Emergency Alerting System

Prof. Amol Dande, Saivedant Hava, Mayank Rajmani, Pritam Sarangi, Prajwal Kalbhor

(Dept. of Comp. Sci & Engineering, MIT-ADT University, India)

Abstract: - *Mobile messaging service is increasingly used to disseminate necessary information in the event of an emergency. As a result, a wide range of institutions, including colleges and universities are currently partnering with third-party vendors promises to improve physical security by rapidly providing such post. Unfortunately, these products do not work as announced due to mobile infrastructure limitations and thereby giving their users a false sense of security. In this article, we do our first in-depth investigation and characteristics of the boundaries of an emergency alert System (EAS) uses SMS as a security incident feedback mechanism. Do we display text message-based emergency alert systems ? can only respond to delivery requests in 10 minutes due to*

WARN Act, but also potentially cause other voicemails and text messages traffic will be blocked at above 80%. We have the next shows that our results are representative of reality in by comparing them with some recorded material but not previously understood failure. Finally, we analyze the target messaging mechanism as a way to use effectively deployed infrastructure and third-party EAS. In doing so, we demonstrate that this increasingly deployed security infrastructure does not meet the stated requirements for large-scale population.

Keywords: *Emergency Alerting System, IoT Devices, Sensor Data Collection, Cloud Computing, Mobile Application Development*

I.   Introduction

In times of disaster, emergency alerting systems play a crucial role in limiting or eliminating casualties and property damage. In this article, we provide a method that makes use.

To find dangerous gas concentrations in the environment, an ESP32 microcontroller, a DHT11 temperature and humidity sensor, and a MQ2 gas sensor are used. A mobile application created with Flutter displays the data gathered by the sensors in real-time together with the temperature, humidity, and gas concentration levels. Additionally, the data is kept in JSON format in AWS DynamoDB for upcoming analysis and decision-making.

II.   Existing Work

FPGA-GSM based gas leakage detection system: - Gas leakage is a significant issue in companies, residential buildings, and gas-powered vehicles. If the leak is not identified, it might cause an explosion and serious damage to people and the environment. The On-site alarms are used in traditional leak detection systems to provide notice. In this research, we present a leakage detection approach in which leakage information is also transmitted to the first reaction team via wireless media. This ensures that preventive actions are taken quickly, even if there are no humans on-site. The detecting system detects the leakage and promptly initiates a warning call via GSM. A gas leakage detecting system prototype has been designed and tested with LPG (Liquefied Petroleum Gas). The experimental results suggest that the system can identify leaks in less than a minute.

Development of Gas Safety Management System for Smart Home Services: - We suggest a plan to make gas safer. Using wireless communication tools to manage something. Gas safety devices that are smart and clever. Our way of doing things. Configuration means a setup or arrangement that has a machine which can put out fires automatically. There are machines called detectors that can sense things. There is also a machine called a wall-pad that you can use to control things. Another machine called a microcomputer controlled micomgas can help you manage these machines. A device called a meter is used to keep track of how much gas is flowing and how much pressure there is in the gas. It also helps detect any problems that might happen. About shaking of the ground. The fire-fighting system that works by itself is being tested. This tool checks for both gas leaks and monitors them. The temperature of the environment is being measured, while the tool used to measure it is called a detector array. Amounts of smoke and poisonous Co gas in the air. Based on what is noticed. When certain circumstances occur, the micom gas meter will stop the flow of gas by closing a valve inside it. When a problem is detected, the fire-extinguishing system will turn on to stop the fire. An external valve can release material that

---

puts out fires when it is sprayed onto them. Sensors send messages and do something when they sense smoke or fire. We found Co. government to ensure safety and security of citizens will be provided. The information will include methods that use advanced technology and strategic planning to prevent and deal with threats. Information about gas safety devices and sensors is sent to a wall control panel. The information is sent to a server immediately. kept track of through a connection from an outside network to a website or app. An app to keep track of gas safety. To make sure something is real or true. We tested a gas management system for smart homes. How well it can be used in Korean apartments in different situations.

Gas Leakage Detection Based on IOT: - Gas spillages result a genuine issue in family and other regions where family gas is utilized, hence the proposed gas spillage discovery and checking framework is created. There are numerous strategies accessible for booking a Gas Refill, strategies incorporate online booking, telephonic booking etc. It'll be troublesome circumstance for the one who employments LPG gas for cooking frequently. The point of this paper is to display a unused framework consequently books a barrel when the gas is approximately to purge is by sending a notice to the gas organization utilizing Wi-Fi utilizing Web of Things approach. In expansion to that sensor is utilized to identify gas spillage at domestic. In case the gas spillage is detected consequently, it will send SMS to the client. Wi-Fi is one of the foremost utilized systems over the world. Consequently, stack cell has been utilized to screen the weight of the LPG gas routinely. The values are another nourished to the microcontroller. On the off chance that the gas within the barrel shows a esteem where the remaining rate level is crossed underneath the limit level set for gas to be shown as getting purged, at that point a notice will be conveyed to gas endeavor naturally to book the modern barrel. In this way, answer notice will be sent to the client approximately the booking status. At the same time, application computer program is created within the gas endeavor to educate and record the booking. This, work this makes a difference the society to particularly show gas spillage conjointly makes a difference both clients and the office to induce the gas booking made naturally utilizing the IOT method.

III. Motivation

Gas overflowing comes about in shifted mishaps following into each misfortune too as human wounds. In human's way of, life climate gives the first crucial affect to their wellbeing issues. The peril of terminating, blast, suffocation all square measure backed their physical properties such combustibility, poisonous quality etc. the number of passings much obliged to the blast of gas barrels has been expanding in later times. The clarification for such blast is much appreciated to substandard barrels, ancient valves, tired controllers and need of awareness victimization gas barrels boost the dangers. Reviews by oil firms found that numerous LPG clients square measure uninformed of security checks of gas barrels. One more reason is illicit filling of gas barrel conjointly causes mishaps. There's a prerequisite for a framework to identify and conjointly halt overflowing of LPG.

IV. Objectives

1. The objective of this venture is to distinguish spillage of Gasses, smoke and environment temp based domestic, car, businesses, etc. apparatus.
2. In the event that gas spillage happens with the assistance of framework, able to distinguish it and makes a 4 alarm by buzzing the buzzer connected with circuit.
3. This framework will to contain GSM module which can be utilized to send the alarm message to the client.
4. With the assistance of GSM module and ESP-32 ready to moreover control the domestic machines with the assistance of ESP-32 microcontroller.
5. For showing message LCD of 16x2 will moreover be there.
6. Such sensors, these days, found conjointly in applications including discuss quality control frameworks and contamination observing.
7. Today's sensors are designed to be very sensitive to various things. This store has a great variety of gas options and the store itself is very small. They decreased the amount of energy they use to better adjust. Mobile solutions.

V. Project Plan
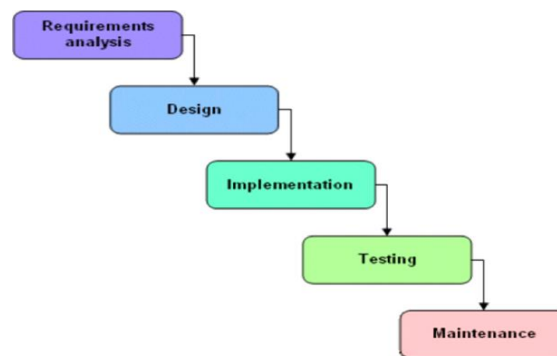
We used the waterfall method to develop the system. This picture shows a plan that we can use to get what we need. The Annexure includes some guesses or calculations. To create a map of our area. We thought about the stages in a waterfall model when making calculations. First, we looked at each part individually and then we calculated the necessary guesses.

VI. Methodology

We intend to utilize four different measurements, namely Gas, Smoke, Temperature, and n The MQ6 humidity sensor module is utilized for detecting gas. When fuel, Smoke, temperature changes, and humidity fluctuations are likely to happen, resulting in a potential occurrence. The A0 pin of ESP-32 registers a frequent pulse that is constantly monitored. Or ESP-32 consistently detects a strong pulse signal on its A0 pin. The pin labeled A0. If the Gas module sends a HIGH pulse to ESP-32, then... Gas, smoke, temperature, and humidity leaks will be displayed. Displays an alert message on the LCD screen and triggers the buzzer. The beeping persists repeatedly until the gas detector module detects something. The environmental factors of gas, smoke, temperature, and humidity. An alert message will be sent through the use of a GSM module.

The mobile number that has been officially registered. Once the gas detector module provides an indication, a response can be initiated. If the pulse to ESP-32 is decreased, the LCD display will indicate the absence of gas or smoke. A message regarding the levels of temperature and humidity. We have the ability to manage and regulate. It is possible to control the electrical devices in our residence through GSM technology. Perhaps rephrased as: "The NodeMCU module is a potential option." If there is a gas leak, then. The ESP-32 microcontroller will also terminate the connection. Electrical devices that are linked to a relay module.

The methodology needs to encompass the formulation of the problem alongside. The methods utilized to resolve the issue, demonstrate or negate. The supposition. The concepts presented in your writing through pictorial representations. This will help readers gain a better understanding of the information and reinforce it through visual aids. Wrapping up thoughts. In what manner did you successfully resolve the issue? Approach or procedure used to conduct research or achieve a goal. The solution of the problem involves the utilization of this. It's important to incorporate both computational approaches and practical information. If the task is

This section of the article focuses on the methodological aspects of computation. It is employed for the purpose of resolving the issue. An intelligent rewording of this text could be "The systematic approach to problem-solving using computer algorithms and techniques." "Tackles" or "addresses" the issue of.
1. Equations
2. Models

Framework: Input, Yield, Work, Victory, Disappointment Input: Sensor information flag which isn't customary or Alter in Flag Yield: Conclusion Client get educated with caution buzzer and Show to LCD Capacities: -
1. Get to (): - In this module we are reaching to access the highlight given by the module which Can incorporate Sensor information get to.
2. Control (): -In this module we are controlling the Alarm Framework by utilizing Framework which is associated to equipment or sensor information.
3. Broadcast (): -In this module we are attending to broadcast the alarm show to lcd.
4. Success criteria: If the information obtained via the process of receiving and gathering data is met in an effective manner. If the sensors become unstable or exceed a certain threshold, it will result in a prediction. There appears to be a case of unintended release.
5. Failure Conditions: Output not generated due to failures.
   1. Failure of software
   2. The malfunctioning of physical equipment.

3. The failure of the network connection has occurred.

VII. Flow Chart
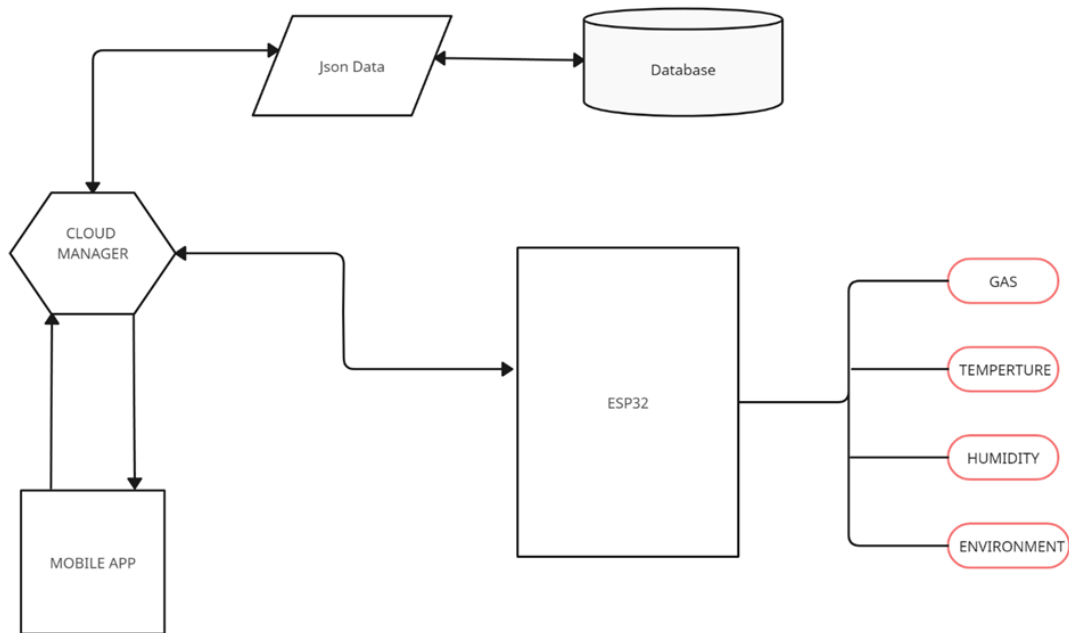
Data flow: - Data is collected by the ESP32 microcontroller from DHT11 and MQ2 sensors, then transmitted to the mobile app built with Flutter. The app shows current temperature, humidity, and gas levels and sends data to AWS DynamoDB in JSON format. Stored data for future analysis and decision-making.
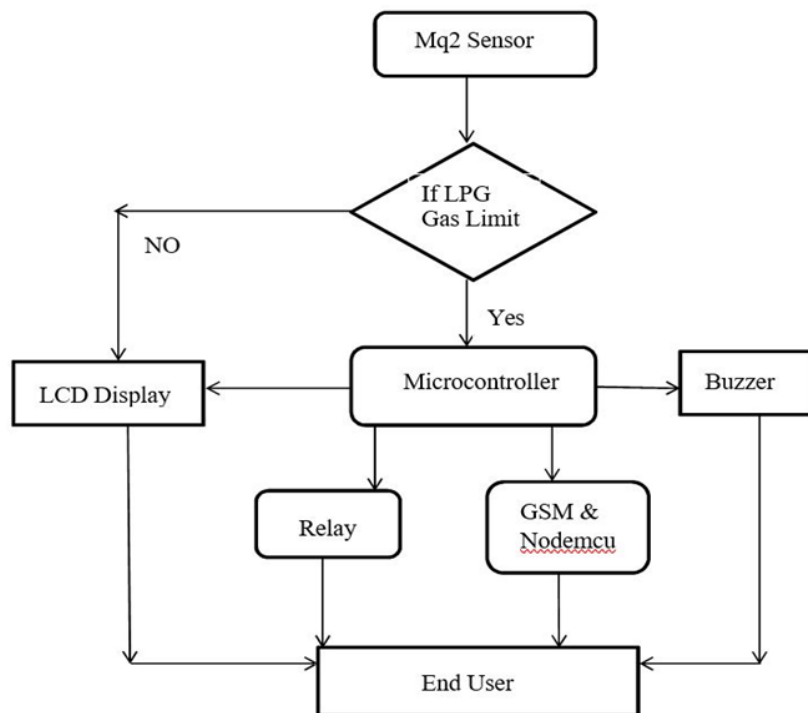
IX.   System Architecture

The system has three components: hardware, software, and cloud. The hardware includes the esp32 microcontroller, dht11 sensor, and mq2 sensor. The software includes code on the esp32 and a flutter mobile app, while the cloud uses aws DynamoDB for storing data in json.

X.   Project Scope

Develop an embedded system for real-time gas, humidity, and temperature detection with a safety focus, utilizing IoT technology. Users can conveniently monitor and store data related to gas concentrations and smoke in real-time. By using this iot program, users can access and see gas/smoke levels in their surroundings for safety alerts. To improve the system, project will incorporate sensors to give users important environment information, including detecting harmful gases and smoke in real-time. The system can detect hazardous elements to save lives and prevent disasters.

XI.   Future Work

The system alerts users to gas, smoke, temperature, and humidity. Future features include a GSM module for enhanced efficiency and security. This program is user-friendly and affordable. Additionally, the system detects gas leaks and sends instant notifications on smoke, temperature, and humidity to the owner even when the house is empty, which minimizes potential accidents. The GSM and NodeMCU modules improve safety in gas leaks. Both software and hardware have been tested with sensor modules. This system can add a sub system to monitor gas wastage, uses, smoke, temperature, and humidity. It's flexible and can accommodate more sensors and relays according to the gas supply setup. We're enhancing the system with software-based intelligence including automatic detection, control and alerts for gas, smoke, temperature and humidity. In the future, will notify emergency services of accidents and have a mobile and web app for real-time monitoring. The user app will add smart safety features. The system will be optimized for multiple settings and a smart multifunctional prototype will be piloted.

XII.   Conclusion

We proposed a system using an esp32 microcontroller, dht11 sensor, and mq2 gas sensor to detect hazardous gas. Data is sent to a mobile app that displays real-time readings. Data is stored in AWS DynamoDB in JSON format for future analysis and decision-making. The system can be used in various applications, such as industrial safety, home safety, and environmental monitoring.

Acknowledgements

References

Journal Papers:
[1]   In 2011 L Chun-Yuan Has Designed an Intelligent Fire Alarm System Based on GSM: - the purpose of the project is to solve the problem of complex cabling, missed declaration, and missing alarm of traditional fire alarm system. By adapting smoke detectors and using a variable threshold alert algorithm with temperature compensation the accuracy of the fire alarm is improved.
[2]   In 2015 K Sen, J Sarkar, S Saha, A Roy, D Dey, And S Baitalik, has developed an automated fire detection and controlling system based on smoke and heat detection: - it is comprised of a combination of electrical/electronic devices/equipment working together to detect the presence of fire and alert people through an audio or visual medium after detection. the system will send short message service (sms) to the registered mobile numbers and switch on a water sprayer or a solenoid pump to spray water or fire ceasing foam.
[3]   In 2013 P Y Mulge, Has Designed Remote Temperature Minoring Using a Wireless Sensor Network Prototype for Remote Room Temperature Monitoring: - this network will be used for the management of fire rescue operations. lm35 sensor senses the remote room temperature and temperature status is transmitted to the smartphone via gprs. this work aims at the monitoring of remote room temperature. this provides an opportunity to quickly respond to fire emergencies.
[4]   Srinivasan, Leela, Jeya Bharathi, Kirthik, Rajasree: - in this research paper they talked about gas leakage detection and control. in this paper, the gas leakage resulting into fatal inferno has become a serious problem in household gas is handled and used. It alerts the subscribe through the alarm and the status displays beside turning off the gas supply valve as a primary safety measure.