PROJECT REPORT

1. **INTRODUCTION**
   1. PROGECT OVERVIEW**:**

The usage of the gas brings great problems in the domestic as well as working places. The inflammable gas such as Liquidized petroleum gas (LPG), which is excessively used in the house and at work places. The leakage of the gas causes destructible impact to the lives and as well as to the heritage of the people. So, by keeping it in the concept of the project we have determined to develop an examining system which finds the leak of LPG gas and protects the work places by taken correct precaution at correct time. This system provides the information such as when a gas leakage is noticed, sensors of in the project are used to notice the gas leakage and immediately turns ON the buzzer for the danger indication. Buzzer is a clear indication of gas leakage. By the detection of the hazardous gas the alerting message reached to the person who has control over it from the GSM. Detection of the gas leakage is important and halting leakage is important equally. The main objective of this project is that it is extremely accurate with a least cost, this project system is best to detect gas leakage and also warn people around by buzzer beep sound and an SMS is been send to the responsible person for preparatory safety calculations.

* 1. PURPOSE:

There are much uses of fuels, gases, etc. in our day-to-day life such as in households, industries, etc. But it can cause vital issues if not used carefully. It was the only cause of many accidents in the past. The purpose of this project is to detect a gas leak and prevent the accident and blocking of gas leaks in vulnerable area

**2. LITERATURE SURVAY**

**2.1 EXISTING PROBLEM:**

At present day we come across various incidents about gas leakages and industrial accidents which cost the life of the workers, people staying nearby the industry and other animals. The Bhopal gas leak incident which took the life of at least 3787 people and recently the Visakhapatnam gas leak which took the life of at least 11 people are examples of hazardous industrial gas leaks. There are many systems and methodologies for the gas detection and prevention but many of them are not efficient and are lacking the features to alert about an incident in real time.

**2.2 REFERENCES:**

1] A. Banik, B. Aich and S. Ghosh, "Microcontroller based low cost gas leakage detector with SMS alert," 2018 Emerging Trends in Electronic Devices and Computational Techniques (EDCT), Kolkata, 2018, pp. 1-3, doi: 10.1109/EDCT.2018.840509

[2] A. Varma, Prabhakar S and K. Jayavel, "Gas Leakage Detection and Smart Alerting and prediction using IoT," 2017 2nd International Conference on Computing and Communications Technologies (ICCCT), Chennai, 2017, pp. 327-333, doi: 10.1109/ICCCT2.2017.7972304.

[3] M. B. Yassein, M. Q. Shatnawi, S. Aljwarneh and R. AlHatmi, "Internet of Things: Survey and open issues of MQTT protocol," 2017 International Conference on Engineering & MIS (ICEMIS), Monastir, 2017, pp. 1-6, doi: 10.1109/ICEMIS.2017.8273112.

[4] A. F. Oklilas, R. Zulfahmi, Ermatita and A. P. Jaya, "Temperature Monitoring System Based on Protocol Message Queue Telemetry Transport (MQTT)," 2019 International Conference on Informatics, Multimedia, Cyber and Information System (ICIMCIS), Jakarta, Indonesia, 2019, pp. 61-66, doi: 10.1109/ICIMCIS48181.2019.8985356.

[5] Kumar Keshamoni and Sabbani Hemanth. "Smart Gas Level Monitoring, Booking & Gas Leakage Detector over IoT " International Advance Computing Conference IEEE, 2017.

[6] Petros Spachos , Liang Song and Dimitrios Hatzinakos. "Gas Leak Detection and Localization System Through Wireless Sensor Networks" The 11th Annual IEEE Consumer Communications and Networking Conference - Demos. IEEE, 2014.

[7] Babuprasanth.V. “Cloud Connected Smart Gas Leakage Detection And Safety Precaution System" International Journal of MC Square Scientific Research Vol.6, No.1 Nov 2014.

[8] Asmita Varma, Prabhakar S, Kayalvizhi Jayavel. “Gas Leakage Detection and Smart Alerting and Prediction Using IoT." Internet of Things and Applications (IOTA), International Conference on. IEEE, 2017

[9] Mohammad Reza Akhondi, Alex Talevski, Simon Carlsen, Stig Petersen. “Applications of Wireless Sensor Networks In the Oil, Gas And Resources Industries." International Conference On Advanced Information Networking And Applications, IEEE 2010

[10] Ashish Shrivastava, Ratnesh Prabhaker, Rajeev Kumar and Rahul Verma “Gsm Based Gas Leakage Detection System." International Journal Of Technical Research And Applications EISSN: 2320-8163

[11]Tyler Kersnovski, Felipe Gonzalez, Kye Morton. "A UAV System For Autonomous Target Detection And Gas Sensing." Yellowstone Conference Center, Big Sky, Montana, IEEE 2017 [Magno, Davide -October 198.

**2.3 PROBLEM STATEMENT DEFINITION:**

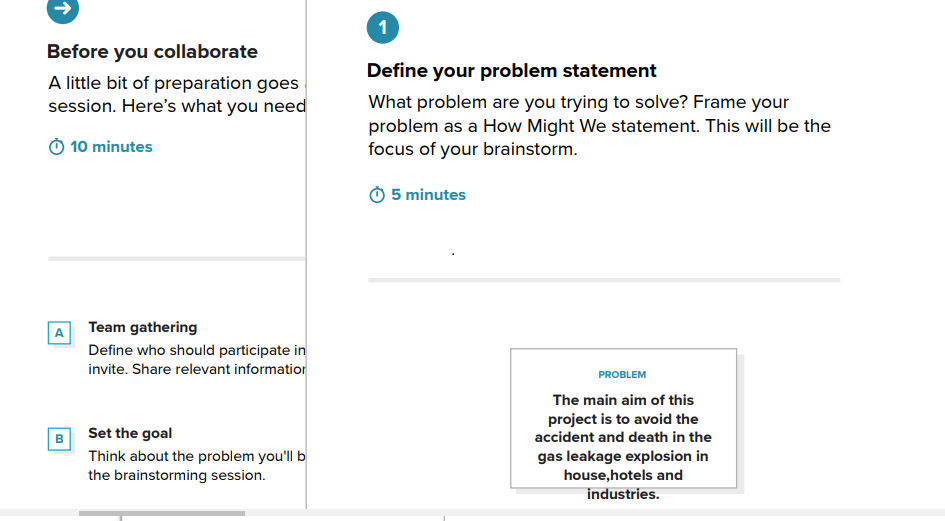
Liquid Petroleum Gas (LPG) is a highly flammable chemical that consists of mixture of propane and butane. LPG is used for cooking at home, restaurant, and certain use for industry. They have certain weaknesses that make the gas leakage occur. The leakage of gases only can be detected by human nearby and if there are no human nearby, it cannot be detected. But sometimes it cannot be detected by human that has a low sense of smell. Thus, this system will help to detect the presence of gas leakage.Furthermore, gas leakage can cause fire that will lead to serious injury or death and it also can destroy human properties. This system was developed by using IoT to give real-time response to the user and the nearest fire station.

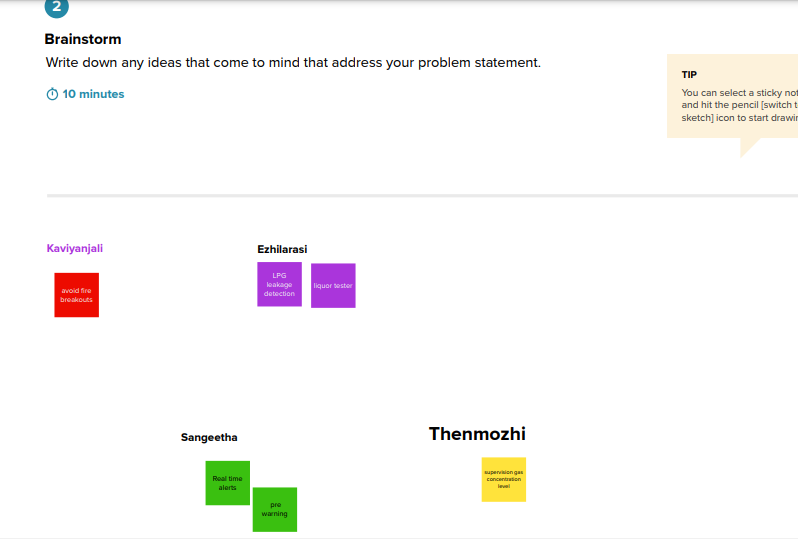
IDEATION & PROPOSED SOLUTION:

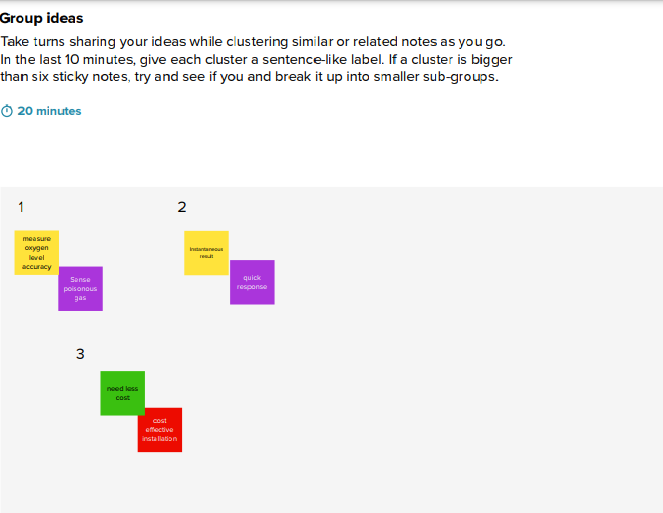
**3.1 Empathy map canvas**

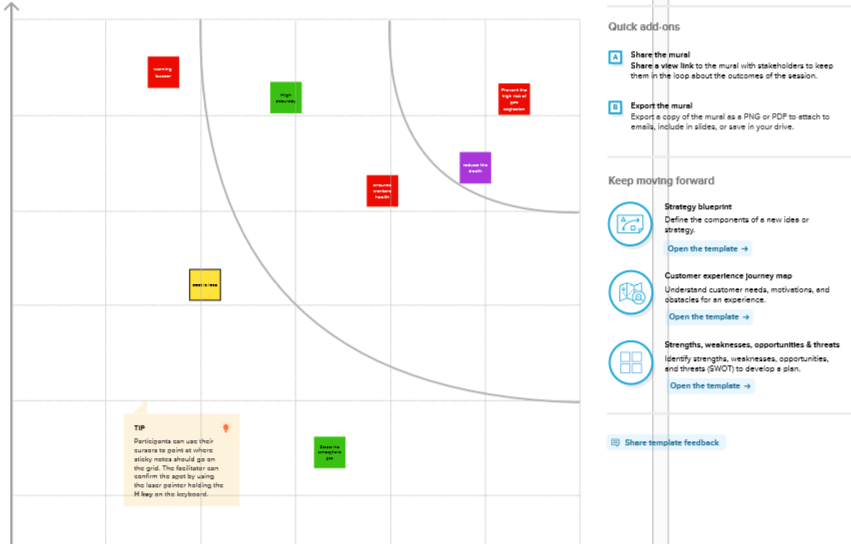
****

**3.2 Ideation and Brainstorming:**

****

****

****

****

**3.3 Proposed solution**

|  |  |  |
| --- | --- | --- |
| S.NO | PARAMETER | DESCRIPTION |
| 1 | Problem Statement (Problem to be solved) | Gas leakage leads to various accidents resulting into both financial loss as well as human injuries. In human's daily life, environment gives the most significant impact to their health issues. The poisioness gas in the the atmosphere will cause the human and I will be burnt. |
| 2 | Idea / Solution description | OT gas leakage detector, device will get connected to WIFI, the minimum and maximumparameter can be set accordingly. Such IOTas well as Arduino based gas leakage detector systems can be installed in homes, hotels LPGgas storage areas. In this LPG gas detector system senses the LPG gas using gas sensor.This device will continuously monitor the level of LPG gas present in the air. While monitoring, if the value of LPG gas in air is within the set limit then the LED on the circuit will glow green giving a safe sign. And whenever the gas exceeds above the predefine limit than the LED will glow red and simultaneously solenoid value will turn off and update it over IOT. This Arduino and IOT project will help in detecting gas leakage in the surrounding. |
| 3 | Novelty / Uniqueness | 1.Get real-time alerts about the gaseous presence in the atmosphere  2.Prevent fire hazards and explosions Supervise gas concentration levels  3.Ensure worker’s health  4.Real-time updates about leakages  5.Cost-effective installation 6.Data analytics for improved decisions  7.Measure oxygen level accuracy  8.Get immediate gas leak alerts |
| 4 | Social Impact / Customer Satisfaction | The Internet of Things is increasingly finding place at the heart of many business automation strategies. Companies are using sensors in the logistics chain to help them track where delivery is with incredible accuracy. |
| 5 | Business Model (Revenue Model) | The GSM is Remote Management , Speed, Super-Fast Deployment. |
| 6 | Scalability of the Solution | The advantage of this simple gas leak detector is its simplicity and its ability to warn about the leakage of the LPG gas . This system uses GSM technique to send alert massage to respective person if no one is there in the house and then gas leaks occurs, GSM module is there to send immediate messages to the respective person regarding the gas leak . The main advantage of this system is that it off the regulator knob of the cylinder automatically when gas leakage detected |

**3.4 Proposed solution fit**

4. Requirement analysis

**4.1 Functional requirement**

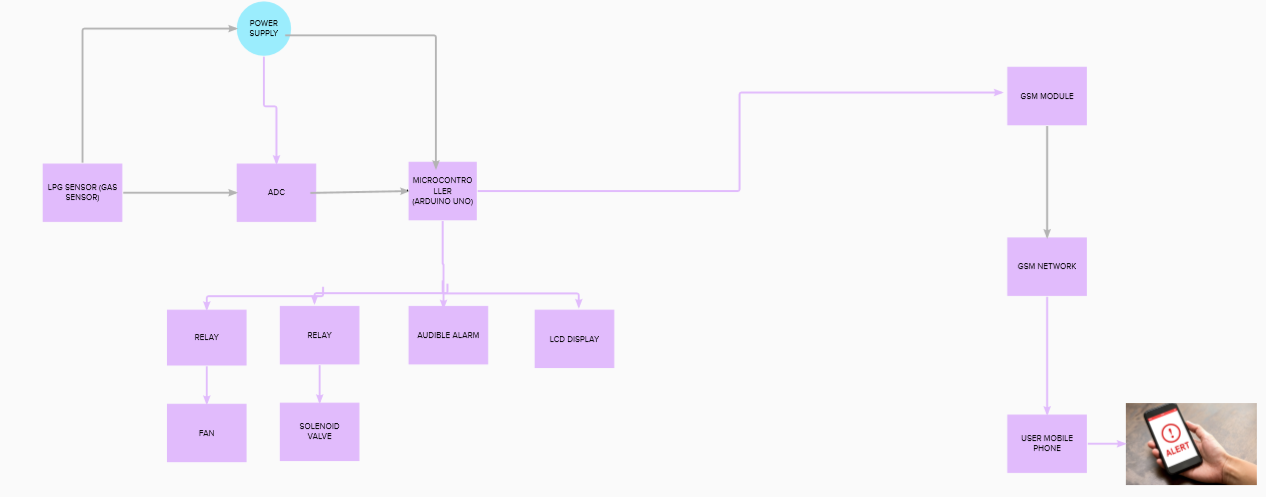
|  |  |  |
| --- | --- | --- |
| F.NO | Functional Requirement (Epic) | Sub Requirement(Story/Sub-Task) |
| FR 1 | Problem Statement(Problem to be solved) | Gasleakageleadstovariousaccidentsresultingintobothfinanciallossaswellashumaninjuries.Inhuman'sdailylife,environmentgivesthemostsignificantimpacttotheirhealthissues.ThepoisionessgasinthetheatmospherewillcausethehumanandIwillbeburnt. |
| FR 2 | Idea/Solution description | IOT gas leakage detector, device will get connected to WIFI, the minimum and maximum parameter can be setaccordingly.SuchIOTaswellasArduinobasedgasleakagedetectorsystemscanbeinstalledinhomes,hotelsLPGgasstorageareas.InthisLPGgasdetectorsystemsensestheLPGgasusinggassensorThisdevicewillcontinuouslymonitorthelevelofLPGgaspresentintheair.Whilemonitoring,ifthevalueofLPGgasinairiswithinthesetlimitthentheLEDonthecircuitwillglowgreengivingasafesign |
| FR 3 | Novelty/Uniqueness | 1.Getrealtimealertsaboutthegaseouspresenceinthe atmosphere 2.PreventfirehazardsandexplosionsSupervisegasconcentrationlevels  3.Ensureworker’shealth  4.Real-timeupdatesaboutleakages  5.Costeffectiveinstallation  6.Dataanalyticsforimproveddecisions  7.Measureoxygenlevelaccuracy  8.Getimmediategasleakalerts |
| FR 4 | Social Impact/Customer Satisfaction | TheInternetofThingsisincreasinglyfindingaplaceattheheartofmanybusinessautomationstrategies.CompaniesareusingsensorsinthelogisticschaintohelpthemBtrackwheredeliveryiswithincredibleaccuracy |
| FR 5 | Business Model(Revenue Model) | The GSM is Remote Management, Speed, Super Fas t Deployment. |
| FR 6 | Scalability of the Solution | TheadvantageofthissimplegasleakdetectorisitssimplicityanditsabilitytowarnabouttheleakageoftheLPGgas.ThissystemusesGSMtechniquetosendalertmassagetorespectivepersonifnooneisthereinthehouseandthengasleaksoccurs,GSMmoduleistheretosendimmediatemessagestotherespectivepersonregardingthegasleak.Themainadvantageofthissystemisthatitofftheregulatorknobofthecylinderautomaticallywhengasleakagedetected |
|  |  |  |

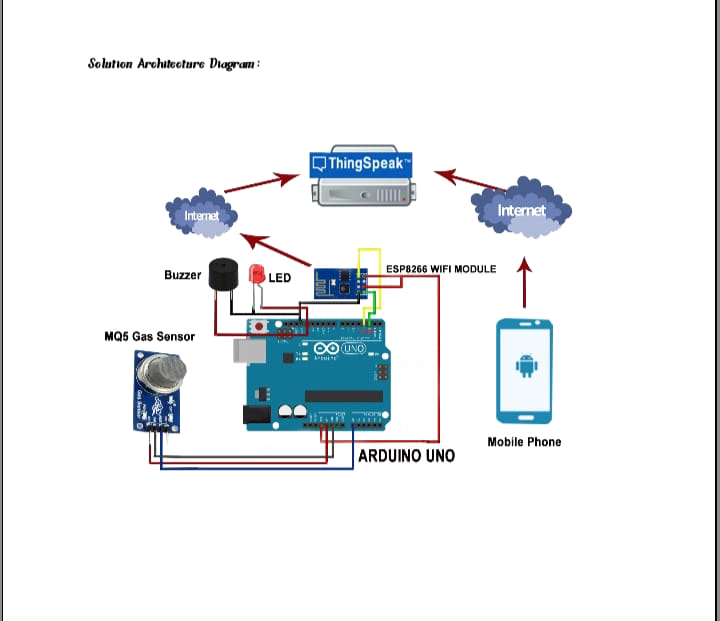
**4.2 Nonfunctional requirement**

|  |  |  |
| --- | --- | --- |
| FR NO | NON FUNCTIONAL REQUIRMENT | DESCRIPTION |
| FR 1 | Usability | Human factors, aesthetics, consistency, documentation. |
| FR 2 | Security | Thesecurityrequirementisparticularlyimportantwhenthesysteminvolveshandlingsensitivedata,suchaspersonalorfinancialinformation.TodefinetheseNFRs,it’simportanttofullyunderstandregulatoryandcompliancerequirementsfromtheverystartoftheprojectandclearlycommunicatethemtodevelopers |
| FR 3 | Reliability | Frequency/severityoffailure,recoverability,predictability,accuracy,meantimetofailure |
| FR 4 | Performance | Speed, efficiency, resource consumption, throughput, response time. |
| FR 5 | Availability | thistypeofnonfunctionalisconcernedwithcharacteristicssuchasmaintainability,scalabilityofthesolution.Thisincludesconsiderationsfortheabilityofthesolutiontobeeasilymodifiedtoaccommodateenhancementsandrepairs. |
| FR 6 | Scalability | Thelimitofmaximumattendanceofthewebsitemustbescalableenoughtosupport300.000visitsatthesametimewhilemaintainingoptimalperformance. |

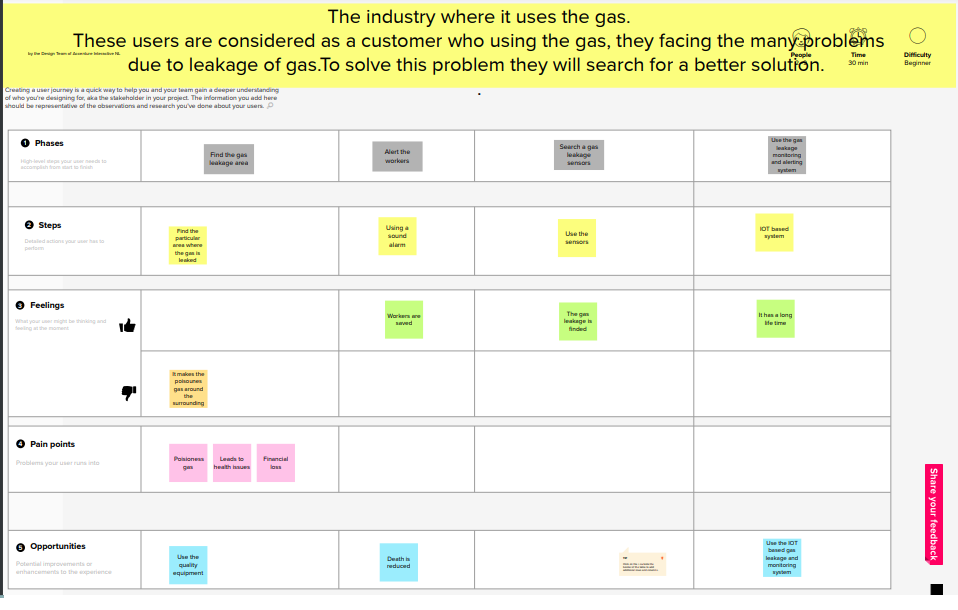
5. PROJECT DESIGN

5.1 Data flow diagram



**5.2 Solution & Technical Architecture**

**5.3 User Stories**



6. PROJECT PLANNING AND SCHEDULING

6.1 Sprint planning and estimation

**Product Backlog, Sprint Schedule, and Estimation (4 Marks)**

Use the below template to create product backlog and sprint schedule

| **Sprint** | **Functional Requirement (Epic)** | **User Story / Task** | **Story Points** | **Priority** | **Team Members** |
| --- | --- | --- | --- | --- | --- |
| Sprint-1 | Related work | Introduced GSM based gas leakage detection system in which the GSM module is introduced for wireless alert and gas leakage detection ,efficiently implemented. | 2 | High | KAVIYANJALI P  EZHILARASI S  SANGEETHA A  THENMOZHI S |
| Sprint-1 | Proposed method | Send alert SMS to the in charge of the plant whose number is saved in SIM card by using GSM modem. | 2 | High | KAVIYANJALI P  EZHILARASI S  SANGEETHA A  THENMOZHI S |
| Sprint-2 | Hardware description | Arduino UNO, Gas leakage sensor, GSM module, Buzzer, LCD these hardware are used to monitor and alerting purpose . | 1 | Low | KAVIYANJALI P  EZHILARASI S  SANGEETHA A  THENMOZHI S |
| Sprint-3 | Software implementation | This system monitors the gas, smoke by sensor. If any gas is detected the signal of sensor goes low and activate the Arduino UNO. This is send to LCD display. | 1 | Medium | KAVIYANJALI P  EZHILARASI S  SANGEETHA A  THENMOZHI S |
| Sprint-4 | Result and discussion | Buzzer and GSM modem alerts the people who are present in the danger place. | 2 | High | KAVIYANJALI P  EZHILARASI S  SANGEETHA A  THENMOZHI S |

6.2 SPRINT DELIVERY SCHEDULE

SPRINT 1:

ARDUINO UNO WITH SENSOR:

IN THE ABOVE CIRCUIT WE CONNECT THE ARDUINO UNO WITH SENSORS, BUZZER.

PROGRAM:

#include int reading=0;

Servo servo\_11;

void setup() { pinMode(12,INPUT);

pinMode(A0,INPUT);

pinMode(10,OUTPUT);

servo\_11.attach(11);

pinMode(A1,INPUT);

}

void loop()

{

if (digitalRead(12)==0) {

reading=analogRead(A0);

analogWrite(10,(reading\*0.18));

servo\_11.write((reading\*0.25));

} else {

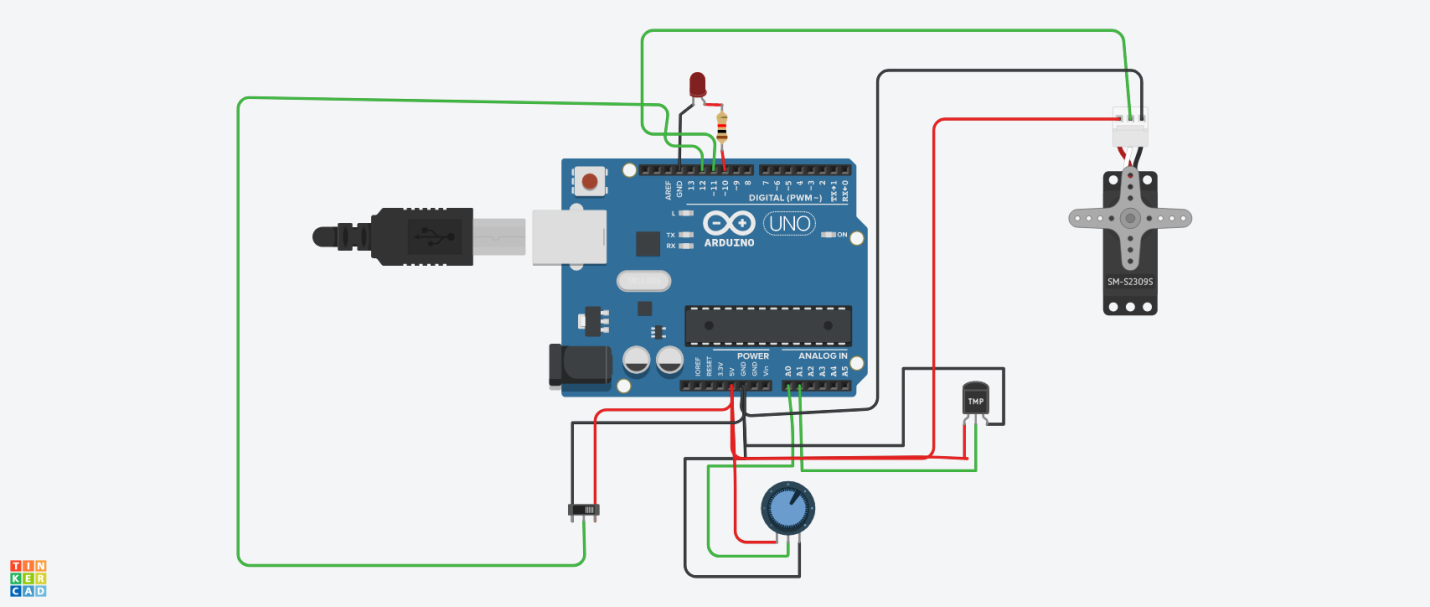
reading=analogRead(A1);

analogWrite(10,(reading\*0.75-15.09));

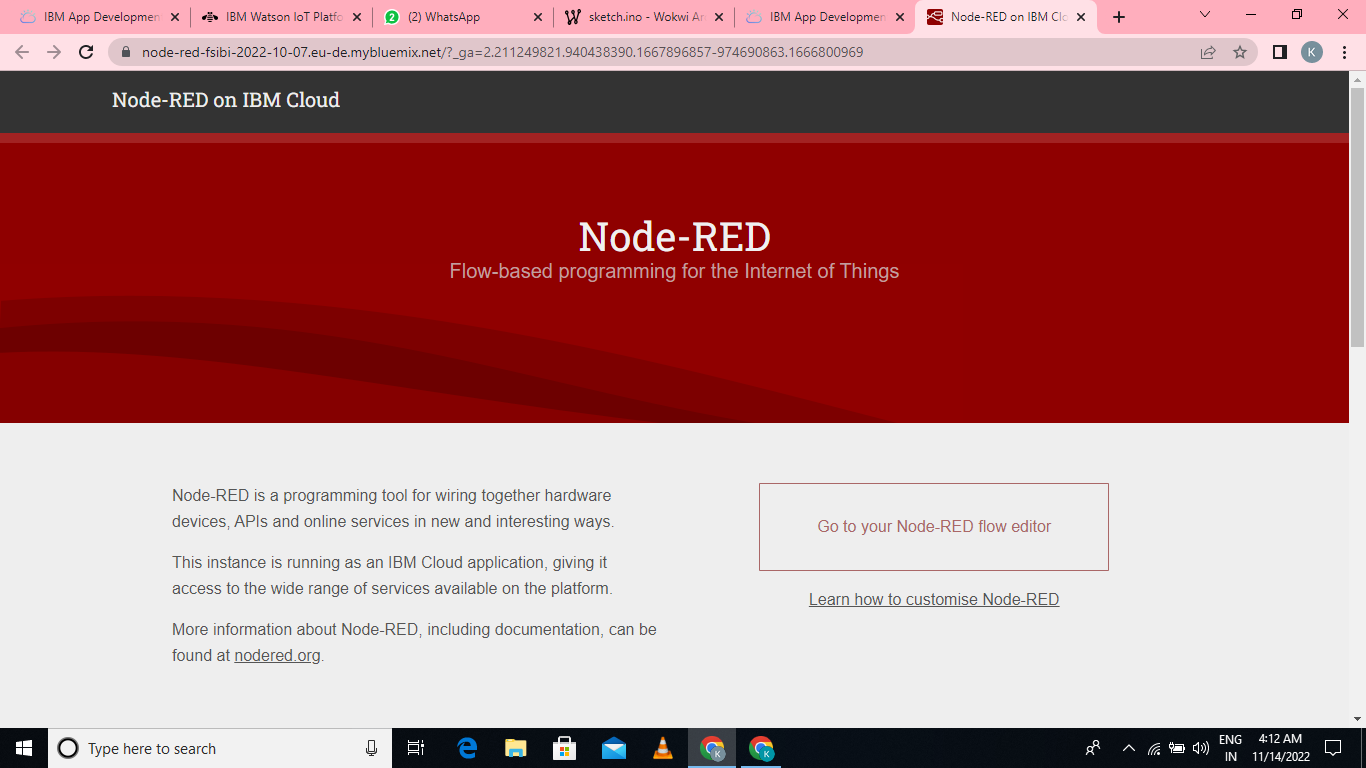
servo\_11.write((reading\*0.53-10.65));

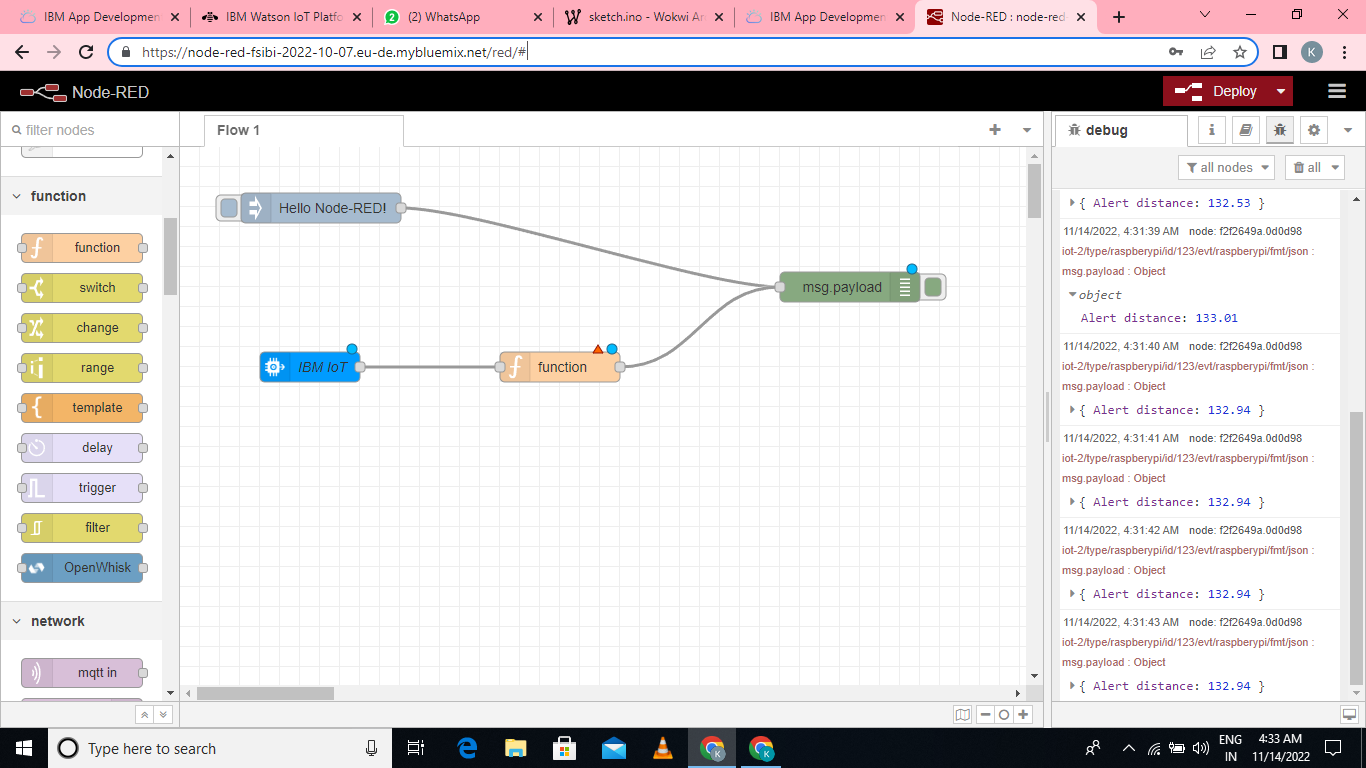
}

}



SPRINT 2:



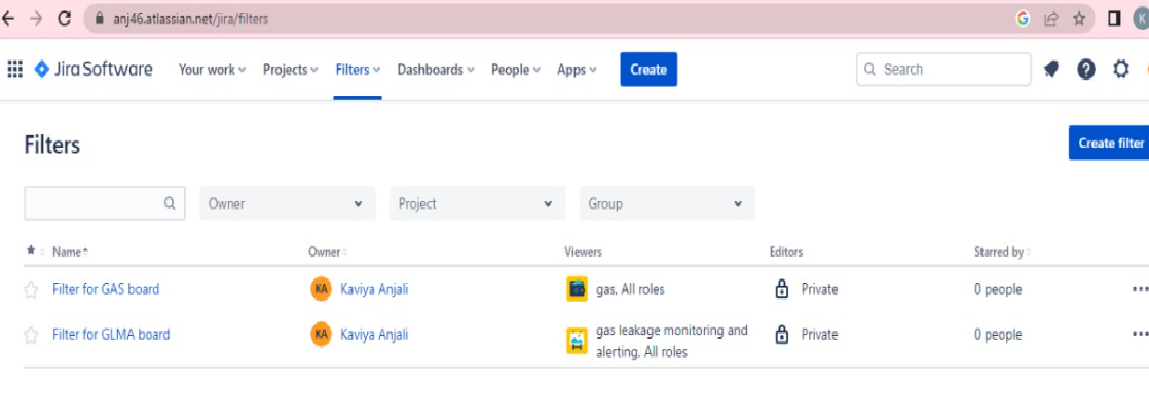


6.2 SPRINT DELIVERY SCHEDULE:

**Project Tracker, Velocity & Burn down Chart: (4 Marks)**

| **Sprint** | **Total Story Points** | **Duration** | **Sprint Start Date** | **Sprint End Date (Planned)** | **Story Points Completed (as on Planned End Date)** | **Sprint Release Date (Actual)** |
| --- | --- | --- | --- | --- | --- | --- |
| Sprint-1 | 20 | 6 Days | 24 Oct 2022 | 29 Oct 2022 | 20 | 29 Oct 2022 |
| Sprint-2 | 20 | 6 Days | 31 Oct 2022 | 05 Nov 2022 | 20 | 31 Oct 2022 |
| Sprint-3 | 20 | 6 Days | 07 Nov 2022 | 12 Nov 2022 | 20 | 7 Oct 2022 |
| Sprint-4 | 20 | 6 Days | 14 Nov 2022 | 19 Nov 2022 | 20 | 14 Oct 2022 |

**6.3 REPORT FROM JIRA**



7. CODING &SOLUTIONING

7.1 FEATURE 1:

#include <LiquidCrystal.h>

LiquidCrystal lcd(7, 6, 5, 4, 3, 2);

#include <SoftwareSerial.h>

SoftwareSerial mySerial(9, 10);

int gasValue = A0; // smoke / gas sensor connected with analog pin A1 of the arduino / mega.

int data = 0;

void setup()

{

randomSeed(analogRead(0));

mySerial.begin(9600); // Setting the baud rate of GSM Module

Serial.begin(9600); // Setting the baud rate of Serial Monitor (Arduino)

lcd.begin(16,2);

pinMode(gasValue, INPUT);

lcd.print (" Gas Leakage ");

lcd.setCursor(0,1);

lcd.print (" Detector Alarm ");

delay(3000);

lcd.clear();

}

void loop()

{

data = analogRead(gasValue);

Serial.print("Gas Level: ");

Serial.println(data);

lcd.print ("Gas Scan is ON");

lcd.setCursor(0,1);

lcd.print("Gas Level: ");

lcd.print(data);

delay(1000);

if ( data > 500) //

{

SendMessage();

Serial.print("Gas detect alarm");

lcd.clear();

lcd.setCursor(0,0);

lcd.print("Gas Level Exceed");

lcd.setCursor(0,1);

lcd.print("SMS Sent");

delay(1000);

}

else

{

Serial.print("Gas Level Low");

lcd.clear();

lcd.setCursor(0,0);

lcd.print("Gas Level Normal");

delay(1000);

}

lcd.clear();

}

void SendMessage()

{

Serial.println("I am in send");

mySerial.println("AT+CMGF=1"); //Sets the GSM Module in Text Mode

delay(1000); // Delay of 1000 milli seconds or 1 second

mySerial.println("AT+CMGS=\"+91900xxxxxxx\"\r"); // Replace x with mobile number

delay(1000);

mySerial.println("Excess Gas Detected. Open Windows");// The SMS text you want to send

delay(100);

mySerial.println((char)26);// ASCII code of CTRL+Z

delay(1000);

}

7.2. FEATURE 2:

**Working of the Project**

When the circuit is powered on after uploading code, the LCD displays the Gas Level in some analog numbers. It will display the status of whether the gas level is normal or This circuit triggers the alert system when smoke or gas leakage is detected. The circuit mainly uses the **MQ135 Smoke/Gas sensor and Arduino** to detect and smoke and gas leak. The sensor has excellent sensitivity combined with the quick response time. This low signal is monitored by the microcontroller and sends the signal to the GSM module Sim800 to send messages as “Excess Gas Detected. Open Windows” to a mobile number written in code.xcessive. When the gas level exceeds it will display SMS Sent status.

8. TESTING

8.1 TEST CASES:

●To verify the performance to create a gas leakage detection and alerting system for industries ●using GSM module (alerting system)

●TO verify scalability testing

●To verify security testing

●To verify usability testing

8.2 USER ACCEPTANCE TESTING

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| RESOLUTION | SEVETITY 1 | SEVERITY 2 | | SEVERITY 3 | SEVERITY 4 | SUBTOTAL |
| BY DESIGHN | 3 | 2 | | 6 | 2 | 13 |
| DUPLICATE | 0 | 2 | | 0 | 3 | 7 |
| EXTERNAL | 1 | 3 | | 2 | 5 | 11 |
| FIXED | 8 | 6 | | 5 | 4 | 23 |
| NOT REPRODUCED | 1 | 0 | | 0 | 0 | 1 |
| SKIPPED | 0 | 0 | | 0 | 0 | 0 |
| WON’T FIX | 3 | 5 | | 0 | 1 | 9 |
| TOTALS | 16 | 18 | 13 | | 15 | 57 |

1. Purpose of Document

The purpose of this document is to briefly explain the test coverage and open issues of the [ProductName] project at the time of the release to User Acceptance Testing (UAT)

1. Defect Analysis

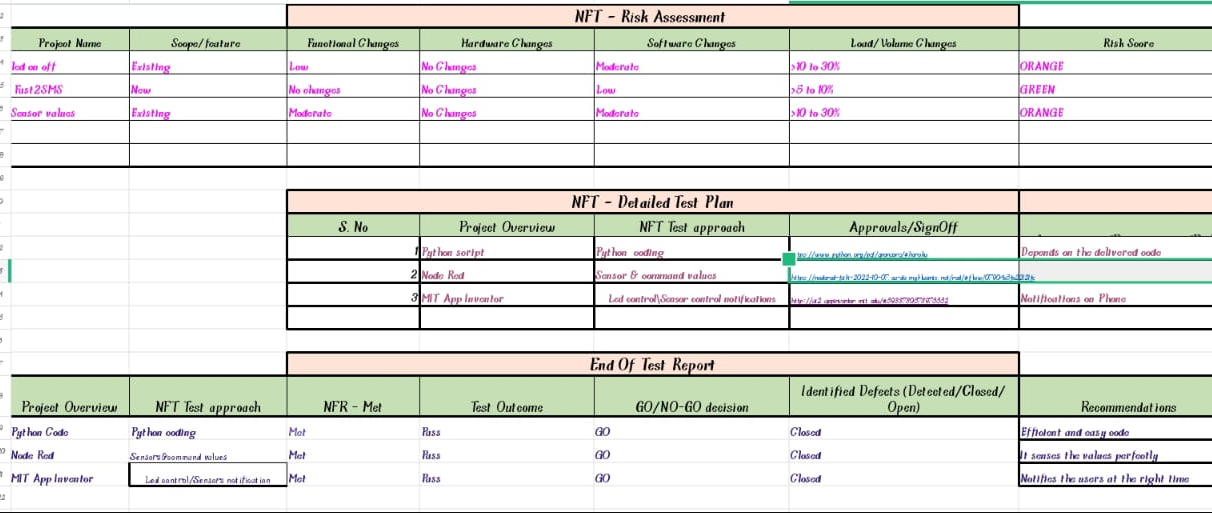
This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

1. Test Case Analysis: This report shows the number of test cases that have passed, failed, and untested.

| 1. **S.N.** | **COMPONENTS NAME** | **DESCRIPTION** | **QUANTITY** |  |
| --- | --- | --- | --- | --- |
| 1 | Arduino Board | Arduino UNO R3 Development Board | 1 | <https://amzn.to/3bjpPDS> |
| 2 | GSM Module | SIM800/900 UART GSM Module | 1 | <https://amzn.to/3cqDL06> |
|  |  |  |  |  |
| 3 | LCD Display | JHD162A 16x2 LCD Display | 1 | <https://amzn.to/2YVEF0W> |
| 4 | Potentiometer | 10K | 1 | <https://amzn.to/35Qrn7f> |
|  |  |  |  |  |
| 5 | Gas Sensor | MQ-135/MQ7/MQ6/MQ5/MQ2 | 1 | <https://amzn.to/2WLIPFL> |
|  |  |  |  |  |
| 6 | Arduino Power Supply | 5V DC Adapter | 1 | <https://amzn.to/3cnwUEI> |
|  |  |  |  |  |
| 7 | GSM Power Supply | 12V DC Adapter | 1 | <https://amzn.to/2yNfItP> |
| 8 | Connecting Wires | Jumper Wires | 20 | <https://amzn.to/2L8Xc1p> |

9. RESULTS

PERFORMANCE METRIX



10. ADVANTAGE AND DISADVANTAGE

The sensor-enabled solution **helps prevent the high risk of gas explosions and affecting any casualties within and outside the premises**. The gas sensors help detect the concentration of the gases present in the atmosphere to avoid hazardous consequences like fire breakouts.

DISADVANTAGE

**Poor stability and greater environmental impact**; in particular, the selectivity of each sensor is not \* and the output parameters cannot be determined. Therefore, it should not be used in places where accurate measurement is required.

11.CONCLUSION

Hence, the leakage of the gas causes destructible impact to the lives and as well as to the heritage of the people. So, the system consists of Alarm unit which is Buzzer gives an audible sign of the presence of LPG volume. The sensors are widely used to detect essence of propane, iso-butane, LPG and even smoke. If the LPG sensor senses gas leak from workplace or home, sensor output goes to active low (logic 0) condition. The Arduino UNO turns on the LCD and buzzer. It even turns on the GSM modem after that, it continues to send messages SMS to mobile number specifically mentioned in the program of the source code for alerting danger to the people and the LPG safety device is used to turn off the gas supply by using this system we can reduce gas leakage accidents. Indanger situations we are able to save the life by using this system.

12.FUTURE SCOPE

The Future scope of the project is adding more software based intelligent functions with this system. This is an automatic gas detection, control and alert system. In future thissystem will have a feature where it can notify the emergency services if any accidents happen. A mobile app and webbased app for real time monitoring also will be added. In the user app for this system many smart features will be added. The overall features will make the system safer for the users. The system will be optimized for use in many places like the car, the home, industries and many other places. After designing the final prototype with multifunctional.

13. APPENDIX

| **S.N.** | **COMPONENTS NAME** | **DESCRIPTION** | **QUANTITY** |  |
| --- | --- | --- | --- | --- |
| 1 | Arduino Board | Arduino UNO R3 Development Board | 1 | <https://amzn.to/3bjpPDS> |
| 2 | GSM Module | SIM800/900 UART GSM Module | 1 | <https://amzn.to/3cqDL06> |
|  |  |  |  |  |
| 3 | LCD Display | JHD162A 16x2 LCD Display | 1 | <https://amzn.to/2YVEF0W> |
| 4 | Potentiometer | 10K | 1 | <https://amzn.to/35Qrn7f> |
|  |  |  |  |  |
| 5 | Gas Sensor | MQ-135/MQ7/MQ6/MQ5/MQ2 | 1 | <https://amzn.to/2WLIPFL> |
|  |  |  |  |  |
| 6 | Arduino Power Supply | 5V DC Adapter | 1 | <https://amzn.to/3cnwUEI> |
|  |  |  |  |  |
| 7 | GSM Power Supply | 12V DC Adapter | 1 | <https://amzn.to/2yNfItP> |
| 8 | Connecting Wires | Jumper Wires | 20 | <https://amzn.to/2L8Xc1p> |

SOURCE CODE:

import time

import sys

import ibmiotf.device

import random

#Provide your IBM Watson Device Credentials

organization ="z2nb9k"

deviceType = "raspberypi"

deviceId = "123"

authMethod = "token"

authToken = "1234567890"

# Initialize GPIO

def myCommandCallback(cmd):

print("Command received: %s" % cmd.data['command'])

status=cmd.data['command']

if status=="Lighton":

print ("Light is on")

elif (status == "LIghtoff") :

print ("Light is off")

elif status == "sprinkleron":

print("Sprinkle is OFF")

elif status == "sprinkleron":

print("Sprinkle is ON")

#print(cmd)

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 device: %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(0,100)

Humid=random.randint(0,100)

gas=random.randint(0,100)

data = { 'temp' : temp, 'Humid': Humid, 'gas' : gas }

#print data

def myOnPublishCallback():

print ("Published Temperature = %s C" % temp, "Humidity = %s %%" % Humid, "Gas\_Level = %s %%" %gas, "to IBM Watson")

success = deviceCli.publishEvent("IoTSensor", "json", data, qos=0, on\_publish=myOnPublishCallback)

if not success:

print("Not connected to IoTF")

time.sleep(1)

deviceCli.commandCallback = myCommandCallback

# Disconnect the device and application from the cloud

deviceCli.disconnect()

GITHUB LINK:

https://github.com/IBM-EPBL/IBM-Project-44663-1660726004

https://drive.google.com/file/d/1XaufLt8OdQ3vA\_Y3W84XHt1tUyNrWMRa/view?usp=drivesdk