

Automated Gas Booking Using IoT

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Abstract - This paper is about the most common problem experienced in our day-to-day lives that is regarding gas container going empty. We bring this paper to create awareness about the reducing weight of the gas in the container, and to place a gas cylinder order using IoT. The gas booking/order is being done with the help of IoT and that the continuous weight measurement is done using a load cell which is interfaced with a ESP32 microcontroller. Our idea deals with the continuous monitoring of gas cylinder and automatic booking of gas cylinder. We use IoT platform to transfer data to our android application and to notify the user about the current status of the system. The continuous monitoring of surrounding will be done using MQ-5 sensor for any gas leakage and will be informed to the user if found any. The booking of gas cylinder will be done using the android application.

1. INTRODUCTION

We are developing an efficient way of continuously Monitoring of gas level in gas cylinder and update the user by using IoT. Here the order for the new gas cylinder is automatically placed by system. It will also detects any gas leakage.

Our project is about the continuously monitoring of gas level in gas cylinder using IoT, automatic booking of gas cylinder and monitoring surrounding for any leakage. Our project eliminates the manual approach followed currently, hence there is no need for the user to call the dealer and book the gas, and also aged people are finding it difficult to book the gas using current IVRS technology. We're using the ESP32 which acts as the microcontroller, these microcontroller has the built in Wi-Fi module. It takes the input data from all the different sensors and send it to the cloud platform. The cloud platform used is Thingspeak which is used to store the data from each sensor. Also we will be making application for the user to know the exact amount of gas remaining and to book the gas cylinder automatically.

2. BASIC BLOCK DIAGRAM

In these project we are having the Load cell, MQ-5 gas leakage sensor. The gas sensors are placed near the stove and one near the gas cylinder to detect any leakage. The load cell is used to measure the weight of the gas cylinder to determine the amount of gas remaining in the gas cylinder.

The node mcu is enclosed in safe enclosure to avoid any tempering. The node mcu is connected to the internet through the local gateway. The data collected from the various sensors are sent to the cloud platform (Thingspeak).

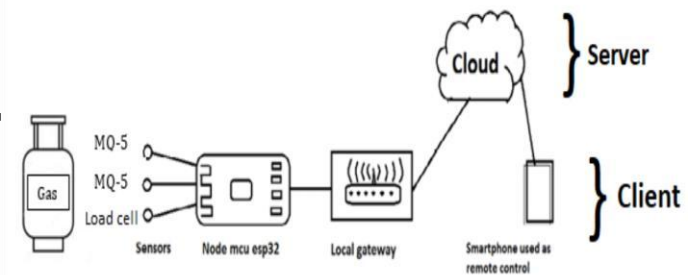


Fig 1: Basic Block Diagram

These data from the cloud platform will be displayed onto the mobile application on the user's smartphone. The extracted data will be sent to the cloud platform and the mobile application with the date and time.

If the gas level falls below the specified threshold then the user will be alerted and the prompt will be sent on to the mobile application. If the user wants to book the gas cylinder he can accept the prompt or if the user wants to book the gas cylinder later user may decline the prompt.

3. INTERNET OF THINGS

We are using the thingspeak cloud platform to store all the Leakage and Weight data form the sensors.

The graphs shows the updated value for any changes in the LPG gas leakage and Weight of LPG cylinder.

The below graph (Fig 2) show the value of gas sensor which sense any gas leakage near the gas container, it keeps on sensing continuously .if any change is noticed then it updates the value over the IoT.



Fig 2: LEAKAGE OF GAS CYLINDER OVER TIME GRAPH

The graph below (Fig 3) shows the status of the weight sensor which measures the weight of the Gas Cylinder. This Weight is used to determine the amount of liquefied Gas present in the Gas container. The sensor continuously sense the weight and values are updated over the IoT. When the user consumes the gas above 70% than the user will be prompted with the notification, reminding the user to book the gas.



Fig 3: VARIATION OF WEIGHT OVER TIME GRAPH

4. APPLICATION

DESIGN 4.1FLOW

DIAGRAM

Mobile application is developed using android studio. We have use java for application coding. Application is connected to thingspeak cloud service. ESP32 is sending the received data from sensors to the Thingspeak.

Whenever the user will open the app or whenever user logs in, the app will display real-time database readings.

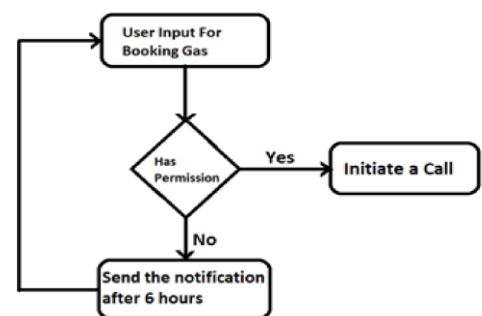


Fig 4: THE PROCESS OF GAS CYLINDER BOOKING

When the Gas level falls below the set threshold value the user will get an alert notification whether he wants to book a gas cylinder or not. If the user press yes then call will be initiated to book the gas cylinder and if the user press no then the booking notification will be sent again to the user after sometime. This is the first activity that customers will login in order to access the account. We have included Google login in our application for user convenience by which customer can login using their email id's. We have developed this application for the gas booking of the cylinder and to alert the user about any leakage present. In order to login into the mobile app user has to login with their Google account.

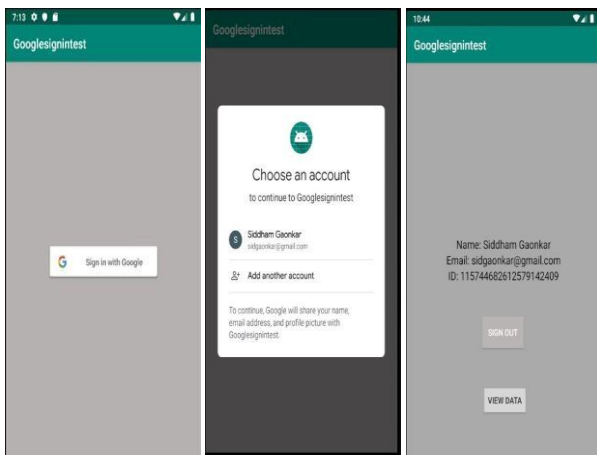


Fig 5: LOGIN PAGE

4.2 FETCHING DATA ON MOBILE APP

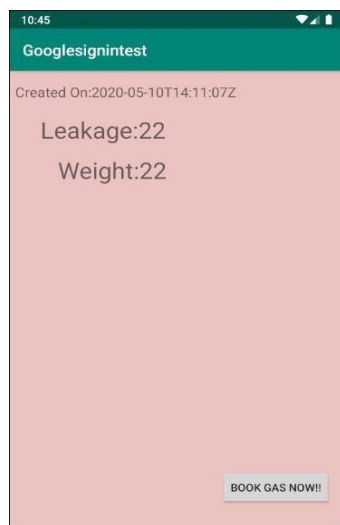


Fig 6: FETCHING DATA

The data from the cloud platform is displayed on the mobile application. Here both the GAS leakage and Weight of the GAS container is displayed and updated continuously. If there is any leakage found or the weight of the Gas container falls below the set threshold the user will be notified about the same so they can take proper action.

4.3 ALERTING USER

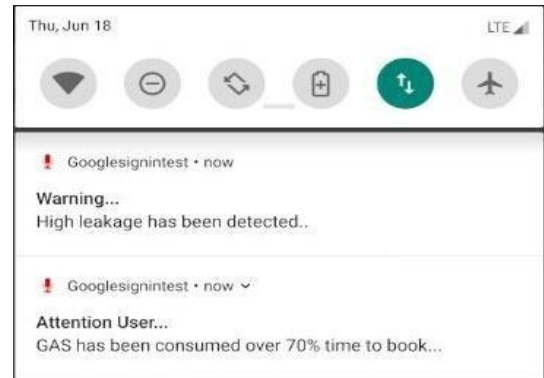


Fig 7: ALERTING USER

To update users we have made use of notifications, if leakage is present and the value crosses the threshold value, notification will be sent to the user. Similarly we have set the threshold value for weight, once the value crosses the threshold value, user will notified to book the gas cylinder.

4.4 AUTOMATIC GAS BOOKING

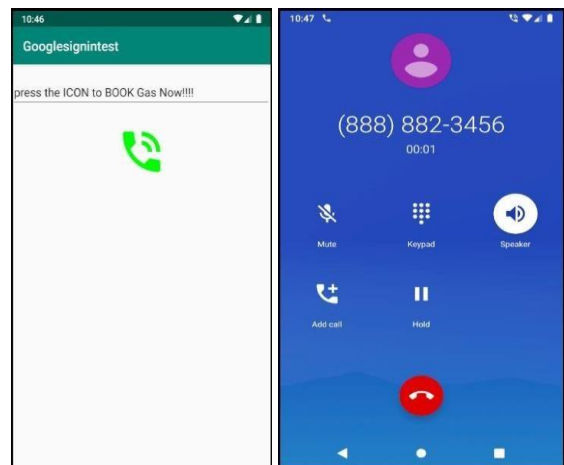


Fig 8: GAS BOOKING

Now if the user want to book the gas they have to click on the "book the gas button" then they will be navigated to the next activity where the user just have to click the Phone Icon to book the gas. When the user click the phone icon the app generates the call to the Gas agency number and the gas is automatically booked after some amount of delay without taking the user input.

5. CONCLUSION

We made model of our system with the node mcu and sensors. A code was written to interface the sensors to the microcontroller and the data was successfully sent to the thingspeak cloud platform with the time and date.

ACKNOWLEDGEMENT

It is our foremost duty to express our deep sense of gratitude and respect to Dr. J William Head of Department of Electronics and Communications for providing all necessary facilities to carry out project work and whose encouraging part has been a perpetual source of information.

We are deeply indebted to Prof.Laxmikant Bordekar for allowing us to carry out this project. The success and final outcome of this project required a lot of guidance and assistance from many people and we are extremely fortunate to have got this all along the completion of my project work. Whatever we have done is only due to such guidance and assistance.

We respect and thank our guide Ms.Pramila Volvoikar and co-guide Ms.Gauri Gaunekar for providing us support and guidance. Last but not the least we are thankful to our colleagues and those helped us directly or indirectly throughout this project work.

Special thanks to Dr.V.Mariappan principal of Agnel Institute of Technology and Design, library staff and everybody who contributed to project directly or indirectly.

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