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# LPG Level Monitoring, Booking and Gas Leakage Detector

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**ABSTRACT**: Home Fires have taken a growing toll in lives and property in recent years. LPG is exceptionally inflammable and can consume even at some separation from the wellspring of spillage. Most fire mishaps are caused on account of a low quality elastic tube or when the controller isn't killed. The supply of gas from the controller to the burner is on even after the controller is turned off. Unintentionally, if the handle is turned on brings about the gas spills. This undertaking manages the recognition, checking and control arrangement of LPG spillage. The gas sensor MQ-6 is extremely touchy to methane and propane which are fundamental constituents of LPG. A heap cell is utilized to quantify the heaviness of chamber persistently. The heaviness of barrel is shown ceaselessly and some 4-5 MQ-6 sensors will be put in better place of room, yield of sensor will turn out to be high when there is LPG spillage is available. At the point when the sensor yield is high signal will be exchanged on. Utilizing transfer DC engine the stove handle is consequently controlled. Alongside security measures the framework has extra preferred standpoint of programmed rebooking of barrel when the level of gas goes underneath the ordinary weight of chamber.

**KEYWORDS:** LPG leakage, gas sensor MQ-6, DC motor.

## I. INTRODUCTION

Flammable gas, if leaked it can cause major damage life and property. Accordingly it ought to be utilized as a part of safe dealing with way and extra care must be taken keeping in mind the end goal to keep any spillage conceivable. The fundamental highlights of LPG is that being heavier than air, it don't scatter effortlessly and may prompt suffocation when breathed in. The spilled gasses when touched off may prompt blast. The quantity of passing because of the blast of gas chambers has been expanding as of late. Presently a day's people are having extremely bustling timetable and henceforth once in a while they overlook or don't get enough time for booking the gas from the gas organization. So it would be much simpler and supportive if there was an arrangement to book the gas naturally. A noteworthy measure of gas is being squandered because of the lack of regard of customer's .Sometimes they neglect to kill the burner which may likewise could prompt harms. Our proposed theme goes for discovery of gas spillage and programmed controlling of gas valve.

The shrewd gas framework which gives home security distinguishes the spillage of the LPG and cautions the customer about the break by a notice through by utilizing android application through Internet of Things (IOT) and customer can kill the gas valve, from anyplace on the planet.

Gas leakage leads to various accidents coming about into both money related misfortune and also human wounds i.e. injuries. In human's day by day life, condition gives the most critical effect to their medical problems. The danger of terminating, blast, suffocation all depend on their physical properties such combustibility, poisonous quality and so forth. The quantity of passing because of the blast of gas chambers has been expanding as of late. The explanation behind such blast is because of sub standard barrels, old valves, exhausted controllers and absence of mindfulness utilizing gas chambers add to the dangers. Investigations by oil organizations found that numerous LPG shoppers are uninformed of security checks of gas barrels. Another reason is illicit filling of gas chamber likewise causes mishaps. There is a requirement for a framework to identify and furthermore forestall spillage of LPG. This framework gives location of gas leakage, checking and control arrangement of LPG spillage which take care of every single such issue.

The objectives of this system are:

a) Detect the gas leakage using MQ6 sensor send message to user on android application using IoT.

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b) Monitor the home temperature and fire, buzzer will on when temperature exceed above threshold value.
c) Automatically controlling of gas leakage using relay. All such status i.e. temperature above threshold value, gas leakage detected is shown on android application of mobile user.

## II. RELATED WORKS

In literature, the problem and the previous techniques of gas detection is described.
A cost-effective, p automatic Liquefied Petroleum Gas (LPG) Programmed Liquefied Petroleum Gas (LPG) booking, spillage location and continuous gas checking framework is proposed in this paper. In this framework, the LPG spillage is distinguished through the sensor and data is sent to the client by Short Message Service (SMS) and at the same time cautions the client utilizing a GSM module, while initiating the alert and fumes fan. The extra preferred standpoint of the framework is that it ceaselessly screens the level of the LPG introduce in the chamber utilizing weight sensor and naturally books the barrel utilizing a GSM module[1]. The framework distinguishes the spillage of the LPG and cautions the buyer about the release and as a crisis measure the framework will switch on the fumes fan and furthermore checks the spillage. An additional element of the framework is that the rough utilization is shown as far as the aggregate weight. The proposed framework makes utilization of GSM module so as to caution about the gas spillage by means of a SMS. The fumes fan is exchanged on and a LPG safe solenoid valve fitted to the chamber is given a flag to close maintaining a strategic distance from assist spillage. The gadget guarantees wellbeing and forestalls suffocation and blast because of gas spillage [2]. The previous frameworks cannot respond in time, even can't acquire information from a mishap and find precisely. This framework gives continuous criminologist of potential hazard territory, gather the information of hole mischance and find spillage point. This framework having insurance hardware comprises of fumes fan and a Liquefied Petroleum Gas Safe Solenoid Valve. On the off chance that these gasses surpass typical level at that point alert is produced quickly. In this framework MQ-6 gas sensor used to detect harmful gas and has high affectability to LPG and furthermore reaction to flammable gas. This work adjusts the current security show introduced in businesses. It offers fast reaction time and exact discovery [3]. Safety assumes a noteworthy part in this day and age and it is essential that great wellbeing frameworks are to be actualized in spots of training and work. This work adjusts the current wellbeing model introduced in businesses and this framework likewise be utilized as a part of homes and workplaces. The unsafe gasses like LPG and propane were detected and shown every single second in the LCD show. On the off chance that these gasses surpass the ordinary level then a caution is produced instantly and furthermore a ready message (SMS) is sent to the approved individual through the GSM. The upside of this robotized identification and cautioning framework over the manual technique is that it offers brisk reaction time and exact discovery of a crisis and thus driving quicker dispersion of the basic circumstance [4]. The framework recognizes the spillage of the LPG utilizing gas sensor and cautions the buyer about the gas spillage by sending SMS. The proposed framework utilizes the GSM to caution the individual about the gas spillage by means of SMS. At the point when the framework identifies the LPG fixation noticeable all around surpasses the specific level then it instantly caution the customer by sending SMS to determined cell phone and alarm the general population at home by initiating the alert which incorporates the LED, Buzzer at the same time and show the message on LCD show to make the important move and switch on the fumes fan to diminish the gas focus noticeable all around. [5]Gas spillage is a noteworthy worry with private, business premises and gas controlled transportation vehicles. One of the preventive measures to stay away from the threat related with gas spillage is to introduce a gas spillage indicator at powerless areas. The goal of this work is to exhibit the plan of a practical programmed disturbing framework, which can distinguish melted oil gas spillage in different premises. Test outcomes are shown for a USB controlled gas spillage recognition framework and it gives early cautioning signals under less serious conditions and enacts a sharp alert in the event of crisis circumstances to protect the clients. [6]

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## III. PROPOSED ARCHITECTURE

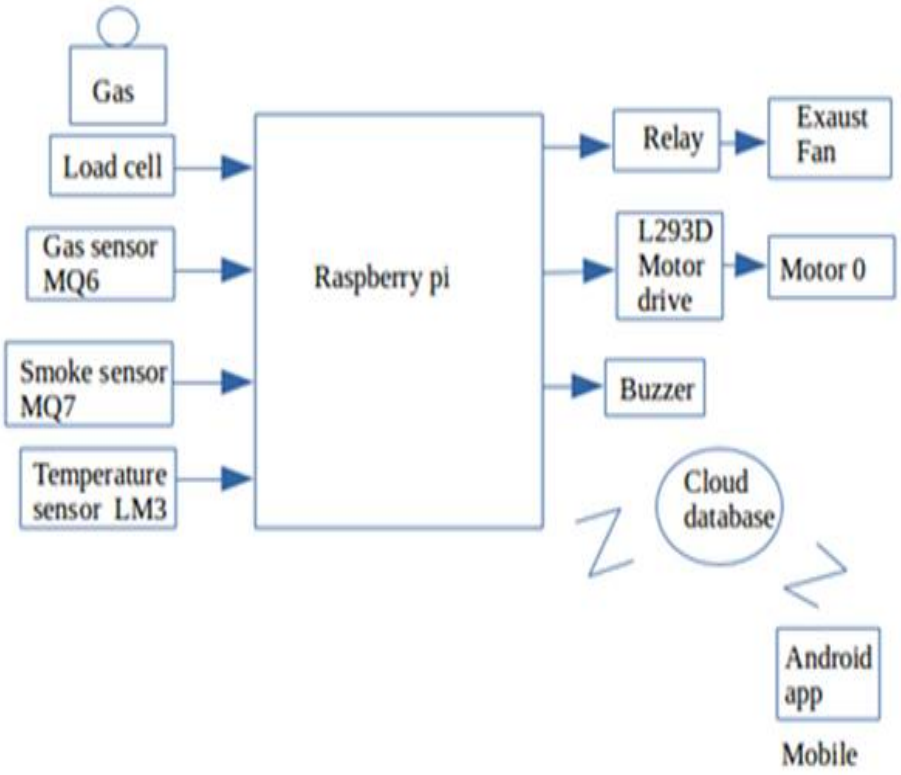


Fig.1. Block Diagram of proposed system

The above fig shows the block diagram for LPG Level Monitoring, Booking & Gas Leakage Detector. The gas sensor MQ-6 is very sensitive to methane and propane which are main constituents of LPG. A load cell is used to measure the weight of cylinder continuously. The weight of cylinder is displayed continuously and some 4-5 MQ-6 sensors will be placed in different place of room, output of sensor will become high when there is LPG leakage is present. When temperature exceed above threshold then automatically buzzer will on and exhaust fan will automatically on. When the weight of cylinder equal to threshold value, message will show on android application that the cylinder is going to empty now.

## IV. SYSTEM ALGORITHM

We propose an algorithm to describe the operation of the system.

### a. ALGORITHM

Below is the algorithm of the proposed system

Step 1 Initialize the system.
Step 2 Gather data from all three sensors.
Step 3 Is weight greater than threshold? If no then notified cylinder's status as cylinder is empty on app.
Step 4 Is gas sensor detects LPG? If yes then notified this on app and on motor to close gas valve.
Step 5 Is temperature is greater than threshold value? If yes then ON buzzer and exhaust fan.
Step 6 Display current value of temperature and weight of cylinder on webpage.
Step 7 Stop.

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**b. FLOW CHART**

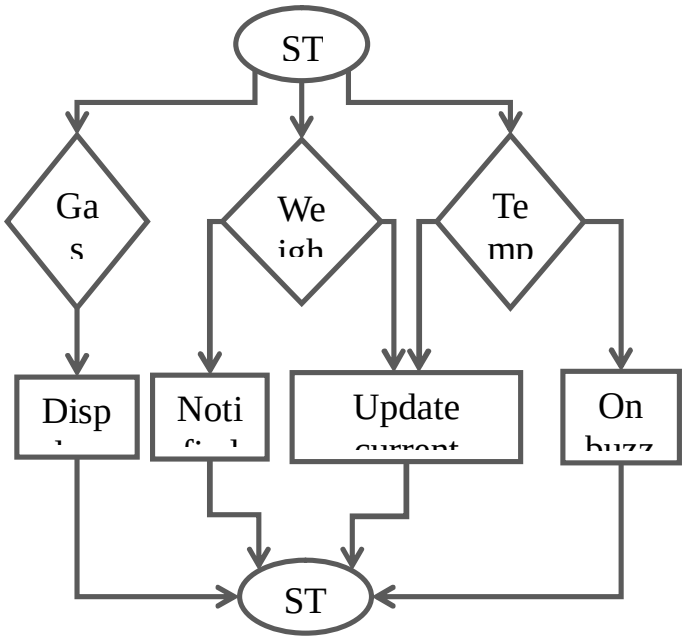


Fig 2 Flow of system operation

Values of temperature and gas sensor are continuously updated on webpage. If temperature exceeds threshold value then the exhaust fan will be ON. Weight of threshold is less than threshold means cylinder is empty and it's status is convey to user by updating it on webpage and notify on android app. The increase value of gas sensor shows the leakage of gas and it should be stop for that the motor connected to valve is on to close the valve and stop leaking.

## II. RESULT

**a. HARDWARE MODEL**

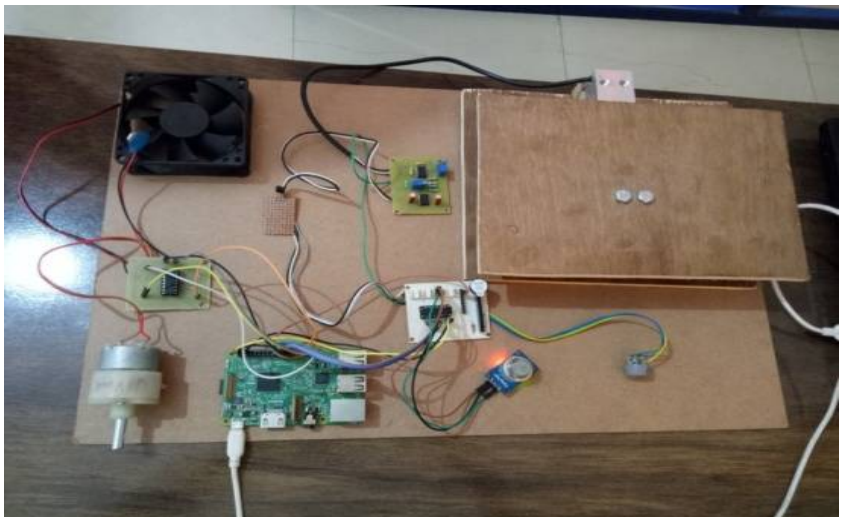

Fig 3Hardware model of the system

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Figure 6.1 shows the actual hardware model of the proposed system which consists of the Raspberry pi as main controller, gas sensor for detecting LPG gas, motor driver IC for driving motor to close the gas valve when it start leaking. It also consists of the exhaust fan when temperature goes high it will be ON.

**b. WEB PAGE**

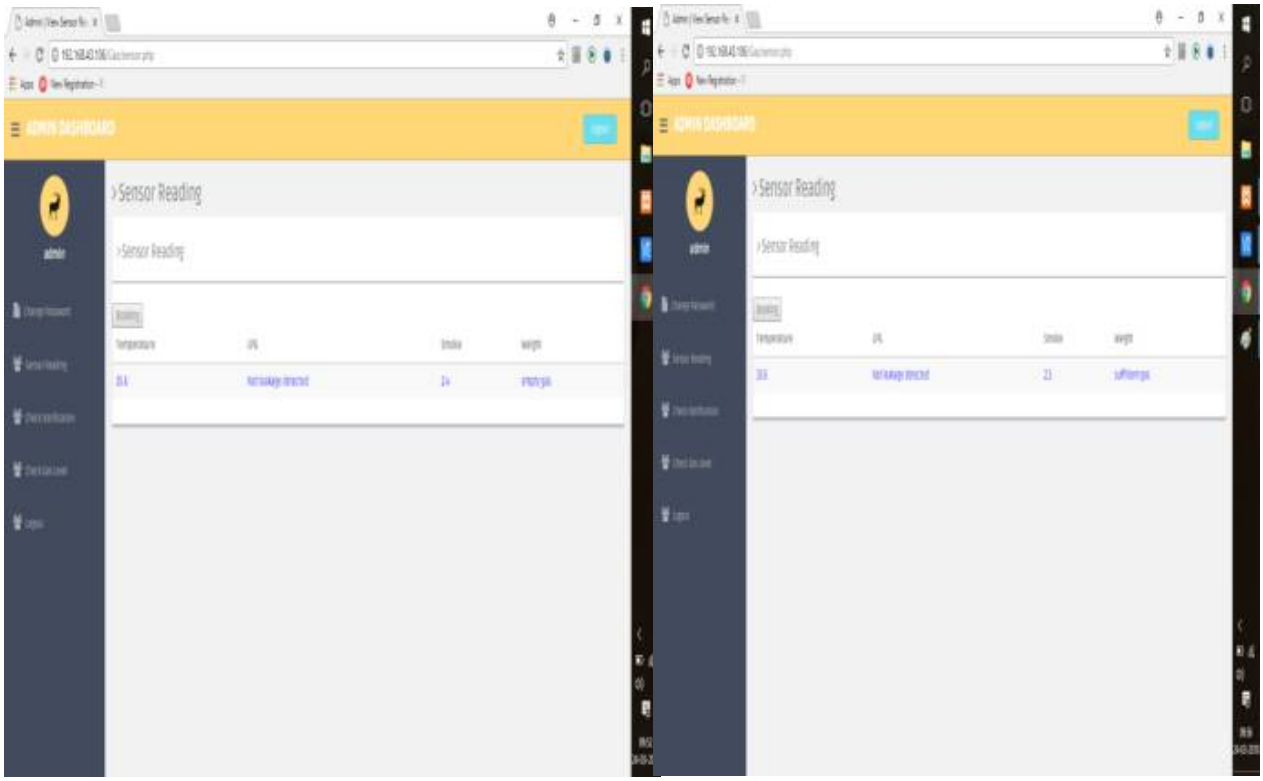


Fig 4 webpage shows sensor readings

Fig 4 shows webpage of the gas detection system. The entitled sensor reading shows temperature reading, LPG gas detection status, smoke and weight of gas cylinder. This webpage also provides different services as change password, check notifications, sensor reading and logout etc.

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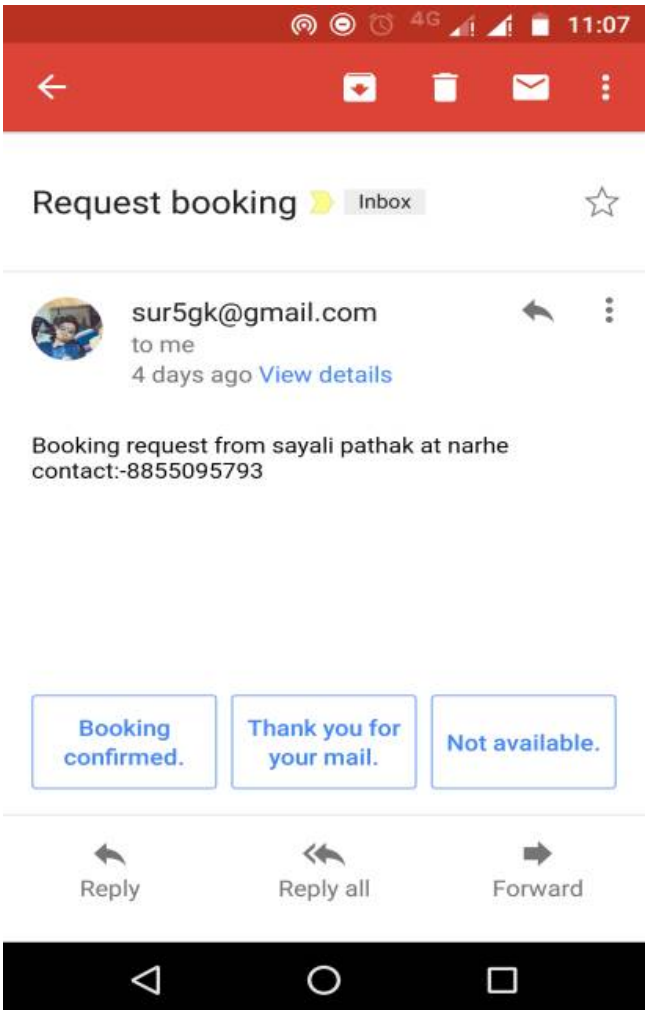


Fig 6.4: login page and status of App.

## III. ANALYSIS: GRAPH AND TABLE

Table 6.1 table showing comparison between existing and proposed system

| Parameters | Existing system | Proposed system |
|---|---|---|
| Speed (GHZ) | 0.060 | 1.2 |
| RAM (MB) | 0.040 | 900 |
| Architecture (bit) | 32 | 64 |
| Operating voltage (volt) | 3.6 | 5 |

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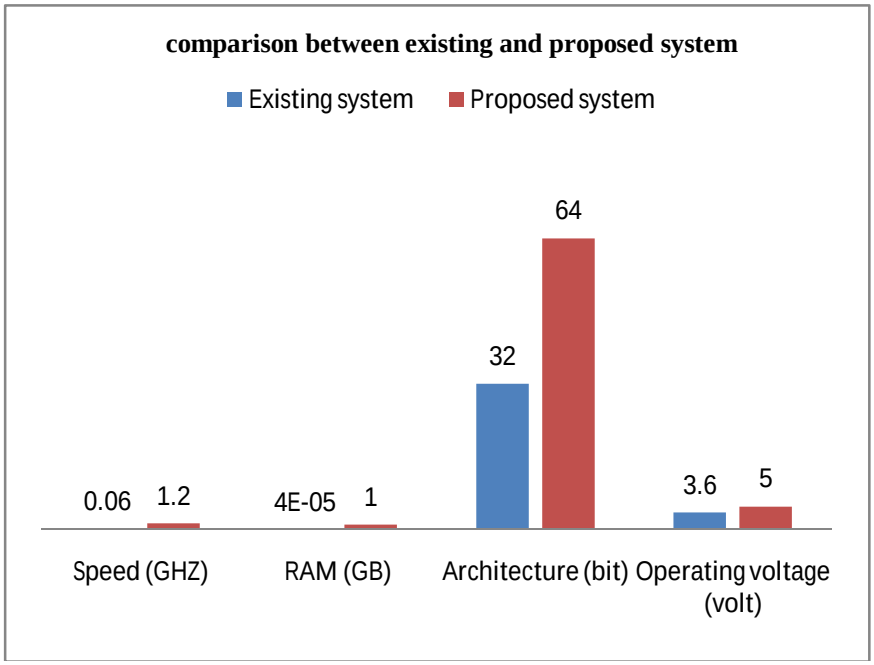


## IV. CONCLUSION

The gas indicator framework actualized met certain great conditions, for example, minimal effort, tremendous application, plan economy, accessibility of parts (privately sourced) and explore materials, efficiency, compatibility, portability and also durability The execution of the undertaking after test, met design specifications. Us the system is very accurately define the leakage of the system. Advantages of this system over existing system are the sensor has excellent sensitivity combined with a quick response time and it easily monitor gas leakage and surrounding temperature using sensors.

The system is best suited for the application related to gas leakage detection but suffers from some drawbacks like its sensitivity depends on Humidity and temperature and it will not operate unless and until you didn't provide 5V supply to the system. Protection from any gas leakage in cars, for safety from gas leakage in heating gas fired appliances like boilers, domestic water heaters, for safety from gas leakage in Cooking gas fired appliances like ovens, stoves etc Large industries which uses gas as their production., gas leakage detecting equipments in family, Car and industry, are suitable for detecting of LPG, isobutane, propane, LNG, avoid the noise of alcohol and cooking fumes and cigarette smoke are some applications of this system.

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