

# SMART KITCHEN USING IOT

AKSHATA PAREKAR<sup>1</sup>, SONAL VISHWAKARMA<sup>2</sup>, POONAM BHALGE<sup>3</sup>, VEDANT PANDE<sup>4</sup>, PROF.KISHOR MAHALE<sup>5</sup>

Department of Information Technology,  
MET Bhujbal Knowledge City, AdgaonNashik -422003.

**Abstract:** Although much of the work has been done until today to realize the Internet of Things (IoT) into practice, most of the work focuses on resource constrained nodes, rather than linking the existing embedded systems to the IoT network. The Internet of things (IoTs) is a network of physical objects or things embedded with electronic, software, sensors and connectivity to enable objects to exchange data with manufacturers, operators and connected devices. It can be described as connecting everyday objects like smart phones, sensors and actuators to the Internet where the devices are intelligently linked together enabling new forms of communication between things and people, and between things themselves. IoT allows objects to be sensed and controlled remotely across existing network infrastructure. It also provides efficiency, accuracy, comfort and economic benefit. Now anyone, from anytime and anywhere can have connectivity for anything and it is expected that these connections will extend and create an entirely advanced dynamic network of IoTs. Our work here tries to enhance the Internet oriented approach with semantic oriented methods, both of which are required to build practical, complex IoT applications, which are expected on rich embedded devices.

**Keywords:** Gas sensor, load cell, Buzzer, motor, LCD display.

## INTRODUCTION

IoT has changed the life of human beings. Enormous increase in users of the Internet and modifications on the internetworking technologies enable networking of everyday objects. Each thing is uniquely identifiable through its embedded computing system within the internet infrastructure. Internet of Thing is all about physical items talking to each other, machine-to-machine communications and person-to-computer communications will be extended to things. We proposed the design and construction of an SMS based Gas Leakage Alert System. Gas sensors were used to detect gas leakages in a kitchen; its outputs are then interfaced with an NODE MCU microcontroller programmed in lua language. Gas is a leading source of energy used for heating and cooking purposes in our homes. The two major types of gas which serve these purposes are liquefied petroleum gas (LPG) and natural gas. This project aims at providing a safety assuring system that will detect the LPG leakage and the valve of the cylinder turns off automatically. The proposed system with its weighing sensor helps to measure the cylinder weight. Gas leakage detection is a method of identifying dangerous gases in the surrounding environment by the use of sensors, thereby leading to prevent further consequences. The ignition of these leaked gases may lead to explosion. The number of death reports caused by gas leakage explosions has been enlarged in recent years. The reason behind such explosions is mainly due to the old cylinder valves, drained out regulators, shortage of substandard cylinders, and lack of knowledge of using gas cylinders add to the danger. The main aim of the Internet of things is to make life easier by automating every task around us. Safety has been an important thing for designing homes, buildings, cities and Industries. Although the steps taken for this issue even though accidents are gradually increased due the leakage of gas. This Work is one step for avoiding fire accidents due Leakage of gas.

## AIM AND OBJECTIVES:

The main objective of the proposed Gas Leakage Detection and Automatic Control System is to provide a solution by designing an automatic system which can detect the leakage of liquefied petroleum gas (LPG) at home and control it by turning off the cylinder knob. Gas leakage occurs mainly due to poor maintenance of equipment and inadequate awareness of the people. LPG leakage detection is essential to prevent accidents and to save human lives.

## MOTIVATION:

The design of a gas leakage monitoring system is proposed for home safety. This system detects the leakage of the LPG and alerts the consumer about the leak by SMS and as an emergency measure the system will turn off the power supply, while activating the alarm. The additional advantage of the system is that it continuously monitors the level of the LPG present in the cylinder using load sensor and if the gas level reaches below the threshold limit of gas around 2kg. The device ensures safety and prevents suffocation and explosion due to gas leakage and software monitors all the functionality of software.

## SCOPE:

When things like household appliances are connected to a network, they can work together in cooperation to provide the ideal service as a whole, not as a collection of independently working devices. This is useful for many of the real-world applications and services, and one would for example apply it to build a smart residence.

## PROBLEM STATEMENT:

1. To detect the leakage of LPG systems.
2. By sending alert messages via mail, buzzer to alert users about gas leakage. Intelligent System for Domestic Gas Appliances using IoT. In our day-to-day life there is a serious threat of leakage which leads to suffocation when inhaled, when ignited leads to explosion and causes a number of deaths. This project is about designing an LPG leakage monitoring system which is proposed for

home safety. This system detects the leakage of the LPG and alerts the consumer about the leak by SMS and as an emergency measure the system. Gas leakage leads to various accidents resulting in both financial loss as well as human injuries. In human’s daily life, the environment gives the most significant impact to their health issues. The risk of firing, explosion, suffocation all are based on their physical properties such as flammability, toxicity etc. The number of deaths due to the explosion of a gas cylinder.

**LITERATURE SURVEY:**

Marjanrlevski, Biljanaristeskasrojkoska title of project IoT based system for detection for detection of gas leakage & house fire in smart kitchen paper of IEEE in 2019 In this paper we have designed a cheap internet of things-based system which enables the early detection of house fire and gas leaks.

Survyamandadi, Yashaswini C, Suraksha title of project IoT BASED SMART KITCHEN of paper IEEE in 2019 In this paper this system defines a method for safety by using five modules. The modules include a smart container gas leakage detection smoke, stove and a user interface.

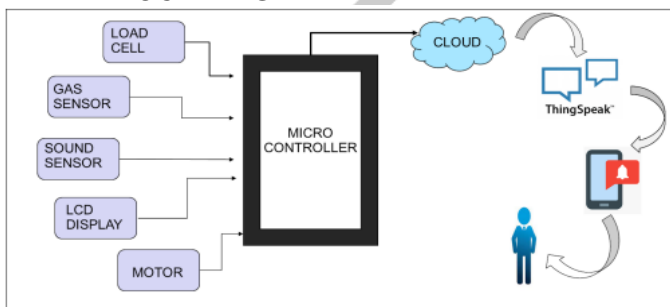
VarshaPalandurkar, SimranMascarenhas, Naaz D Nadaf title of project Smart Kitchen system Using IoT of paper IJERT in 2020 and the purpose of this project is to detect gas as part of the safety system. If there is LPG detection and alert will inform the authorized user about the gas leakage in order to prevent any harmful effect due to gas leakage. In the year 2017,

Kumar Keshamoni and SabbaniHemanth, “Smart Gas Level Monitoring, Booking & Gas Leakage Detector over IoT”. The main function of this system is whenever the gas leakage starts it has to provide an alarm sound in the kitchen and the live data is deployed in the cloud using WI-FI Module.

**1. DRAWBACKS OF EXISTING SYSTEM**

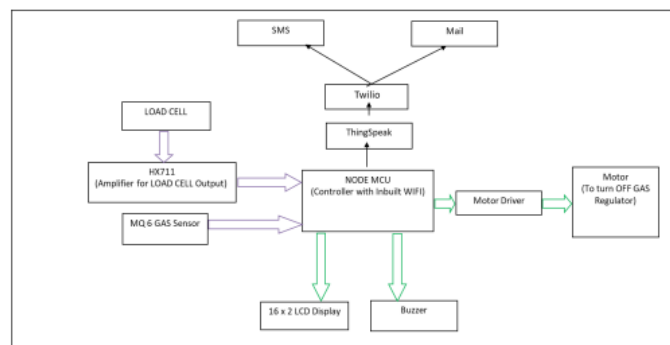
- **Less User Friendly:** The existing system is not user friendly because the retrieval of day-to-day activities data/records is very slow and records are not maintained efficiently and effectively.
- **Complex for generating the report:** We require more calculations and efforts to generate the report so it is generated at the end of the session. And the student does not get a chance to improve their attendance.
- **Lengthy time:** Every work is done manually so we cannot generate report in the middle of the session or as per the requirement because it is very time consuming.

**2. BLOCK DIAGRAM**



A block diagram is a diagram of a system in which the principal parts or functions are represented by blocks connected by lines that show the relationships of the blocks. They are heavily used in engineering in hardware design, electronic design, software design, and process flow diagrams. Block diagrams are typically used for higher level, less detailed descriptions that are intended to clarify overall concepts without concern for the details of implementation. Contrast this with the schematic diagrams and layout diagrams used in electrical engineering, which show the implementation details of electrical components and physical construction. A block diagram is a graphical representation of a system – it provides a functional view of a system. Block diagrams give us a better understanding of a system’s functions and help create interconnections within it. Here , All the hardware components are connected to microcontroller i.e. hardware components such as load cell with amplifier , gas sensor ,sound sensor, display and, motor to microcontroller i.e. node mcu esp32 . As node mcu has a feature of inbuilt wifi module through which the data is stored in cloud , then through api emergency notifications are sent to the user .

**SYSTEM ARCHITECTURE**



**Fig -1: System Architecture Diagram**

While LPG is important for each social unit, its leak may lead to a disaster. To alert on LPG leak and forestall any miss happening there square measure varied product to observe the leak. If a gas leak happens, this technique detects its associated degree makes an alert by a buzzer hooked up with the circuit. This proposed method consists of gas leakage detection system, weight measurement module, microcontroller, Wi-Fi module and alert system. The main basic NODE MCU micro controller requires the power supply ranging from 7- 12 volts. The board can operate at 7-12 volts. The other main component used is the Load cell. A load cell is a transducer that is used to convert a force into an electrical signal, which is used to measure a LPG gas cylinder weight. The Gas Sensor is also one of the components used to detect the leakage of the LPG Gas which converts one form of the signal into other form to avoid the noise of alcohol and cooking fumes and cigarette smoke. The MQ-6 can detect LPG gas concentrations from 100 to 10000ppm .LCD (Liquid Crystal Display) is used to show the output of the results of cylinder weight and gas sensor value. As, node mcu consist of inbuilt wifi module the data is sync to thingspeak it a cloud computing platform the through twilio the data is from synced then the buzzer gives the alert signals also the motor turns the regulator off then twilio helps to alert the user by sending SMS(Short Message Service),EMAIL about Gas Leakage and LPG Gas Completion Status

### ADVANTAGES

1. Innovative.
3. Centralised Database.
4. Easy to use.
5. Efficient cost.

### APPLICATION:

1. Education.
2. Research.
3. Organizations.

### METHODOLOGY

Methodology Design system takes two major parts by hardware module and software module, the hardware module is designed by schematic diagram, the software module is developed using C-language, in case of gas leakage. The gas sensor will detect the gas leakage and will then make the sensor output have a certain voltage value (analog voltage) . When the output voltage of the curtain has exceeded the specified limit value (settings) then this condition will microcontroller automatically activated the Buzzer to sounding to mark the people closest to the place is accompanied by an alert on the LCD screen of the device. This paper will discuss how the MQ-6 gas sensor using the node mcu microcontroller is used for the detection of LPG gas leakage. Power supply is a device used to supply power to all chips and components of the system, the supply is regulated for constant +5 volt DC the Arduino Uno microcontroller based system requires a power supply with a maximum current of 1A. On the Arduino board itself voltage will be changed to + 5V voltage. The MQ-6 gas sensor is a sensor that has a fast response to leakage gas LPG (liquid petroleum gas) and can be used in a simple set of drives, MQ-6 sensors commonly used in equipment detecting gas leaks in household and industrial activities Buzzer is a device that can emit a loud noise when active. Generally, buzzers are used to give signals to indicate certain conditions. In this experiment, Bel is used to indicate the condition of the detector that has detected an LPG leak that on this circuit, the buzzer will sound if there is a gas leak.Lcd is a display of the text of leakage gas

### 5. CONCLUSION

Our system will detect the leakage of the gas, in case there is any leakage it will send a SMS to the owner and it will turn off power and activate an alarm. The system will continuously monitor the weight of the gas. Gas leakage leads to severe accidents resulting in material losses and human injuries. Gas leakage occurs mainly due to poor maintenance of equipment and inadequate awareness of the people. Hence, LPG leakage detection is essential to prevent accidents and to save human lives. This monitoring and detection system is proposed mainly to meet the safety standards and to avoid fire accidents because of leakage. In simulated fires and gas leaks A warning system can work. Email and SMS can be received directly by the mobile device. Thus, the concept of IoT based Smart Kitchen and Avoiding Fire Accidents Due Leakage of LPG Gas is applied and verified experimentally. The Output data of this system is continuously transferred to the User in the IoT cloud data Transfer Process.

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