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Smart Lpg Level Monitoring And Automatic Booking System Integrated With Trolley

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MQ2 sensor,

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ABSTRACT

These days, the most used fuel for cooking is an LPG gas cylinder. Since 2016, the Indian government has helped 50 million women living in poverty under the Pradhan Mantri Ujjwala Yojana. LPG cooking produces less carbon dioxide as compared to the previous practical method. Propane, butane, propylene, butylene, and isobutane are all mixed together to form LPG. The Ministry of Petroleum and Natural Gas conducted a poll that estimates 99.8% of Indians will have access to LPG in 2021–2022. These technologies are designed to decrease cooking downtime and eliminate the need for a human interface when booking an LPG gas cylinder. Using a MQ2 sensor, it is also utilised to find gas leaks in the surrounding area. It also boosts output and provides assistance.

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INTRODUCTION

In today's world not a single sector is left which is untouched by technological evolution. Since the IOT has become one of the most preferred technologies for implementation. LPG Gas cylinder is the most used fuel for cooking replacing the convenient methods such as by woods and oil. These systems focus on making the system more economical and environment friendly for consumers for day to day usage. Many LPG Gas agencies are being established for providing the LPG cylinder at consumers doorstep. In this paper we are focusing on making these systems more effective in usage. We are connecting a Load Cell of approximately 40 KG below the trolley on which the LPG Cylinder is placed. The Gross weight of a full cylinder is 30.5 Kg and empty cylinder is 14.5 Kg. The Load cell is connected with an HX711 amplifier which amplifies the Load cell output values digitally. The structure of paper works with the help of a microcontroller based system. The monitoring of LPG gas cylinder is done with the help of LCD 16*2 Display. The Display shows the real time reading and the actual weight of

the LPG cylinder. A Buzzer is also interfaced with the microcontroller board just for indication purposes in case of emergency

A MQ2 sensor is being interfaced with the microcontroller just in case of Gas leakage. As the LPG Gas is hazardous and inflammable so to avoid the accidents the MQ2 sensor is placed for security reasons. If some amount of Gas is leaked then the microcontroller gives a signal to the buzzer A GSM module is the foremost component of this system.

Once the weight of the LPG cylinder is below the prescribed limit then the Microcontroller sends the message to the GSM module. Then a notification is displayed on the mobile phone of the consumer. A Cellular phone receives the SMS and just by simply placing the message to the regarding LPG gas agency we can book a LPG gas cylinder

LITERATURE SURVEY

Smart LPG monitoring and automatic booking systems integrated with trolleys are becoming increasingly popular due to the convenience they offer to both customers and LPG distributors. This paper proposes a smart LPG gas booking and monitoring system that is designed to automate the LPG booking process and monitor the gas level in the cylinder [1]

The system uses an ultrasonic sensor to measure the gas level and sends this information to a microcontroller, which then sends an SMS to the customer when the gas level is low. The system also includes a web application for online booking and monitoring of the gas level [2]

This paper presents an IoT-based smart LPG gas cylinder monitoring system that uses a gas sensor to measure the gas level in the cylinder and sends this information to a cloud server [3-6].

The system includes a mobile application that allows customers to monitor the gas level and place orders for refilling the cylinder. The system also includes a trolley that can be used to transport the cylinder, making it convenient for customers [7-10]

This paper proposes a smart LPG gas booking system using lot that is designed to automate the LPG booking process and provide real-time information about the gas level in the cylinder [10-11].

The system users an ultrasonic server to measure the gas level and sends this information to a microcontroller, which then sends an SMS to the customer when the gas level is low[12-13]

The system also includes a web application for online booking and monitoring of the gas level [14-16]

THE OBJECTIVE OF THIS PAPER IS

1. Efficiency Improvement: Enhance the efficiency of the LPG distribution system by implementing a smart monitoring and booking system.
2. Automation: Introduce automation in the LPG

3. industry to reduce manual processes and increase overall system efficiency.
4. User Convenience: Improve user experience a convenient and user-friendly platform for monitoring LPG levels and making automatic bookings.
5. Safety Enhancement: Implement safety measures through advanced monitoring technologies to ensure the secure handling of LPG

PROPOSED METHODOLOGY

Fig. 1: Block Diagram

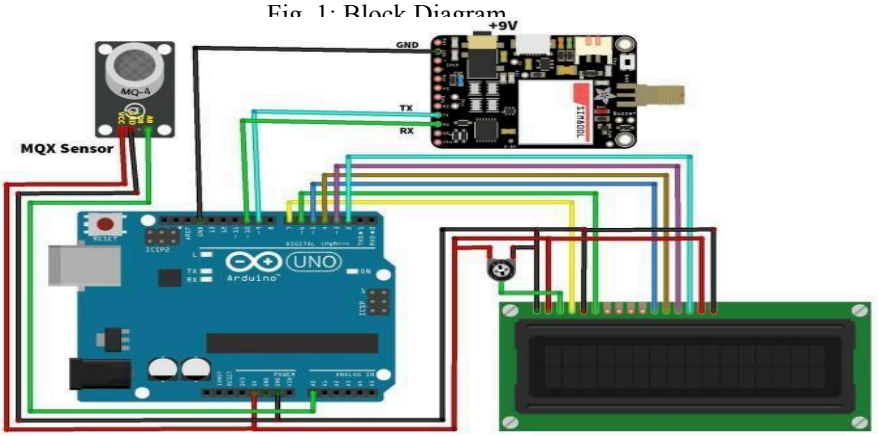

Fig. 2: Circuit Diagram

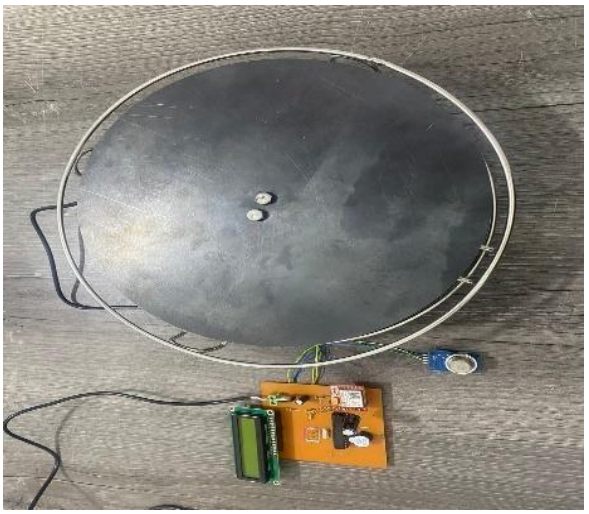

Fig. 3: Model

Fig. 4: Model

Designing a smart LPG monitoring system with an integrated automatic booking system linked to a trolley requires a meticulous approach blending both technological and user-centric considerations. A mixed-method research strategy would be ideal for this endeavor. Initially, qualitative research methods such as interviews, focus groups, and ethnographic studies can help in understanding the needs and behaviors of potential users, including both consumers and retailers. This qualitative phase would uncover insights into user preferences, pain points in the current LPG delivery and booking process, as well as the challenges faced by retailers in managing their inventory and deliveries efficiently.

Following this, quantitative research methods can be employed to gather data on the technical aspects of the system. This may involve surveys to assess the level of technological literacy among potential users, as well as their willingness to adopt such a system. Additionally, data analytics techniques can be applied to existing datasets to identify patterns in LPG consumption, delivery schedules, and peak demand periods.

In parallel, prototype testing and iterative design methodologies should be employed to develop a working model of the integrated system. This would involve creating prototypes of the monitoring device, booking interface, and trolley integration mechanism, and testing them in real-world scenarios with a select group of users. Feedback collected during these tests can then be used to refine and improve the system iteratively.

EXPERIMENTAL RESULTS

Performance Table

Performance Metric	Description
Accuracy of Monitoring	Percentage of accurate readings provided by the gas monitoring system, ensuring precise tracking of LPG levels.
Reliability of Booking System	Percentage of successful bookings made without errors or system failures, ensuring timely and efficient deliveries.
Response Time	Average time taken for the system to respond to user requests, including gas level updates and booking confirmations.

User Satisfaction	User feedback scores indicating satisfaction with the system's ease of use, reliability, and overall performance.
Inventory Management	Efficiency of the system in managing retailer inventory, minimizing stockouts, and optimizing delivery schedules.
Integration with Trolley	Smoothness and reliability of the integration between the gas monitoring system and the trolley for seamless operation.

CONCLUSION

Smart LPG Level Monitoring and Automatic Booking system integrated with trolleys can provide i tany benefits to both consumers and LPG suppliers. This system can enhance safety and convenience of LPG usage by eliminating the need for physical visits to the dealer and provide real time information on LPG level. The trolley can offer convenience to transport the LPG cylinder Overall the system improves the efficiency and usage of LPG exfinder in a mote sustainable and safer environment.

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