An IOT Based Intelligent Safety System with sensors For Smart Home

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Abstract- *In this paper we have developed an IOT Based Intelligent Safety System with Sensors for Smart Homes so that it will be able to ensure safety for each and every electrical appliance present in homes and also ensure safety for LPG cylinders present in the homes and ensure safety against a fire hazard as well .Whenever there is a risk of any problem occurring or a problem is occurred when user not there at home .User receives a alert to take preventive measures . Along with the user an SMS is sent to a nearby recue station to take control of the situation. Users are also able to monitor the electricity level of each individual load and LPG cylinder leakage and also when there is a fire hazard using a web application user can be warned by an SMS or when the buzzer is heard. This system will avoid any heavy power usages in homes. The system will also provide security in kitchen and electrical lines. In kitchens to sense the LPG leakage gas sensor is employed and electrical voltage sensor is used to find any short circuit occurrences in the transmission lines. We also use the flame sensor to detect any fire accidents in homes. Arduino takes the pulse from the gas, voltage and a flame sensor then calculate the threshold values and display the readings on the web application. The sensor reading is stored in the database. The reading of the energy level and gas level and flame level is also sent to the phone of the user via an SMS and for safety purpose SMS is also sent to the nearby rescue station ,Whenever any problem occurs these sensors senses the condition and sent alert via an SMS.*

Keywords*- Advanced Metering System ,Smart grid, Smart Bidirectional Interaction, SMS.*

I. INTRODUCTION

IoT model, several of the living and non-living things that features USA are on the web in one type or another. "Wireless Bluetooth, Radio frequency Identification, Wireless-Fidelity and embedded sensor are gadgets which are empowered by Wireless technological innovation". It has progressed from its early stage and it's really on the sting of adjusting the current mounted inter-net into a well featured forthcoming net. There is degree amalgamation of mobile technology in to home automation system thanks to the rapid advancing development and it benefits in

lowering its price. we tend to recommend a framework that monitors the LPG gas level and electricity voltage level from residential send it on to the house user. AMR system is segregated to wired AMR system and wireless AMR system depending on the mode of communication utilized. There are unit infinite mistakes created by humans. Human resources area unit wasted and plenty of alternative complications occur. We then considered to develop a system which will be on top of method mechanically. detector is connected with our electricity main board which will scan the input voltage reading once specific a amount. Similarly, for LPG cylinders additionally a detector is connected for reading gas level. These sensors area unit controlled by a microcontroller and records are transmitted to the centralized server and shown within the application. If any drawback happens a SMS alert are send to the user and also the near rescue station.

II. IDENTIFY, RESEARCH ANDCOLLECT IDEA

[1] Bhavna and Dr. Neetu Sharma (2018). In this paper author first highlights about the current technology available for Home Automation and also explains about the importance of Security needed in homes and it is a major concern for people. They explain the basics of Home Automation System and in what way it works. This system lets a user keep track of their homes using their computer and can also appoint actions that need to happen depending on time or the provided readings from the various sensors attached to the various devices in home. Sensors like light, temperature and sound. They also explain that without human interference energy can be saved efficiently and since there is no human interference and all actions are performed automatically therefore it successfully saves a lot of time .The main objective of the paper is to automate all the appliance around the house so that users are able to supervise all the appliances using this technology .And in case of an emergency they are notified to take safety measures. Later in the paper they briefly explain about IOT and how it functions and how by using different sensors we can get readings which can be send to the user either to their mobile or personal computers by making use of a wireless connection. Then further in the paper they compare wired and wireless connection and the

advantages of wireless connection over wired connection. First advantage is that wireless connection is more cost efficient and does not require cabling whereas a wired connection is more costly and requires a lot of cabling .Second advantage is that if there are any advancements in technology it can easily be modified in a wireless connection whereas in awired connection modifying any changes is very complicated and time consuming. Third Advantage is that wireless connection can be used in an any type of buildings as in which have a complicated architecture where setting up a wired connection is difficult .And the last advantage they discuss about is since wireless connections involves mobiles or a smartphone which is why they can be controlled from any location but the device has to be around the network but with wired connection this is not possible. At Last in the the paper they talk about the changes that can be made to this system in future to make it more efficient ,cost friendly and easy to use .Like in future they can focus on the design of the product and can use new technology to make it more efficient.

[2] P. Kanaka MahaLakshmi, P.S.G. Aruna Sri and P. Gopi Krishna (2019) .In this paper they highlight about the accidents caused by gas spillage or a short circuit etc in residential or business area .But in this paper they mainly focus on the mishaps caused by gas leakage and they create a system to warn people about gas spillage beforehand to take preventive measures. They further explain the risks involved in leakage of LPG gas which is mainly used in homes for cooking. Risks like if a person inhales large amounts of this gas then it can cause inflammation of the throat and bother the eyes and nose as well.So, to avoid damage to the people or property they develop a system to keep a track of the gas reading so that before any mishap happens the concerned people are notified. They use a sensor to sense leakage of any type of gas like LPG, vaporous oil etc. Sensor they use for this system is MQ5 Sensor. This system is very helpful for security purpose of a home or a full society by alarming the people about the leakage of gas. They are various methods to notify the people about the mishap like by sending an email, a text message, or by a light indication or a voice indication. This system will also notify the gas office about the issue through an instant message. They use Raspberry Pi3 for their project to which the sensor is attached. The warningis given by an audio whenever there is a leakage which is "Gas is Leakage". Also there is an LED attached which is also used to alert people as when there is gas spillage the LED is Turned On. Software attached to the Hardware uses Python 2.7.15 language. This programming includes implanted c. When the sensor reading is more than (>700ppm or <700ppm) then an alert message is sent to the people. LED is switched on and a buzzer is triggered and a sound sign "Gas Leakage Detected" when spillage is more than (>700ppm) and the sensor reading and

"LPG GAS SENSOR" is shown when it is (<700ppm).They further discuss about the future scope of this system.

[3]N. Mohana Sundaram, S. Arunkumar, S. Kaliappan(2018). This paper proposes a smart home security system which is based on IOT. Which enables the house owners to control their house appliances from anywhere as this system has remote access. We observe that this system provides security against many situations like intrusion ,gas leakage, status of the door lock , observing when the lighting load is high and then as preventive measure switching OF the excess lighting load and finally detecting pressure level of LPG gas cylinder .For detecting all of these sensors are attached to the home and web server is used and all of this is controlled using IOT technique. Proteus software is used to build the system.In this system they use an Infrared Obstacle Sensor which is used to sense intrusion in home in the absence of the owner to protect the house from theft. They use various sensors get warned before happening of any mishaps. Sensors like Gas sensor and Force sensing resistors to detect gas leakage and to check status of door lock. Readings from all these sensors supervised round the clock and all these readings are stored in the database. In case of an emergency alert is sent through the attached GSM module.

[4] Naralasetti Veeranjaneyulu1, GaviniSrivalli, Jyostna Devi Bodapati(2019).In this paper they propose a home automation system for electrical appliances and a security system. Using this system all electrical appliances of home can be controlled like switching the fan ON/OFF etc ,With regards to human motion detection.In this paper they present another solution to keep air conditioner temperature on the basis of room temperature. And they also provide security as it is a major concern nowadays .They provide all these solutions by utilizing Arduino UnoProcessing Unit. Sensors employed in this system are PIR, Temperature and Ultrasonic Sensor .Function of temperature sensor is to sense the room temperature and ultrasonic sensor is employed to sense presence of any unidentified object then it alerts the buzzer for security purpose. PIR sensor function is explained as it senses any human presence and any human is present then light is switched ON.In this paper it explains how all gadgets are controlled using this system as whenever the sensors sense presence of human in home they switch On the electrical appliances. In absence of any human presence electrical appliance stays switched OF.And also when sensor senses the room temperature and if it is more than 30 °C then the system switch on the air conditioner and simultaneously switch off the air conditioner when room temperature is low.All these sensors are input devices for the Arduino and Lights, Air conditioner and Buzzer are output devices. They use Arduino IDE software is used for the coding part. In the further part of

the paper they discuss how they test the sensors to get desired results.

III.WRITE DOWN YOUR STUDIESAND FINDINGS

SCOPE:

The foremost goal of our project is to create a system so that it will be able to ensure safety for each and every electrical appliance present in homes and also ensure safety for LPG cylinders present in the homes and ensure safety against a fire hazard as well .Whenever there is a risk of any problem occurring or a problem is occurred when user not there at home .User receives a alert to take preventive measures . Along with the user an SMS is sent to a nearby recue station to take control of the situation. Users are also able to monitor the electricity level of each individual load and LPG cylinder leakage and also when there is a fire hazard using a web application users can be warned by an SMS or when the buzzer is heard.

OBJECTIVES:

Objective of this project is to create a smart home security system to ensure safety of homes even when the users are not available at home. Arduino takes the pulse from the gas, voltage and a flame sensor then calculate the threshold values and display the readings on the web application. The sensor reading is stored in the database. The reading of the energy level and gas level and flame level is also sent to the phone of the user via an SMS and for safety purpose SMS is also sent to the nearby rescue stations.

1. PRPOSED WORK

This method properly monitors the LPG and electricity problems. User will be intimated with the problem. To calculate input voltage and current voltage and current sensor is placed to identify the power input in home. So we can avoid the damage to the appliances if any power fluctuations occurs. No man power is needed for checking in homes. To provide monitoring and control through PC a web server facility is provided using PC. It will also provide that whenever any fluctuation or leakage occurs it Sent alert through via SMS. The system will also send SMS to nearby rescue stations.

(i)   MODULES:

- Registration & Login
- Connecting Hardware
- Receiving Signal

- Connect to Server
- Sending Alert
- Web Application

Registration &Login:

In this module we explain that users can perform Login operation when they are already registered on the website or if they are not registered then they can perform the register operation on the website. After user is registered and logged in on the website, they can proceed to following phase. New users can register themselves to the website so that theycan access the web application through a browser. Which enables the user as well as the rescue officer to observe the actions happening in the premises. This helps the rescue officers to keep track of home so that if any problem occurs, they can solve it effortlessly. This application has made it easy for illiterate people as well as they can register to the application using their personal email id. By this user and recue officer can register to the application easily just by providing their email id in the provided text fields.

Connecting Hardware:

In this module, hardware components are connected. Components connected are current sensor, voltage sensor, gas sensor, Flame sensor, power supply to the Arduino board.

Receiving Signal:

This module explains that to the Arduino board transmitter and receiver models are connected. Positions of transmitter and receiver is given in a way such that transmitter is positioned within the field hence the receiver is positioned to the system end. An id is allotted to transmitter and receiver while configuring it. Every Transmitter positioned within the field should have knowledge about the receiver's id which is their destination address. Signals from the transmitter present within the field are received by the receiver. UART is utilized through which receiver is connected to the web server. Since UART is cost efficient it is employed while interfacing Arduino microcontroller and also to achieve fast connection. When data is received by the receiver from the transmitter, request to the web server is send by the receiver. In the architecture of the system a SERIAL communication cable is attached to the Arduino microcontroller.

Connect to Server:

In this module, it is explained that by executing to click a button event Arduino board and server is connected.

After clicking the server button to start the server data is received by the computer through Arduino board.

Sending Alert:

In this module data processing is explained as the process in which reading from the sensors present in the field is observed accompanied by the threshold values. It is noted that the threshold values vary according to the fixed values. SMS is sent to the users and rescue team if sensor values are detected to be abnormal. A buzzer is alerted when the sensor data meets the threshold level or is near to it.

Web Application:

Web Application is designed in such a way that we can keep track of data from all the sensors from anywhere through internet. Web application is created using HTML and JSP languages. JSP is defined as a server-side scripting language for web development. It is explained that along with HTML code JSP language can be used. This can be done with other various web engine frameworks. Information can be retrived from the webpage when it is interrogated by using the web application
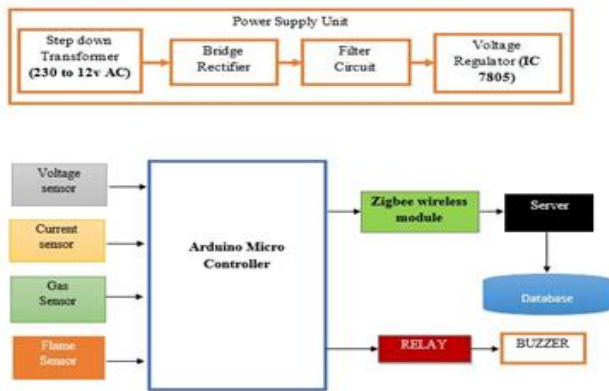

Fig 1. System Architecture

Fig 2. Screenshot of Home Page of Web Server

Fig 3. Screenshot of Register Page of Web Server
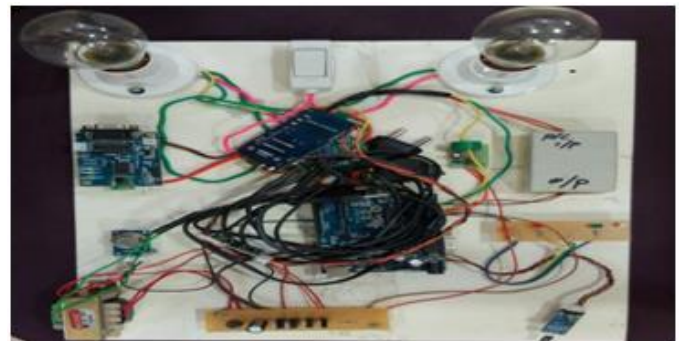

Fig 4. Screenshot of Login Page of Web Server
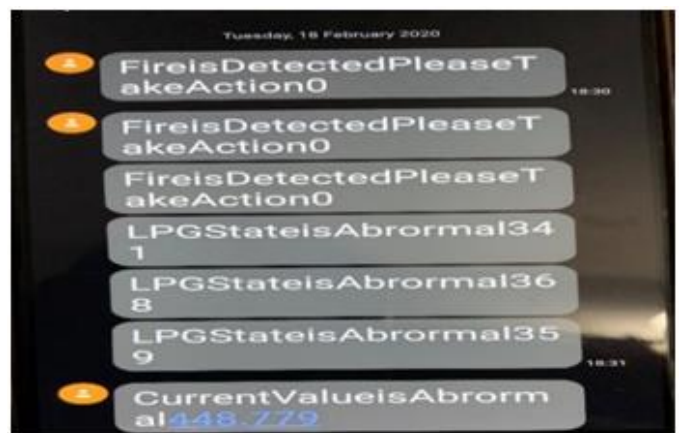

Fig 5.Screenshot of Project Model

Fig 6. Screenshot of SMS Alert

IV. CONCLUSION

We have shown an internet connected home monitoring and controlling system that makes you aware of any voltage fluctuations and LPG leakage amongst devices and users. So, we can monitor and regulate it. The main objective of the project is to develop smart home security system. The Arduino takes the pulse from the gas and voltage sensor, calculate the threshold level and displays the reading on the application. The sensor reading is store in the database. The reading of the energy level and gas level is also sent to the cell phone of the user by a message. The foremost goal of our project is to create a system such that it will be able to assure safety for all electrical devices and LPG cylinder present in homes and the user will be able to acquire an alert if any problem occurs. Along with this, the SMS will be sent to the nearby rescue center. The user can regulate the electricity level of each individual load and LPG cylinder leakage using a web application also has a function in which web application work as setting data to set different data parameter decided by the users.

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