IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

ISO 3297:2007 Certified ⁜ Impact Factor 8.102 ⁜ Peer-reviewed / Refereed journal ⁜ Vol. 12, Issue 5, May 2023

DOI: 10.17148/IJARCCE.2023.125290

SMART KITCHEN USING IOT

Nikitha KS[1], Vidyasre N[2]

Associate Professor, Dept of CSE, BIT, Karnataka[1]

Student,Dept of CSE, BIT, Karnataka, India[2]

Abstract: Even though a lot of effort has been done to put the Internet of Things (IoT) in practise up until this point, most of the work still has to be done.Focuses on nodes with limited resources rather than connecting the embedded systems that are already in place to the IoT network. The Internet of things (IoTs) is a network of physical items or things that are integrated with electronics, software, sensors, and connection to allow for data exchange among linked devices, makers, and operators. It may be defined as linking commonplace objects to the Internet, such as smart phones, sensors, and actuators. These devices are then intelligently connected to one another to enable new types of communication between objects and one another. Through the use of existing network infrastructure, IoT enables remote sensing and control of items.

It also offers comfort, economy, efficiency, and precision. Since anybody may now get connectivity for anything from anywhere at any time, it is anticipated that these connections will grow and develop into a highly developed dynamic network of IoTs. Our work here aims to improve the Internet-oriented approach with semantic-oriented techniques, as both are necessary to create useful, sophisticated IoT applications that are anticipated on rich embedded devices.

I. INTRODUCTION

Human life has transformed as a result of IoT. Networking of common things is made possible by changes to internetworking technology and the enormous growth of Internet users.

Due to each object's integrated computing system within the internet backbone, it may be uniquely identified. With the Internet of Things, connectivity between machines and people as well as between people and computers will be extended to actual objects.

We suggested creating an SMS-based Gas Leakage Alert System and designing it from the ground up. Gas leaks in a kitchen were found using gas sensors, and a NODE MCU microcontroller with lua programming was interfaced with the sensors' outputs. In our houses, gas is a major source of energy for cooking and heating. Liquid petroleum gas (LPG) and natural gas are the two main formsof gas used for these uses.

This project intends to provide a safety-assuring system that will identify an LPG leak and immediately shut off the cylinder valve.

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This project intends to provide a safety-assuring system that will identify an LPG leak and immediately shut off the cylinder valve. By automating every work around us, the Internetof Things aims to improve our quality of life.
Designing houses, buildings, cities, and industries has prioritised safety. Despite the measures taken to address this issue, accidents are constantly increasing as a result of gas leaks. This work is a first step towards preventing fires caused by gas leaks.

II. MOTIVATION

For house safety, a gas leakage monitoring system design is suggested. This technology recognises when LPG is leaking, notifies the user through SMS, and, in the event of an emergency, shuts off the power while sounding the alarm. Another benefit of the system is that it uses a load sensor to continually check the amount of LPG in the cylinder and alerts the user if the level drops below the 2kg threshold.The apparatus guarantees security, guards against suffocation and explosion brought on by gas leaks, and keeps an eye on all software functionality.

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III. 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.

IV. DRAWBACKS OF EXISTING SYSTEM

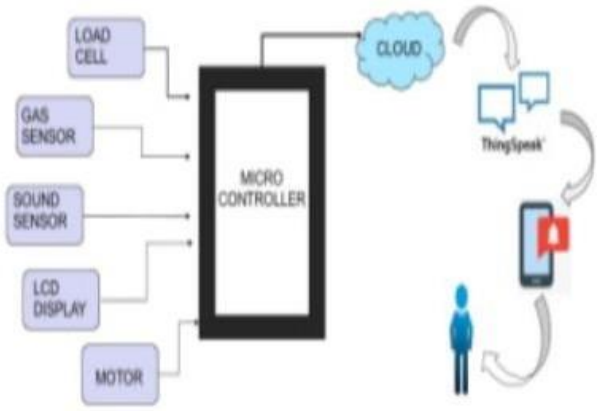
- **Less User Friendly:** Due to the delayed retrieval of daily activity data and records and the ineffective and inefficient maintenance of records, the current system is not user pleasant.

- **Complex for generating the report:**

The report is prepared at the conclusion of the session since it requires additional computations and work. Additionally, the pupil is unable to increase their attendance.

- **Lengthy time:** Since all work is done manually, we are unable to produce reports in the middle of a session or as needed because doing so takes a lot of time.

V. BLOCK DIAGRAM



In a block diagram, the major components or functions of a system are depicted as blocks connected by arrows that indicate their relationships. Connections between the blocks. They are widely used in engineering for process flow diagrams, software design, electrical design, and hardware design. Block diagrams are frequently used for higher level, less technical explanations that aim to make overarching concepts clearer without worrying about implementation specifics. Compare this to the schematic and layout diagrams used in electrical engineering, which display the specifics of how electrical components are implemented and built.

A system can be graphically represented as a block diagram, which offers a functional perspective on the system. Block diagrams aid in the creation of linkages within a system and help us better comprehend its functioning. Here, all of the hardware, including the load cell with amplifier, the gas sensor, the sound sensor, the display, and the motor, is connected to the microcontroller, which is the node mcu esp32. Due to the node mcu's built-in wifi module, which allows data to be saved in the cloud, the user is notified of emergencies through api.

VI. SURVEY

The survey review and project theoretical foundation are included in this chapter. The survey review mostly discusses analogous projects written by other researchers, the challenges they faced, the restrictions they faced, and any improvements that should be done.

a. IOT in the Kitchen: Monitoring stovetop for fire safety-- This study discusses safety while taking into account the flame sensor on the burner side, which primarily searches for flame leakage. Additionally, the user receives a warning message if the PIR sensor does not detect any movement. The system has to be connected to the internet.

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The system's disadvantage is that all of the gadgets stay unconnected if the internet is down, increasing the likelihood of an accident. Through our project, we have attempted to address this problem by employing the GSM module as the system and user device's communication medium.

b. **IOT-based Smart Kitchen--** -This system is fairly applicable to overcome all challenges. It uses SMS to send the alert message to the user but its major drawback is the cost. The cost of the system is high and hence proves to be inefficient due to the user. Our system works on the same principle but the several cost of the project makes the difference. The system implemented by us costs around 4500 Rupee which is 42% less than the earlier system available in the market.

c. **Automation and Monitoring Smart Kitchen based on IOT--** This system handles all of the automated tasks performed in the kitchen. It employs IR and PIR sensors to detect flames, DHT11 and MQ235 sensors to locate temperature, and IR and PIR sensors to detect motion and gas leaks. This system depends on apps and needs a constant internet connection. Since continuous internet access is impossible in remote regions, the likelihood of an accident rises. Aside from this, our solution is more effective in terms of cost, dependability, andnetwork concerns.

d. 2017 saw the release of **"Smart Gas Level Monitoring, Booking & Gas Leakage Detector over IoT"** by Kumar Keshamoni and Sabbani Hemanth. The primary purpose of this system is to distribute live data via a WI-FI module in the cloud and to sound an alert in the kitchen once a gas leak begins. The concept for a safe kitchen employing electrical equipment was introduced in 2014. The device will sound a siren to notify the user if there is an LPG leak in the kitchen. The ARM CPU version 7 and Kiel software were used to produce this study.

e. The authors "Vinay sagar K N, Kusuma S M" reported about the Wireless house Automation system (WHAS) via IoT system in **"HOME AUTOMATION USING INTERNET OF THINGS,"** in which it is sometimes termed a smart house. Computers or mobile devices that are used to operate basic house features and operations automatically through the internet from anywhere in the globe make up the smart home system. Thus, a smart home system can enable the saving of both human and electric energy. This system's key benefit is that it lets users operate numerous lights, fans, and appliances in their homes remotely while also saving the data in the cloud. The system would automatically alter based on the information collected by the sensor, and it was built to be inexpensive and scalable so that it could be used to operate a variety of devices.

f. The authors "Hina ruqsar, Chandana R, Nandini R, Dr. T P Surekha" discussed xively, a secure scalable platform that includes directory services, data services, a trust engine for security, and a web-based management application, in their **article "INTERNET OF THINGS (IOT) BASED REAL TIME GAS LEAKAGEMONITORING AND CONTROLLING."** Additionally, it aids in establishing a common channel for communication between every external device linked to the cloud and every other device. In the ecosystem of the internet of things, Xively has been around for a while. The buzzer and exhaust fan are the home rescue teams that are notified when a gas leak is detected by the gas sensor. From here, the gas will be altered and replaced inside. An electromechanical device called a solenoid valve is used to for regulating the flow of liquid or gas. A plunger inside the coil moves when the coil is keyed up, creating a magnetic field. When electrical current is cut off to the coil, the valve will revert to its de- energized condition. Here, one may quickly determine the actual day and time of the hazard utilising this technique.

g. The authors **"V. Ramya, B. Palaniappan" of "EMBEDDED SYSTEM FOR HAZARDOUS GAS DETECTION AND ALERTING"** concentrated on how the microcontroller was created and operated based on detecting poisonous gas and then notifying the system. Here, the embedded system method was employed to ascertain how the dangerous gases, such as LPG and propane, were sensed and shown every single second in the LCD screen. When the gas level surpasses its usual level, an alarm is immediately triggered and an alert message (SMS) is also delivered to the authorised person through GSM. The advantage of this automatic detection and warning system over the human technique is that the emergency is accurately detected very soon, which in turn causes the urgent situation to spread more swiftly.

h. The authors "Prof.M.Amsaveni, A.Anurupa, R.S.Anu Preetha, C.Malarvizhi, and M.Gunasekaran" addressed how to detect and regulate LPG gas, which is mostly composed of butane and propane, in their article **"GSM BASED LPG LEAKAGE DETECTION AND CONTROLLING SYSTEM."** The MQ6 gas sensor was employed by the inventors of this technique to identify gas leaks. The microcontroller then transmits an active signal to other devices that are linked externally as soon as the leakage is identified by the sensor. The user was then issued the alarm message through the GSM module. This method has the advantage of lowering gas concentration. Despite the fact that this

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method lowers the gas concentration, this system's flaw is its ineffectiveness at utilising the microcontroller, which is employed here is less, and it also necessitates programme adjustments whenever several SMS are to be delivered at once a time.

i. The authors of **"AUTOMATION AND ENERGY MANAGEMENT OF SMART HOME USING Lab VIEW,"** J. Ashley Jenifer, T. Sivachandrabanu, and A. Darwin Jose Raju, detailed how the data from the sensors has been input into the computer. The photovoltaic installation in this system is developed to deal with energy. Then, the sensors, actuators, and devices were bound using the Mikro C IDE. Lab VIEW (laboratory virtual instrumentation) is included. It was performed to visualise house automation, including lighting, temperature control, security, landscape maintenance, and energymanagement.

j. **IOT BASED SMART KITCHEN** is the title of the project by Survyamandadi, Yashaswini C, and Suraksha for an IEEE paper in 2019. This system uses five modules to define a safety mechanism in this study. The modules come with a smart container that can detect gas leaks and smoke and have a user interface.

VII. CONCLUSION

In the event that there is a gas leak, our system will detect it, cut off the power, sound an alarm and send an SMS to the owner. The weight of the gas will be continually monitored by the system. Gas leaks are serious mishaps that cause property damage and human injuries. Poor equipment maintenance and a lack of public awareness are the major causes of gas leaks. In order to avoid accidents and preserve lives, it is crucial to identify LPG leaks. The main purpose of this monitoring and detection system is to satisfy safety requirements and prevent fire incidents caused by leaks. An early warning system can function in practise fires and gas leaks.

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