

## **Ideation Phase**

### **Empathize & Discover**

Date	18 October 2022
Team ID	PNT2022TMID24259
Project Name	Gas Leakage Monitoring and Alerting System
Maximum Marks	4 Marks

# **Gas Leakage Monitoring and Alerting System**

### **Abstract:**

The Internet of Things (IoT) is an emerging technology in which social environments are connected through various sensors linked together. The sensors can communicate data with each other using an internet connection. Gas leaks can be dangerous, especially in confined spaces. In these cases, a security system with high leak detection capability is required. This is because the gas is volatile and there is a possibility of leakage which will be very prone to explosion or fire hazard. The early gas leak detection device is a very suitable solution for the early detection of LPG leakage to minimize the occurrence. For this reason, a buzzer is used. The buzzer gives an audible indication of a gas leak. After that, it even turns on the GSM modem, continues to send SMS messages to the mobile number specifically mentioned in the source code program to alert people of danger.

## **Literature Survey**

**A. Mahalingam, r. T. Naayagi, n. E. Mastorakis**

### **[Design and Implementation of an Economic Gas Leakage Detector]**

Designed a cost economic gas leakage detector. They adopted UK safety standards for the design of the system. Their proposed system mainly detects LPG leakage and also the amount of gas leakage. It mainly detects gases like propane and butane. The safety level of butane gas is 600 ppm above which it is considered hazardous.

When the gas level in the air increases, the system produces audio alarms warning the people/workers in industry about the gas leakage.

**Prof. M.Amsaveni, A.Anurupa, R.S.Anu Preetha, C.Malarvizhi, M.Gunasekaran[GSM based LPG leakage detection and controlling system]**

LPG gas leak is detected by the MQ-6 gas sensor. The analog output is sent to the microcontroller.

It Consists of predefined set of instructions. Based on the instructions specified, the exhaustfan gets turned on. The gas concentration in the room will be reduced. Then the steppermotor rotates, closing the cylinder knob. Then, the gas leak is stopped. Then the buzzer sounds an alarm that signals a gas leak. The user is then notifiedby SMS via GSM module. They designed a methodology that the system takes automaticcontrol action upon detection of 0.001% LPG leakage. This automatic control is provided by a mechanical handle to close the valve. They increase safety for humans with a relay thatwill turn off the electricity supply to the house. They also use GSM to send a warning message to users and a buzzer is available to alert the workers about leakage.

**Falohun A.S., Oke A.O., and Abolaji B.M.**

**[Dangerous Gas Detection using an Integrated Circuit and MQ-9]**

A gas detection using integrated circuit and MQ-9 is made. They basically used a built-in design which includes typical input and output devices such as switches, relays, solenoids, LEDs, small or custom LCDs displays, radio frequency devices and sensors for data such astemperature, humidity, light level, etc.

Embedded systems typically do not have a keyboard, screen, disks, printers, or other recognizable I/O devices personal computer and may lack human interaction facilities. Number and type of detectors and the type of fire alarm system one chooses for property

protection will depend on the owner's property protection objectives, property value and the requirements of the owner's insurance company.

**Zhao Yang, Mingliang Liu, Min Shao, and Yingjie Ji**

**[Research on Leakage Detection and Analysis of Leakage Point in the Gas Pipeline System]**

They told about the leak detection research and leak point analysis in the gas pipeline system. They gave different models that used SCADA I/F Model: SCADA system has a transmission function acquired data from the pipeline system to the transient simulation model every 30 seconds. This module communicates with SCADA. Various parameters are collected every 30 seconds such as temperature, pressure and flow. Transient Simulation Model: Transient flow is simulated using a perfect numerical calculation method based on real data. Pressure and temperature serve as independent variables to get the average pressure and average temperature. Then all gas parameters in the pipe system can be obtained. Leak detection: Leak detection is done by comparing data obtained through the SCADA system with the Transient Simulation Model. This model could provide leak site assessment and rapid warning based on transient simulation and volume balance.

**Hina Ruqsar , Chandana R , Nandini R , Dr. T P Surekha**

**[(IOT) based Real time Gas leakage Monitoring and Controlling]**

They designed a system that perform both the task that is gas leak monitoring and detection. For this real-time data is available through real-time transmission internet. They used the Xively IOT platform to provide real-time sensor data over the internet.

**Srinivasan, Leela, Jeya bharathi, Kirthik, Rajasree**

**[Automatic LPG Sensing Device with Switching Off Mechanism]**

They talked about a gas leak detection and control. The gas leakage leading to the fatal inferno became serious problem in households and other areas where domestic gas is handled and used. Notifies subscribers via alarm and status display in addition to shutting off the gas supply valve as a primary safety measure.

**Hitendra Rawat, Ashish Kushwah, Khyati Asthana, Akanksha Shivhare [LPG**

**Gas Leakage Detection & Control System]**

They mentioned security problems against hooligans, spills and fire. In these cases, their framework sends an SMS

to the emergency number assigned to it.

**Ch. Manohar Raju and N. Sushma Rani**

**[AN ANDROID BASED AUTOMATIC GAS DETECTION AND INDICATION ROBOT]**

They introduced an android based automatic gas detection and indication robot. Their proposed prototype depicts a mini mobile robot which is capable to detect gas leakage in hazardous places. Whenever there is a gas leakage, the robot immediately identifies it and sends the data to android mobile through wireless communication like Bluetooth. They developed an android application for android based smartphones which can receive data from robot directly through Bluetooth. The application signals an indication whenever there is a gas leakage and they can also control the robot movements via Bluetooth by text as well as voice commands. The previous mobile robots are based on heterogeneous technologies like GPS, GSM & internet based etc., but the main disadvantage of those prototypes were the lack of communication in specific areas. So, with the rapid developments and tremendous changes in technology. They have implemented some of the techniques to remove such previous problems. Wireless communication protocols play a vital role in present trends. Bluetooth, WI-Fi, Zigbee etc., They use one of the best features of smartphone, i.e., the Bluetooth technology to control and monitor the robot.

They present a robot and a mobile application for. Meanwhile; the system prototype impressively proved its use and capabilities in an intensive series of tests. Power unit, navigation system and therefore, the additional sensor systems performed excellently during the tests. Robot facilitates independent gas detection and leak localization in places that are otherwise problematic access. Additionally, it helps avoid mishandling human inspectors in a potentially dangerous situation environment. However, more development (e.g. blast protection, package development, etc.) and in fact legal issues should be dealt with earlier preparation in a business environment. Nevertheless, it is certain that autonomous, mobile gas detection and leakage a locator robot is possible today and can significantly increase security.



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