A PROJECT REPORT

Team ID	PNT2022TMID11782
Project Name	Gas Leakage Alerting And Monitoring System
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Department	Electronics and Communication Engineering

13. APPENDIX

Source Code

GitHub & Project Demo Link

1. INTRODUCTION:

1.1 PROJECT OVERVIEW:

The design of a sensor based automatic gas-leakage detector with an alert and control system has been proposed. This is an affordable, less power using lightweight, portable, safe, user friendly, efficient, multi featured and simple system device for detecting gas. Gas leakage detection will not only provide us with significance in the health department but it will also lead to raise our economy, because when gas leaks it not only contaminates the atmosphere, but also wastage of gases will hurt our economy. The need for ensuring safety in workplaces is expected to be the key driving force for the market over the coming years.

1.2 PURPOSE:

The detection system, which will help in detecting any gas leakage with the help of MQ5 gas sensor and send this data over the internet to the IoT module. On this Gas leakage detection system project, we propose an Arduino and IoT based gas leakage and that will inturn alert the user about this gas leakage. Hence, in this process, we can detect gas leakage in the early stages and prevent any future accidents. The finished device is connected to the IoT module over Wi-Fi. The maximum and minimum parameters of the gas can be set in the device accordingly**.** The device will continuously monitor the level of gas in the surrounding air with the help of MQ5 gas sensor. The signals from this sensor is continuously being sent to the Arduino circuitry. If any abnormal reading is found, which is more than the set parameters of the maximum level that can be present in the air, then the RGB LED lights will glow red and instantly the solenoid value will turn off and these readings will be transferred over the IoT module and the user will be alerted about this leakage. Once the gas leakage is detected, the buzzer is turned ON and a 'Leakage detected' message is displayed on the LCD. If the values of the gas present in the air is within the parameters, then the RGB lights glow green. Therefore, with the help of this project, we can easily detect LPG gas leakage with the help of IoT and Arduino and prevent any hazardous accident.

2. LITERATURE SURVERY:

2.1 EXISTING PROBLEM:

Fires cause serious damage and disrupts daily life in a devastating manner. Hence preventing them or reducing their effects is a top priority. Though there are many systems that have been created to tackle this problem, false alarms is a challenge that is yet to be avoided. In our model, the place to be monitored is under constant surveillance by a closed circuit television. At tactical points, a number of sensors are placed. The sensor include pir sensor, temperature sensor, heat sensor and gas sensor. Each sensor plays a vital role in detecting a fire if it occurs. On top of these sensors, the footage from the camera is also used to detect the fire through image processing. The main advantage of this system is that it has a very high accuracy. If the fire has been detected a mail is sent to the security and the nearest fire department with an attachment of the photo.

2.2 REFERENCES:

Mukesh Mahajanand Vishal Date[1] expressed the system which detects the gas leakage and can be **monitored on IoT. Ch.Manohar Raju[2]** describe **robot technology** here the mini robot finds the leakage in insecure places. Here author **developed android mobile app** which will receive information from many robot directly using Bluetooth. The disadvantage of the system is that before practically used in industrial are more setting and development is needed in detection and indication on mini robot simulation. **Mahalingam[3]** introduced design and implementation of economically suitable gas leakage detection system. The system ensures a **continuous monitoring and checking the gas level and detection**. This system is applicable only for restricted area where leakage is found or occurs. Beyond this system is not applicable. **Zhao Yang[4]** researched on leakage detection in gas pipeline system. To obtain the data from pipeline **SCADA system** is used for communication. **Aashish Srivasthava [5]** proposed a gas leakage detection system with the help of **MQ6 gas sensor** which detects LPG gas and sends the signal to microcontroller. The drawback here is that the microcontroller used is memory inefficient. **Sagar Shinde[6]** proposed the system real time detection of potential risk area, collect the data of leak accident and locate leakage point. This system is having protection circuitry consist of **exhaust fan and LPG safe solenoid valve**. MQ6 gas sensor is used to detect LPG gas leakage. The disadvantage of the system is that it can only detect leakage of LPG and propane gas. **Madhura Ghul[7]** proposed a paper on LPG level monitoring, booking and gas leakage detector, the proposed system helps in recognition, checking and control arrangement of LPG spillage. The **gas**

sensor MQ6 is used which mainly detects LPG and **buzzer alert system** is used. **Manaswi Sharma[8]** proposed a system detects gas leakage using a sensor and immediately turn-off the regulator knob to stop further leakage. A **wifi module sends SMS or e-mail** using the cloud to the user. **Anandhakrishna[9]** proposed an SMS based gas leakage alert system. Gas sensor are used to detect gas leakage in a kitchen. With the help of an **infrared sensor** the issue of gas wastage is also monitored. An alarm goes off whenever the sensor does not detect any vessel over the burner beyond a particular time period. **Sjeya Anusuya[10]** proposed an **innovative robot** that links on to the outer surface of the gas pipe and moves with the pipe to check for leakages. The kit consists of MQ2 gas sensor to detect the gas leakages. The robot will be moving continuously along the metal pipe, if there any presence of leakage the GPS sensor module will transmit the location to the cloud. **Dr. S.P. Rajaram[11]** expressed about **IoT** based gas pre booking and gas leakage detection using **IBM server**. Detection and transmission and receiving module are the two important modules in the proposed system. The outcome was security level of home can be increased by detecting gas leakage and sending an alert. **Ms. Fariha Aimen[12]** proposed a system based on **image processing** where SF6 gas leakage is detected. Since SF6 gas and air have different infrared absorption properties, it is easy to observe SF6 gas that leaks into the air through infrared imaging detection technique but this system could detect only one gas. **Gokula Kaveeya S, Gomathi S, Kavipriya K, Kalai Selvi A, and Sivakumar S[13]** proposed automated unified system of LPG using load sensor. In this approach gas leakage detection and gas refilling is done using the **MQ5 sensor, GSM, load sensor, raspberry pi, aurdino**. MQ5 detects the LPG frequently whether the flow of gas is normal or

abnormal, if it is abnormal, sends notification to user via GSM. If there is no response, the system automatically turns off. The problem in this is, gas cannot be refilled without the intermediate. **Mr. Sahil Adsul, Mr. Ashok Kumar Sharma and Mr. R.G. Mevekari[14]** proposed the Development of Leakage Detection System. In this approach the data such as humidity, temperature, pressure, gas detection, sound detection is acquired by using sensors. The sensors used are **DHT22/AM2302, TMP006, BMP180, MQ6, 20KHz microphone, 40KHz ultrasonic receiver, 40KHz ultrasonic module**. ZigBee is a wireless communication technology used to create small personal area network. This idea is to detect leakage with different parameters and test on different type leaks was achieved. This system can be designed by using low power microcontroller board and using more high quality sensors to detect accurate values at the output. **L.P. Deshmukh, T.H. Mujawar, M.S. Kasbe S.S Mule, J.Akthar and N.N. Maldar[15]** proposed a lab VIEW based remote monitoring and controlling of wireless sensor node for LPG gas leakage detection. This approach gives a system for monitoring the LPG gas leaks the presence of air. The methods used here are **wireless sensor network, sensor node, remote monitoring and controlling**. In this paper gas leakage is detected and alerts the user via **alarm, sending SMS** on user mobile phone and turns off the gas regulator valve. **Jinhao Sun, Jinhao Sun Yezi Xiajin Yan[16]** proposed the design of automatic detection processing device of gas leakage based on the **MB95204K**. Gas leakage causes loss of energy, personal injury and property damage. To solve these problems paper designed a gas leakage automatic detection and processing device by using Fujitsu MB95204K. Gases such as methane and carbon monoxide will automatically detect and alarm. The chemical transducer MQ5 detects concentration of gas general

signals and then does A/D conversion. **Vinayshri Nalk, Chaitali Bagwe, Neha Kunte, Vidya Ghadi[17]** proposed IoT based gas leakage detection system with database logging, prediction and smart alerting review. This approach makes use of **data analysis, IoT, MQ5 gas sensor and alarm**. Gas leakages in any areas can cause danger. Therefore we are using IoT technology to solve the proposed problem and make predictions which will be helpful in current and future use. **Halavva Patil, Shreedhar Niradi, Jyothi D.T, Seema J.S, Swetha D.G[18]** proposed smart gas booking and LPG leakage detection system. This approach makes use of **Gas sensor MQ06, GSM DC motor, microcontroller and load cell**. Proposed system consists of gas leakage detection sensor which is interfaced with microcontroller. If leakage is detected microcontroller immediately starts the stepper motor to turn off the gas regulator and message will be displayed on the LCD displayed. **Ahmed Imteaj, Tanveer Rahman, Hosna Ara Begum, Mohammed Shamsul Alam[19]** proposed IoT based energy and gas economic home automation system using raspberry pi3. When gas leakage is detected by gas sensor it makes the **WeMOS** know about this, which transfers signal to raspberry pi and it apprises the user immediately through GSM module. **PIR sensors** that automatically perceives whether there is any weight over the burner through the button module and if no then the system will turn off the stove using the relay module considering input of button module. **Asmita Varma, Prabhakar S and Kayalvizhi Jayavel[20]** proposed gas leakage detection and smart alerting prediction using IoT. This approach makes use of the **IoT, sensor, alarm, prediction, data analytics**. IoT is a network which can be extended with the help of physical devices that are connected with different types of servers and with help of internet they will be exchanging the data. Here IoT is used for gas

leakage detection consisting of smart alerting techniques which involves calling, sending text message and email to the user and helps to predict hazardous situation so that people will be safe. A dedicated mobile application could be made for system.

2.3 PROBLEM STATEMENT DEFINITION:

1. I am : Manufacturer.

2. I am trying to : Detect the leakage of gas in industries and in other areas in a short time.

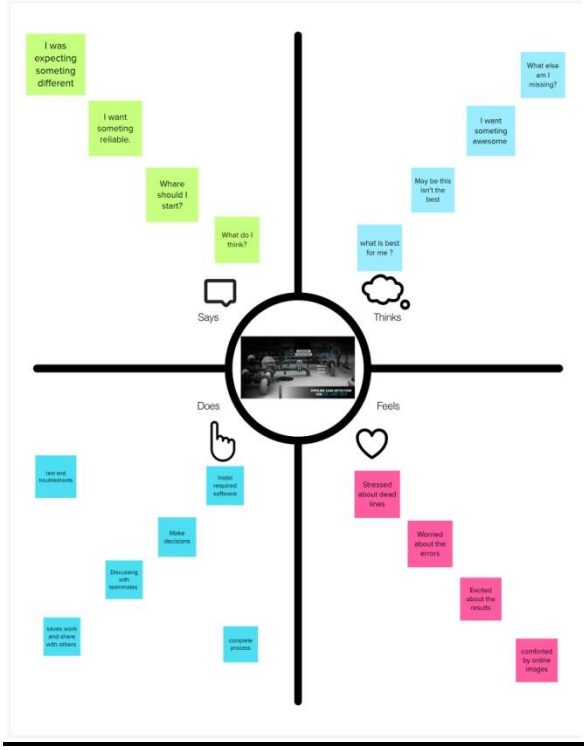
3. But : Using gas sensor is a major problem.

4. Because : When gas leakage is increased, the user gets the alert through SMS notification.

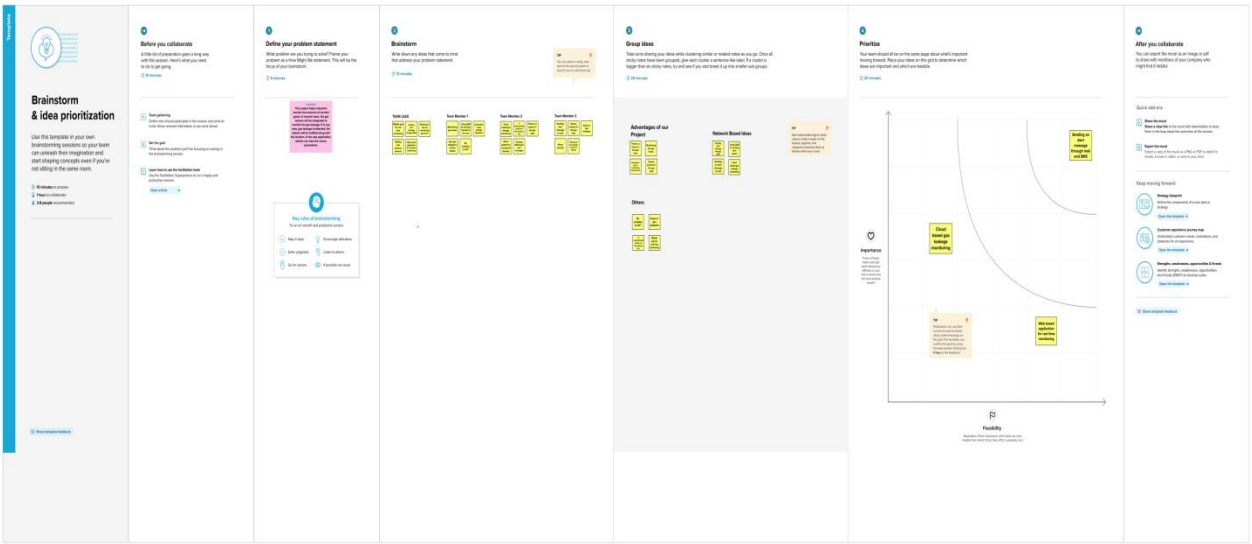
5. Which makes me feel : Many industries are facing losses due to gas leakage, this project will helps them to get rid of their problems.

3. IDEATION AND PROPOSED SOLUTION:

3.1 EMPATHY MAP CANVAS:



3.2 IDEATION AND BRAINSTROMING:



3.3 PROPOSED SOLUTION:

S.No.	Parameter	Description
1.	Problem Statement	To detect the gas leakage to alert the user through alarms.
2.	Solution Description	In order to have a control over such hazardous conditions we have proposed a system that uses sensors which is capable of detecting the gases such as LPG, CO, etc. This system will not only detect the leakage of gas, but it will also alert the user through alarms.
3.	Uniqueness	• Low Cost • Reliability • Predict hazardous situation
4.	Social Impact	• This system will create a vital impact in the society because, there are lot of people who are not able to detect the gas leakage prior to the fire accident. • We have used the IOT technology to make a Gas Leakage Detector for society, which includes Smart Alerting techniques involves sending an alert message or mail to the concerned users.

3.4 PROBLEM SOLUTION FIT:

1. PROBLEMS:

- Having no proper system for controlling or monitoring the leakage.
- Suffering from many losses due to the gas leakage.
- Facing heavy budget problems in buying and installing a system for monitoring and controlling.

2. CUSTOMER SEGMENT:

- Hospitals
- Mining Industries
- Oil, Gas, Polymer Industries

3. CUSTOMER CONSTRAINTS:

- High budget in installing other products.
- Complexity in installation.

4. AVAILABLE SOLUTIONS:

- Availing network connection from a reliable service provider.
- Upgrading to a premium network plan.

5. PROBLEM ROOT CAUSE:

- Location of the device installation and the network plan used by the user are the cause of network issue.
- Quality of the material using which the device is made up of plays a vital role in the capability of the device to work in harsh environment.

6. BEHAVIOUR:

- Network issue is very common as most of the industries are located at the country side. Here they contact both the developers and the service providers.
- Harsh environment is prevailing only on certain industry; thus the frequency of the said problem is low. In such a case the customer complaints multiple times to get the attention.

4. REQUIREMENT ANALYSIS:

4.1 FUNCTIONAL REQUIREMENTS:

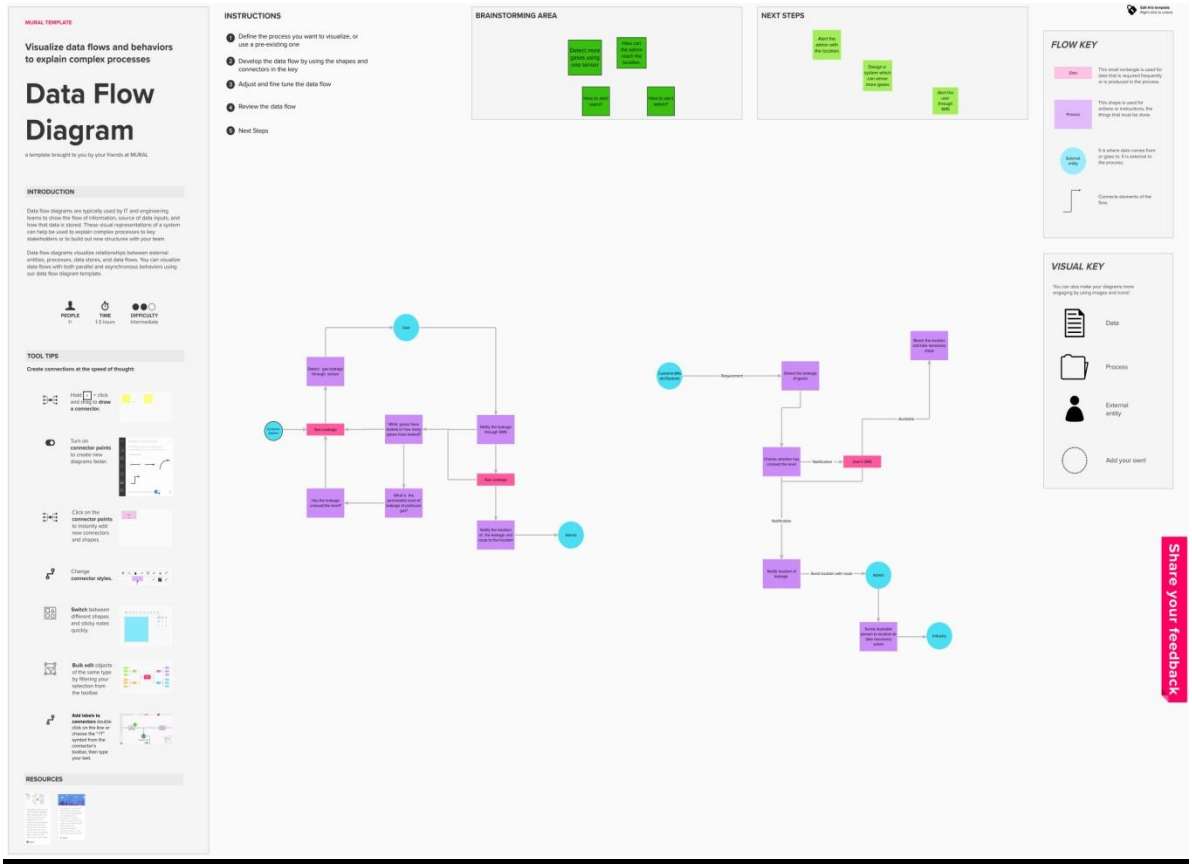
FR NO.	FUNCTIONAL REQUIREMENT	SUB. REQUIREMENT
FR-1	User Registration	• Registration through form. • Online payment for the service.
FR-2	User Access	• Access the details using web browser. • Access the details using mobile application.
FR-3	User Alert	• Get an alert through SMS message. • Get an alert through an alarm in the working area.

4.2 NON-FUNCTIONAL REQUIREMENTS:

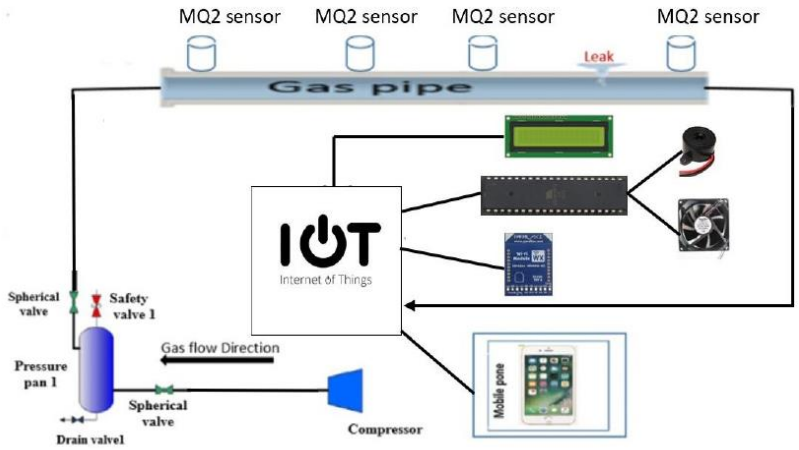
NFR NO.	NON-FUNCTIONAL REQUIREMENT	DESCRIPTION
NFR-1	Usability	The device must be usable by the customer anywhere at any time.
NFR-2	Security	Data from the sensors are stored securely and away from other data.
NFR-3	Reliablity	Data can be retrieved anytime and no data is discarded without the customer knowledge.
NFR-4	Performance	No performance delay in case of large number of data or more parameters.
NFR-5	Availability	The device does not fails even under the harsh conditions. Device continuous to send parameters, even after an alert situation.
NFR-6	Scalability	Device must be capable of measuring conditions even in a large industry.

5. PROJECT DESIGN:

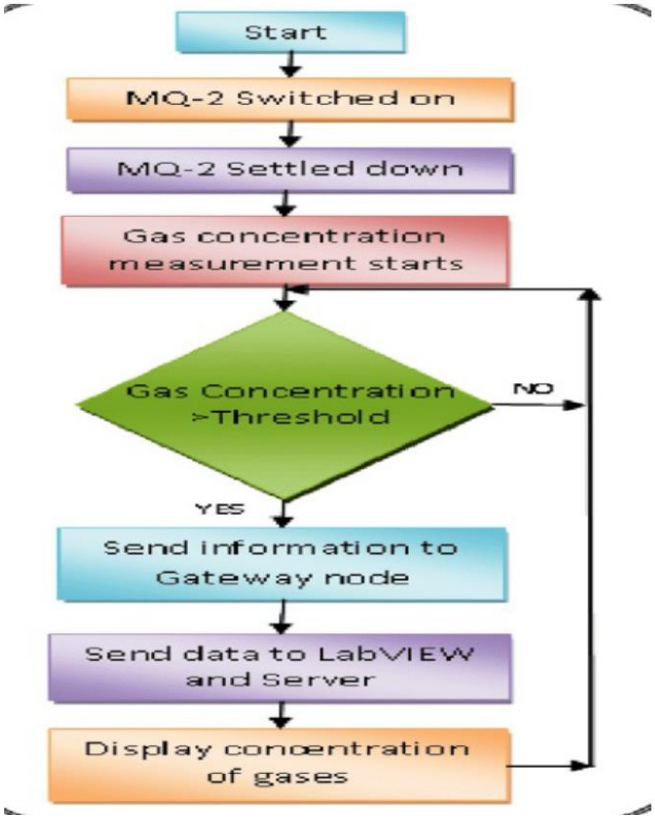
5.1 DATA FLOW DIAGRAM:



5.2 SOLUTION ARCHITECUTRE:



TECHNICAL ARCHITECTURE:



5.3 USER STORIES:

USER TYPE	FUNCTIONAL REQUIREMENTS	USER STORY NUMBER	USER STORY/TASK	ACCEPTANCE CRITERIA	PRIORITY	RELEASE
Customer (Mobile user, web user, care executive, Administrator)	Registration	USN-1	As a user, I can register for the application by entering my mail, password and confirming my password.	I can access my account/dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation e-mail once I have registered for the application	I can receive confirmation e-mail and click confirm	High	Sprint-1
	Dashboard	USN-3	As a user, I will receive confirmation e-mail once I have registered for the application	I can receive confirmation e-mail and click confirm	High	Sprint-1

		USN-4	As a user, I can register for the application through G-mail.	I can confirm the registration in G-mail.	Medium	Sprint-1
	Login	USN-5	As a user, I can login to the application by entering email and password	I can login with my ID and password.	High	Sprint-1

6. PROJECT PLANNING AND SCHEDULING:

6.1 SPRINT PLANNING & ESTIMATION:

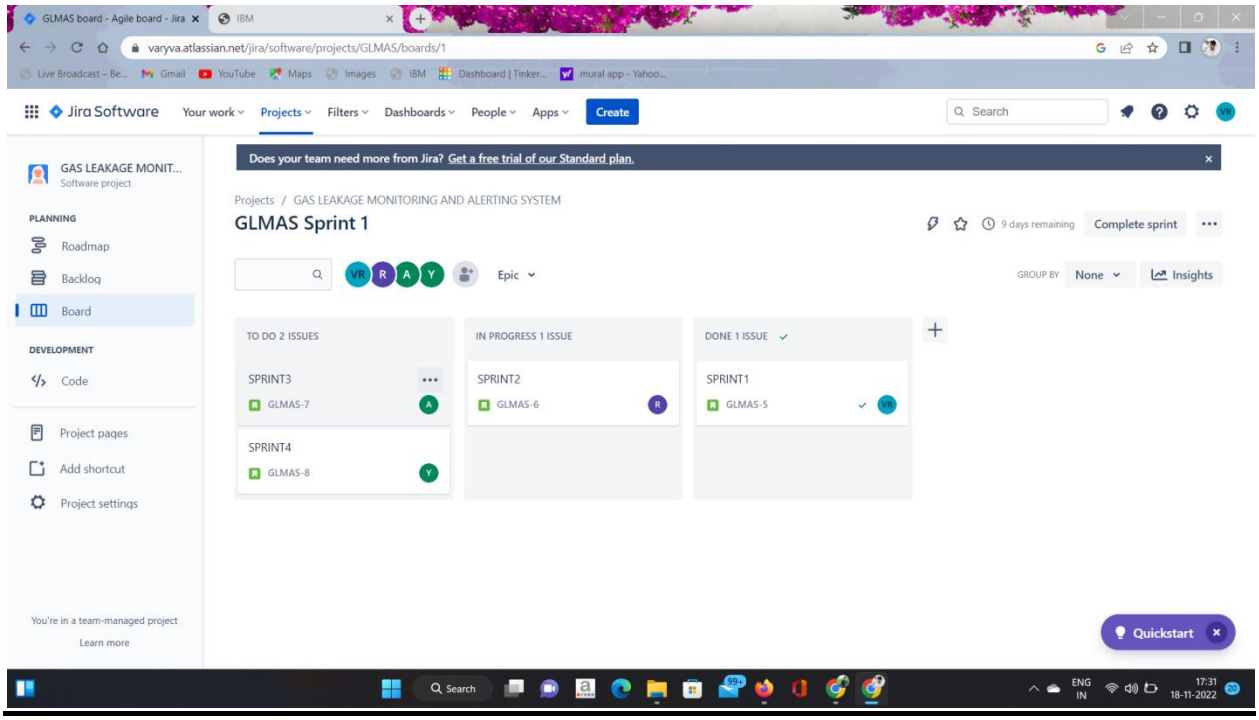
Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Objective	USN-1	As a system, the gas sensor should detect the gas	8	High	Vigneshwaran Ajay
Sprint-1	Features	USN-2	As a system, the gas sensor values should be displayed in a LED screen	2	Low	Yuvadharshini Rashmika
Sprint-1	Features	USN-3	As a system, as soon as the detected gas reaches the threshold level, the red color LED should be turned ON.	5	High	Vigneshwaran Yuvadharshini
Sprint-1	Features	USN-4	As a system, as soon as the detected gas reaches the threshold level, the siren should be turned ON.	5	High	Rashmika Ajay
Sprint-2	Focus	USN-5	As a system, it should the send the location where the gas is detected	8	High	Vigneshwaran Rashmika
Sprint-2	Focus	USN-6	As a system, it should also send the alerting SMS to the registered phone number	2	Low	Yuvadharshini Ajay
Sprint-2	Features	USN-7	As a system, the gas leakage pipe should be closed automatically once there it attains the threshold value	5	Medium	Yuvadharshini Ajay
Sprint-2	Features	USN-8	As a system, it will indicate that the gas leakage pipe is closed in the LCD screen and send SMS to the registered mobile number.	5	Medium	Ajay Vigneshwaran
Sprint-3	Data Transfer	USN-9	As a program, it should retrieve the API key of the IBM cloud to send the details of the system.	2	Low	Ajay Rashmika
Sprint-3	Data Transfer	USN-10	As a system, it should send the data of sensor values along with latitudes and longitudes to the IBM cloud	5	Medium	Ajay Yuvadharshini
Sprint-3	Data Transfer	USN-11	As a cloud system, the IBM cloud should send the data to NodeRed	2	Medium	Rashmika Vigneshwaran
Sprint-3	Data Transfer	USN-12	As a system, it should collect the data from the NodeRed and give it to the backend of the mit app.	3	Medium	Yuvadharshini Rashmika
Sprint-3	Data Transfer	USN-13	As an application, it should display the details of the gas level and other details to the user through the frontend of the mit app.	8	High	Rashmika Vigneshwaran
Sprint-4	Registration	USN-14	As a user, I must first register my email and mobile number in the website	2	High	Vigneshwaran Yuvadharshini

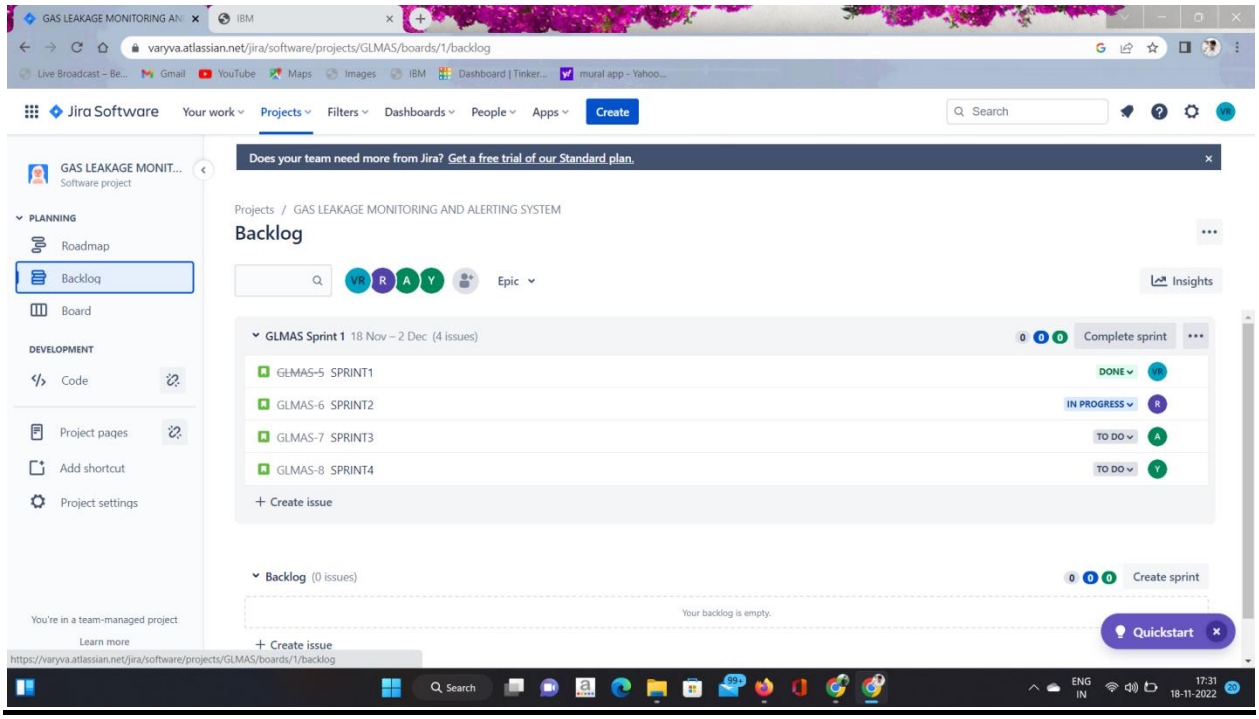
Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-4	Registration	USN-15	As a user, I must receive confirmation mail and SMS on registration	2	Medium	Ajay Yuvadharshini
Sprint-4	Login	USN-16	As a user, I can login into the web application through email and password.	3	High	Vigneshwaran Rashmika
Sprint-4	Dashboard	USN-17	As a user, I can access the dashboard and make use of available resources.	2	Medium	Yuvadharshini Rashmika
Sprint-4	Focus	USN-18	As a user, I must receive an SMS once the leakage is detected.	5	High	Ajay Vigneshwaran
Sprint-4	Allocation	USN-19	As an admin, I must receive information about the leakage along with location and share exact location and route to the person.	3	High	Yuvadharshini Vigneshwaran
Sprint-4	Allocation	USN-20	As an admin, I must allot particular person to look after the leakage in a particular location.	3	High	Ajay Yuvadharshini

6.2 SPRINT DELIVERY SCHEDULE:

TITLE	DESCRIPTION	DATE
Literature Survey on The Selected Project and Information Gathering	A Literature Survey is a compilation summary of research done previously in the given topic. Literature survey can be taken from books, research paper online or from any source.	3rd September 2022
Prepare Empathy Map	Empathy Map provides easy wayfor team to initialize and better understand the target users.	10th September 2022
Ideation-Brainstorming	Brainstorming is a activity that willhelp to generate more innovative ideas. The process of coming up with new ideas.	17th September 2022
Define Problem Statement	A Problem Statement is a concise description of the problem or issue to be addressed or conditions to be improved. The problem statement identifies the gap between the problem state and desired state of the process.	18th September 2022
Problem Solution Fit	The problem solution fit helps us to understand the thoughts of the customer about certain job, pain, gain like behaviors and emotions.	1st October 2022
Proposed Solution	Proposed solution shows relate the current solution to desired results and describe the benefit that will accrue when the desired result is achieved.	24th September 2022
Solution Architecture	Solution Architecture is helps toensure that a new system will fitthe existing enterprise environment. It helps To understand that features to complete our project.	1st october 2022

6.3 REPORTS FROM JIRA:




GAS LEAKAGE MONITORING AN
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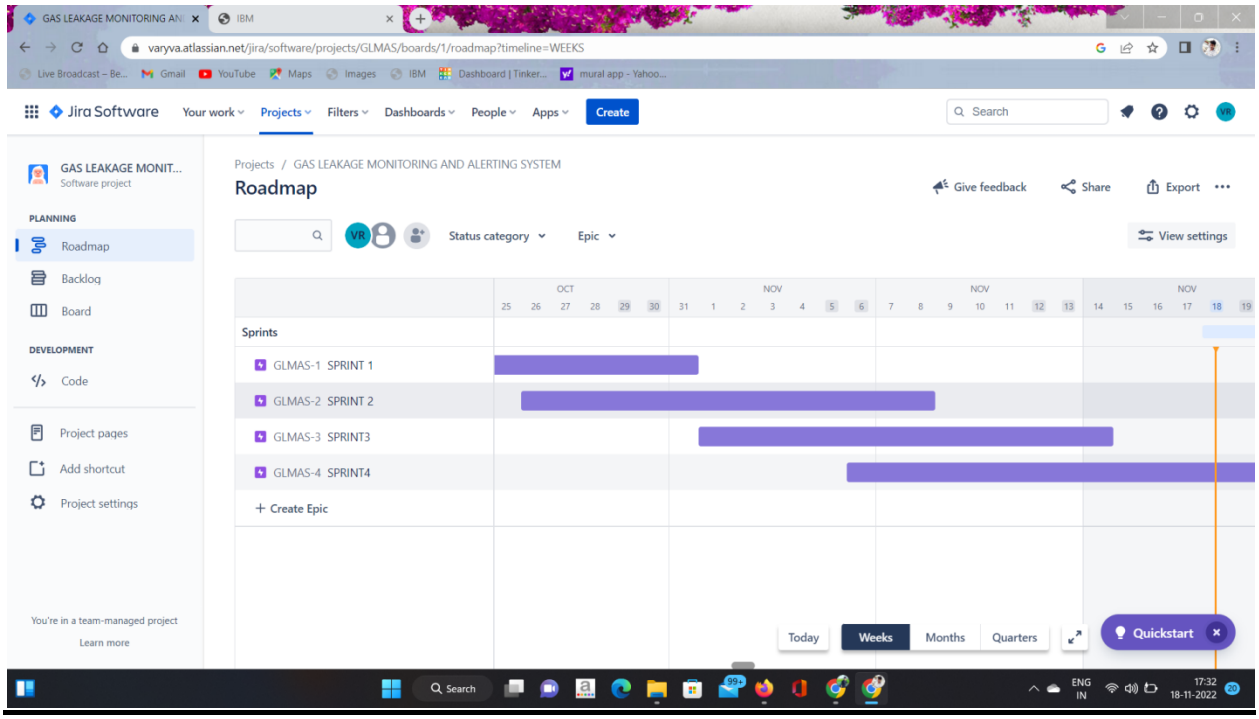
Jira Software
Your work
Projects
Filters
Dashboards
People
Apps
Create
Search
GAS LEAKAGE MONIT...
Software project
PLANNING
Roadmap
Backlog
Board
DEVELOPMENT
Code
Project pages
Add shortcut
Project settings
You're in a team-managed project
Learn more
Does your team need more from Jira? Get a free trial of our Standard plan.
Projects / GAS LEAKAGE MONITORING AND ALERTING SYSTEM
Backlog
Epic
Insights
GLMAS Sprint 1 18 Nov – 2 Dec (4 issues)
Complete sprint
GLMAS-5 SPRINT1
DONE
GLMAS-6 SPRINT2
IN PROGRESS
GLMAS-7 SPRINT3
TO DO
GLMAS-8 SPRINT4
TO DO
Create issue
Backlog (0 issues)
Create sprint
Your backlog is empty.
Create issue
Quickstart
https://varyva.atlassian.net/jira/software/projects/GLMAS/boards/1/backlog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Create
Search
GAS LEAKAGE MONIT...
Software project
PLANNING
Roadmap
Backlog
Board
DEVELOPMENT
Code
Project pages
Add shortcut
Project settings
You're in a team-managed project
Learn more
Projects / GAS LEAKAGE MONITORING AND ALERTING SYSTEM
Roadmap
Give feedback
Share
Export
Status category
Epic
View settings
OCT
NOV
NOV
NOV
Sprints
GLMAS-1 SPRINT 1
GLMAS-2 SPRINT 2
GLMAS-3 SPRINT3
GLMAS-4 SPRINT4
Create Epic
Today
Weeks
Months
Quarters
Quickstart

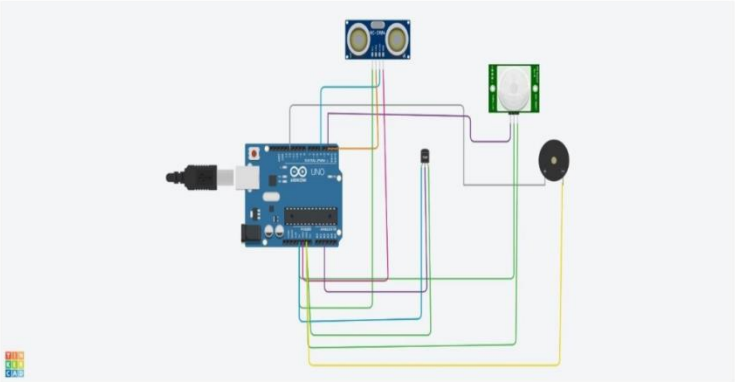
7. CODING AND SOLUTIONING:

7.1 FEATURE:

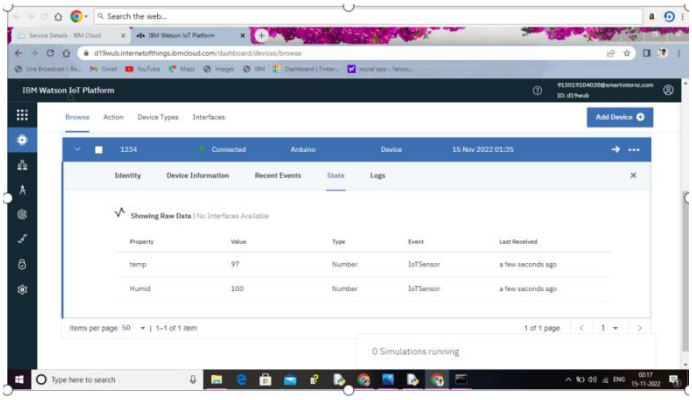
- We can get the real-time alerts about the gaseous presence in the atmosphere.
- It prevents the fire hazards and explosions.
- We can easily supervise gas concentration levels.
- It ensures workers health.
- It gives real time updates about leakages.
- It is cost-effective installation.
- It provides data analytics for improved decisions.
- It measures oxygen level accurately.
- We can get immediate gas leakage alerts.

8. TESTING:

8.1 TEST CASES:



8.2 USER ACCEPTANCE TESTING:



9. RESULTS:

9.1 PERFORMANCE METRICS:

Gas leakage alerting differs from many areas measured because success results in the absence of an outcome (injuries, property damage, business disruption, etc) rather than a presence. As such, measuring fire safety is not easy and there is no simple answers to achieve this. The key to effective selection and measurement of gas leakage performance indicators is the quality of the performance standards and specifications that have been established. Performance indicators for reviewing overall performance can then be developed based on active and reactive measure that includes

:

- Assessment of the degree of compliance with gas leakage monitoring safety system requirements.
- Identification of areas where the gas leakage monitoring system is absent or inadequate.
- Assessment of the achievement of specific objectives and plans within organizational policies and codes of practice
- Gas and near miss data accompanied by analysis of immediate and underlying causes, trends and common features.

In other words, performance metrices should be answering questions in relation to where the organization stands in terms of aims and objectives and risk control, along with the effectiveness, reliability, efficiency and proportionality of the management system. Indicators should also be able to indicate whether performance is getting better or worse and how well the organizational culture supporting implementation.

10. ADVANTAGES:

- **Gas leakage provides early detection:**

  The major benefit is the early detection of gas. The earlier the gas gets detected, the faster the gas leakage will be informed and further, they'll work to stop it. The latest gas alarm systems also have the feature of automatically calling the emergency services as well as key contacts to decrease the time it usually takes for the gas brigade to reach the site.

- **They provide insurance discounts:**

  Gas management can save your money on your house insurance to a large extent. Many of the homeowner policies provide amazing discounts to customers who have these systems in their home. This is because it can be possible to save a house rather than to lose it completely.

- **They monitor for 24/7:**

  A gas monitoring system provides homeowners with 24/7 protection all through the day. The entire home is monitored when you are away and also at night when you are fast asleep. This benefit gives homeowners a secure feeling as they know that the monitor never stops. However, to attain all these benefits, it is very important to choose the right gas protection company that can provide you with the best quality and durable gas alarms.

DISADVANTAGES:

- **False Alarm:**

  These security systems are prone to false alarms that involve the alarm ringing when anyone from your family enters the restricted area. Or there are instances when the alarm is triggered by itself without any reason.

- **Expensive:**

  Both, wireless and hardwired alarm systems are expensive to install. They require an initial investment, which includes equipment cost, installation, and subscription of security monitoring service.

- **Usage of batteries:**

  The life of the batteries in the detectors & I/O modules, especially the older models & even more so if the distance from the field device to the panel or repeater is too far. When the distance is too far, the radio transceiver in the detector uses maximum transmitter power.

11. CONCLUSION:

After this project performance, can conclude that detection of the LPG gas leakage is incredible in the project system. Applicable usefully in the industrial and domestic purpose. In danger situations we are able to save the life by using this system. An alert is indicated by the GSM module. A sensor node senses gas like CO2, oxygen, propane. The estimated range of transmission and consumption of power is obtained. The simple procedures and Raspberrypi UNO Micro controller area used to build the sensor.

13. APPENDIX:

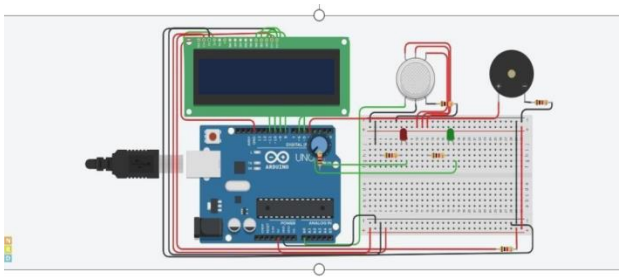
SOURCE CODE:

```
import time
import sys
import ibmiotf.application
import ibmiotf.device
import random

#Provide your IBM Watson Device Credentials
organization = "ge3f42"
deviceType = "raspberypi"
deviceId = "1234"
authMethod = "token"
authToken = "K@64_8HhZ40XrO0jDQ"

# Initialize GPIO
def myCommandCallback(cmd):
    print("Command received: %s" %
cmd.data['command'])
    status=cmd.data['command']
    if status=="lighton":
        print ("led is on")
    elif status == "lightoff":
        print ("led is off")
    else :
        print ("please send proper command")


try:
```

```
        deviceOptions = {"org":
organization, "type": deviceType, "id":
deviceId, "auth-method": authMethod, "auth-
token": authToken}
        deviceCli =
ibmiotf.device.Client(deviceOptions)
#.....................................
...

except Exception as e:
   print("Caught exception connecting : %s"
% str(e))
   sys.exit()

# Connect and send a datapoint "hello" with
value "world" into the cloud as an event of
type "greeting" 10 times
deviceCli.connect()

while True:
        #Get Sensor Data from DHT11

        temp=random.randint(90,110)
        Humid=random.randint(60,100)

        data = { 'temp' : temp, 'Humid':
Humid }
        #print data
        def myOnPublishCallback():
            print ("Published Temperature =
%s C" % temp, "Humidity = %s %%" % Humid,
"to IBM Watson")
```

```
        success =
deviceCli.publishEvent("IoTSensor", "json",
data, qos=0, on_publish=myOnPublishCallback)
        if not success:
            print("Not connected to IoTF")
        time.sleep(10)

        deviceCli.commandCallback =
myCommandCallback

# Disconnect the device and application from
the cloud
deviceCli.disconnect()
```

OUTPUT:



GITHUB LINK:

https://github.com/IBM-EPBL/IBM-Project-27397-1660055106