

Automatic Gas Booking Using IoT with Notification

Sreenivasa Setty¹, Arcot Prashanth², Karanam Ramyasree³, Kishan Bhat⁴, Nikhita Arun^{5*}

¹Associate Professor, Department of Information Science and Engineering, Dayananda Sagar Academy of Technology and Management, Bengaluru, India

^{2,3,4,5}Student, Department of Information Science and Engineering, Dayananda Sagar Academy of Technology and Management, Bengaluru, India

Abstract: The problem of gas leaking and fire occurs frequently in our daily lives. Liquefied Petroleum Gas, or LPG, is a highly flammable gas that is used to power heating appliances. The risk of a structure fire, asphyxia, or explosion increases if this gas leaks. Because the use of LPG is increasing every day, the booking process is inefficient. Because of the enormous number of booking requests, the system is unable to register and respond to each one. This project is concerned about these challenges and adds to its efficacy. If the gas level falls below the fixed figure, a notification is delivered to the phone, and the gas agency is notified to record the booking after customer confirmation. The initiative also safeguards the safety of those who work near the cylinder by detecting any gas leaks and fires. A buzzer will sound if any of these are identified. This will also be communicated to the user and the gas agency.

Keywords: Internet-of-Things (IoT), Fire sensor, Gas sensor, Load cell, GSM module, LCD module, Weight sensor.

1. Introduction

The gas cylinder in your home for cooking can run out at any time. If you don't have an additional cylinder at home, this can cause a lot of problems. Booking a cylinder and receiving confirmation from the gas agency will take days at that time. As a result, it's important to keep an eye on the LPG level in the cylinder and be alerted when it drops below a certain level. As a result, this effort is aimed at achieving the same goal. This project also sends direct booking notifications with the customer ID to the gas agency. As a result, prior to the conclusion of the old LPG cylinder, a new booking will be made automatically.

The IoT-based gas level detection and automatic booking notification project was proposed in order to save people's time and lives. LPG is a byproduct of the petroleum production process. LPG is utilized as a fuel in a variety of applications. The provision of LPG through pipes is not practicable in India due to a shortage of LPG production, as it is in other industries such as cooking and welding. The use of LPG is steadily expanding. Booking an LPG cylinder these days is a risky business. When we approach a gas agency, it is possible that the call will not be connected or that the booking will not be logged. It is quite difficult to reserve a new cylinder, and it is extremely dangerous when an LPG gas leak happens in any domestic, chemical, or other application. This study proposes automatic

cylinder booking and a solution to the problem of LPG leakage.

In everyday life, gas is quite vital. Due to their hectic schedules, people frequently neglect to reserve a gas cylinder. This endeavour is extremely beneficial to them. In addition, if the user does not recognise gas leakage in time, he or she will be compelled to inhale a substantial volume of gas, causing health problems and, in the worst-case scenario, death if in a closed room. Furthermore, if gas is leaked in a location that is exposed to combustible substances or minor sparks, the risk of fire is very significant. This paper is an effective and positive way of monitoring the gas quantity in the container, as well as informing and placing a refill order at the appropriate business unit (gas agency), via an internet message via IoT module.

2. Literature Survey

[1] The proposed system has been built and implemented successfully. It is not realistic for a person to spend time manually booking in current fast-paced technology when technology may be employed to perform chores. As a result, booking gas with IOT is simple and straightforward. They're employing a variety of sensors in this project. Each sensor will perform its function in a unique way, making it simple to detect and improve performance. Instead of a load cell, a pressure sensor can also be used to monitor the amount of gas in the cylinder and the pressure in the cylinder pipe. When the concentration exceeds a certain threshold, the user is warned and asked to take the necessary actions. For this, they employed the ubidots IOT platform. Ubidots are connected to the hardware, and the data acquired by the device is transmitted to it.

[2] Because gas leaks are a severe problem in residences and other places where domestic gas is used, this proposed gas leakage detection and monitoring system was created. The paper's major goal is to show a new system that automatically books a cylinder when it is about to run out of gas by sending a notification to the gas agency through WIFI using an Internet of Things method. The secondary goal is to determine the weight of the remaining gas in the cylinder, which can be accomplished with the help of a weight sensor. As a result, the proposed solution aids LPG gas users in leading to safe environment. Because the Internet of Things is so useful for

*Corresponding author: nikhitaarun04@gmail.com

automating jobs, it may also be used to improve convenient safety practises. LPG, which was first introduced by Dr. Walter Snelling, is most widely used for cooking. Most disasters occur in the house or in industry as a result of gas leaks, which cause numerous accidents and even human deaths. The proposed gas leakage detection and monitoring system is built and presented in this study to deal with such a situation.

[3] Now-a-days, technology has improved to the point where any task can be completed quickly and effortlessly. This Internet of Things project is for automatic gas booking. Many domestic accidents occur because people are unaware that there is a gas leak. This effort is also intended to reduce the number of accidents caused by LPG gas leaks. When there is a leak of LPG gas, the concentration rises, which is displayed on ubidots. As a result, an indication is utilised to signify this, and a user alert message is delivered. To send messages, this system does not use GSM or Bluetooth modules. When there is a gas leak, it raises an alarm and sends a message to the user, as well as turning off the main power supply. The microcontroller is connected to all of the devices. The level of gas inside the cylinder is continuously displayed on the LCD display. The user is notified of the gas leak even if he does not have an internet connection on his phone; all that is required is that Wifi be provided to the Node MCU, to which all sensors are attached. This system is simple to set up and utilize.

[4] The suggested topic "IOT (Internet of Things) based Smart Gas Management System" addresses three primary issues: gas leakage detection, fire detection, and gas cylinder automatic booking. To detect gas leakage, fire, and continuously monitor the volume of gas in the cylinder, this system uses a gas sensor, a fire sensor, and a load cell. The microcontroller utilized in this project is the Arduino UNO. It has all of the input devices, such as a gas sensor, a fire sensor, and a load cell, as well as output devices, such as a buzzer and an LCD display. When a SIM card is inserted into a GSM Module, it can make phone calls and transmit AT-coded SMS messages. The Voice Module is used to record speech-based alarm messages. When a disaster occurs, a call is placed to the registered mobile phone number, and the recorded speech is played again as soon as the call is received. Every module's outcome can be examined on an LCD display. If a gas leak or wastage is discovered, the buzzer begins to beep. As a result, by utilizing an IOT-based Smart Gas Management System, the damages caused by gas leakage can be reduced.

[5] The majority of civilizations have fire safety mechanisms in place. However, it can be used after the fire has been extinguished. To gain control over such circumstances, they have proposed a system that employs sensors capable of detecting gases such as LPG, CO₂, CO, and CH₄. Not only will this system be able to detect gas leaks, but it will also be able to alert users via audible alarms. If there are excessive concentrations of dangerous gases in the environment, this system will alert the user. The system might send a message to the society administrator informing them of the situation. Gas detector sensors, an Arduino board, an ESP8266, and a cloud server make up the system. All flat member users can be registered in our system by a single Society authority person.

The society administrator can add information about each flat user, such as their name, phone number, and flat sensor information. Each sensor's threshold value can be set by society administrators.

Each flat can have system hardware installed. The value per time can be sensed using sensors. The values can be sent to the cloud server by the system. The sensor values can be compared to the threshold value by the server. The server can send a command to the hardware to buzz the alarm if the sensor value exceeds the limit. The server also sends the user a notice message. This project employs IoT technology to create a Gas Leakage Detector for society that includes Smart Alerting strategies such as sending text messages to the appropriate authorities and the capacity to perform data analytics on sensor data. Using gas sensors, this system will be able to detect gas in the environment. This will avoid serious problems.

[6] This paper describes an automated system for detecting and monitoring gas leaks, as well as checking the gas level in the container. This system is used to keep track of gas leaks, cylinder load, and gas Knob status. It detects gas leaks with the help of a gas sensor (MQ2).. This sensor detects flammable gases and smoke and activates the buzzer to inform the user. Load cell is used to determine the weight of the gas cylinder. It's a type of transducer that generates an electrical signal with a magnitude proportionate to the force being measured. The IR sensor detects the status of the gas knob. It's a type of electrical sensor that detects infrared light emitted by objects in its range of vision. If the Gas Knob is in the Switch on state, it will send an SMS alert to the user. The proposed system has applications in both home and industrial safety. This system will detect gas leaks and, by activating the buzzer, will notify the owner of the leak. In this the system continuously monitors the weight of the gas cylinder, identifies the status of the gas knob, and shows on LCD and sends SMS to users if the knob is ON in the absence of fire. Future work could include providing automated leak detection when the Gas knob is turned on, as well as when the container is empty.

[7] Gas is frequently utilized in modern life, particularly LPG gas, which is commonly used in houses, restaurants, and industries. Furthermore, if gas is released in an area containing flammable elements, the risk of fire is very significant. The Internet of Things (IoT) has seen a lot of use in recent years, and it has a lot of practical uses in human life. The detection of gas leaks is one of the applications. This paper proposes a Proteus-based system that is designed and simulated. When the device is turned on, the initial settings and script are set to aid communication between the modules. The sensor value is updated and interpreted to % displayed on the second line of the LCD, and "Gas Scan is ON" is displayed on the first line of the LCD. It turns on the red light, sound the buzzer, and displays "Gas is Detected!!!" if the gas level is greater than 20%. And turns off the red light and buzzer, and displays "Safe Area" if the gas level is less than or equal to 20%. When there is no gas leak, the sensor's value is constantly updated. Every 15 seconds, the collected data will be uploaded to thingspeak.com.

[8] Safety and time are major concerns. These difficulties are addressed in this project. We all know that booking gas is a

time-consuming process, and there is also the risk of gas leakage. The majority of the accidents are caused by gas leaks. This project allows us to detect gas leaks, control them, and book gas without the use of a human interface. Internet booking is a type of interaction that lasts only a few seconds and needs some knowledge of the Internet. The majority of clients are unable to determine the amount of LPG gas present in the chamber. As a result, the reservation is not completed on time, and the client is forced to wait for another chamber, which is inconvenient for the client. By adopting this service, they are assisting people in saving time by allowing them to book gas automatically. It can offer individuals with security by detecting gas leaks. Because they utilised the C programming language, the programming for this project is quite straightforward and easy to understand. This system's ease of use makes the project user-friendly.

3. Conclusion

By implementing this technology, people will be able to save time by having automatic gas reservations. It can offer individuals with security by detecting gas leaks. It can be used for both residential and industrial purposes. Because we used the C programming language, the programming in this project is quite straightforward and easy to understand. This system's ease of use makes the project user-friendly. The proposed system can be further developed by detecting gas leaks and fires. For controlling and monitoring the weight of the LPG cylinder, a mobile application can be developed. When a fire accident occurs, the water mist system can be installed, and the suggested system can also notify the GPS location of the fire accident to the fire station as an emergency.

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