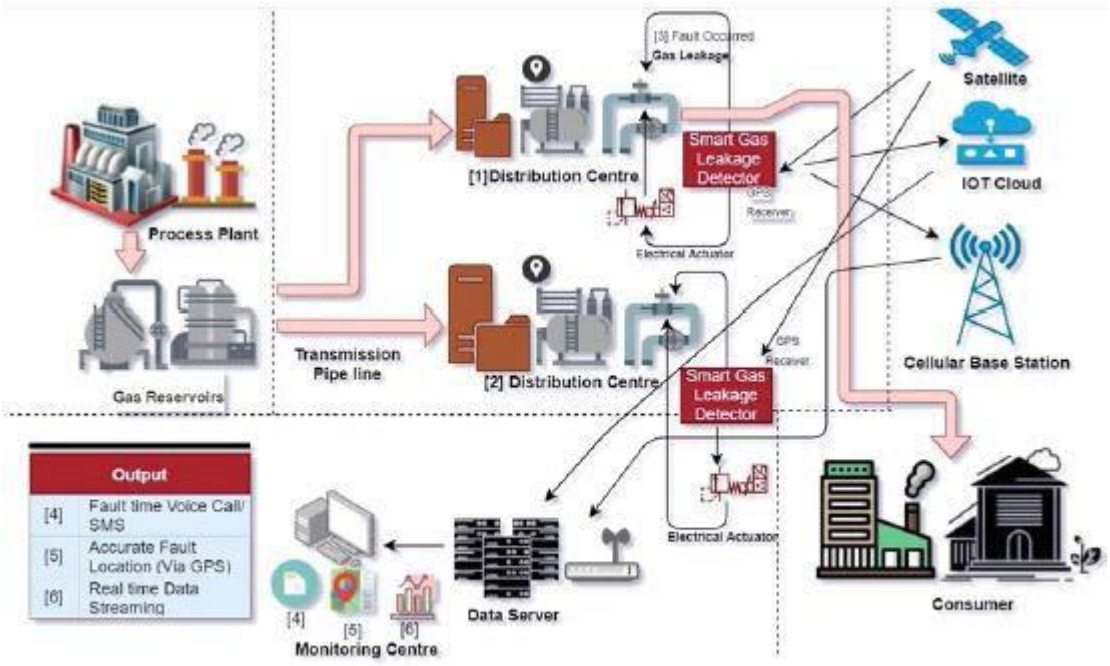


**Figure 6.** System and control diagram of outdoor gas leakage detection.

## Conclusion :

This work presents the design and implementation of gas leakage detection system. Various works on gas leakages detection system was reviewed and presented. I was discovered that some of the existent research don't takes in to considerations the cost effectiveness for the purpose of implementation of gas leakages detection at individual/domestic uses, and not easy to be further modified. This research work had advanced in knowledge as it included an embedded system to alert users via multiple mobile phones for further action to be taken when leakage is detected. The device detects gas leakage using a highly sensitive MQ-6 gas sensor to activate a buzzer that alert people of leakages, and also sent an SMS with the information "Gas Leakage Detected" from the SIM800 GSM Module as a backup to alert the appropriate authority or facility owner of a gas leakage. This design could be adopted, funded, and implemented as it has a great potential of mitigating against accidents associated with LPG leakage.