GAS LEAKAGE MONITORING AND ALERTING SYSTEM

TEAM ID:PNT2022TMID44431

OUR PROJECT GUDIES:

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1.INTRODUCTION

- IOT has changed the living of human beings. It‟s a hot topic in the industry but not a fresh idea. It‟s a concept of network devices that can sense and gather data throughout the world around us with the help of sensors.

- Then share that data across the Internet where it can be processed and utilized for many interesting purposes.IBM, Siemens, and Microsoft etc. are working in this field.

- Smart kitchen quarter of the household appliance market grasp vast prospective, because the use of devices in the kitchen is more than any other area of the home that‟s why kitchen has enormous such devices which facilitate the work in kitchen

- Also, a lot of people want to spend fewer times in cooking and also want their food to be quickly prepared, which is why people choose to purchase all those devices that help them in cooking and many other tasks in the kitchen.

- Smart kitchens reduce the expenditure, enhance the energy effectiveness, and guarantee the protection and health checking.
- Gas leakage is a serious problem and nowadays it is observed in many places like residences, industries, and vehicles like Compressed Natural Gas (CNG), buses, cars, etc.
- The reason for such explosions is due to substandard cylinders, old valves, no regular checking of gas cylinders, worn out regulators and a lack of awareness of handling gas cylinders.
- Therefore, the gas leakage should be detected and controlled to protect people from danger. An odorant such as ethane thiol is added to LPG, so that leaks can be detected easily people.
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1.1PROJECT OVERVIEW

- People go in the kitchen for cooking on a regular basis. Natural gas is a kind of energy resource that is generally used in homes for cooking, and heating.

- But this energy resource can become hazardous if ever leakage happens in the gas cylinder. Several disasters took place due to gas leakage that consequence in monetary victims as mortal injuries.
- Our plan is to diminish the hazards in Kitchen using the Internet of Things. In this paper, we have given the solution to the problem stated. For this, we illustrated the design and implementation of SMS based gas leakage or fire detection and alert system.

- The work aim of scheming such system is to identify leakage of gas and then aware the person about this.

- The subscriber by means of alerts and status accumulated in the database and demonstrated on mobile screen in the form of SMS using GSM module, if the leakages of gas or fire happened.

1.2Purpose

- The gas detectors can be used for the detection of combustible, flammable and poisonous gases and for loss of oxygen, and also to

detected a gas leak or other pollutants.

- It makes the area where the leak occurs an warning sound and instructs operators to leave the area.
- Personal Gas Monitor - a device worn by a person that measures airborne gases and provides a warning when alarm levels of hazardous gases are reached.
- Portable Gas Monitor - is equipment used to test the condition of air prior to entering an area that could have a hazardous atmosphere.

2.LITERATURE SURVEY

S.NO	TITLE	OBJECTIVE	ADVANTAGE	DISADVANTAGE	FUTURE SCOPE
1	IOT BASED HOME SAFETY GAS LEAKAGE DETECTION AND AUTOMATIC BOOKING SYSTEM	Gas spillages causes a significant issue in family unit, It will be difficult situation for the individual who uses LPG gas for cooking reliably.	Our system helps customers to upgrade their safety and protect life and property from reputed accidents. We can able to observe the amount of the gas and also the gasleak	It requires air or oxygen to work. It can be poisoned by lead, chlorine and silicon. It is difficult to know failure modes unless very advanced methods of monitoring are used.	Futurescope of LPG/CNG gas leakage detection system this monitoring system can be further enhanced by using blutooth in place of GSM to send alert messages to the user, which supports anotherreal-time application
2	Sensor-Based Gas Leakage Detector System	Liquefied Petroleum Gas (LPG) is a main source of fuel, especially in urban areas because it is	It measures toxic gases in very low concentrations. It has ability to detect wide range	All the gases do not have infrared absorption. Sequential monitoring is slower	A robot has been utilized in trading human for taking care of different errands in a risky and perilous working

		clean compared to firewood and charcoal.	of gases.	on multi-point analyzers.	environment where human life may in danger.
3	LPG GAS LEAKAGE DETECTION USING IOT	This paper provides a brand new approach to discover LPG discharge supported microcontroller based Arduino.	It uses physical technique only for sensing. There are no unseen failure modes	All the gases do not have infrared absorption. Sequential monitoring is slower on multi-point analyzers.	Voice feedback system can be included in GSM based LPG weight and LPG leakage detection system.
4	SMS Based Gas Leakage and Fire Detection Alert System to attempt as Firewall against Cybersecurity	Safety is the foremost aspect in today‟s world. In this world of technology, people need technology to help them in danger conditions.	It can be used for wireless applications. It can be placed in harsh & rotating parts.	Non-linear response affects sensor complexity. It is difficult to handle while fabrication due to smaller size.	In future, some other wireless technology can be used to sense gasses and can be helpful for control of gas leakage.
5	IoT Application for Gas Leakages Monitoring	IoT Application for Gas Leakages Monitoring	Supervise gas concentration levels Get real-time alerts about the Gaseous presence in the atmosphere.	Depending upon what impact protection has been provided, the moving parts on floats can be easily damaged. Will also detect water or any liquid	A portable gas detecting robot can be built to detect the spillage of gas through pipelines as the robot can proceed onward a track which is arranged along the length of pipeline

2.1 Existing problem :

- Natural gas leaking can lead to breathing problems and nausea. There is a higher risk of these in the wintertime when the heater tends to be on for long periods of time and no ventilation or air can escape. While the gas is lingering around in your home, you are inhaling toxins making it a dangerous and deadly environment to be in. If you feel your health deteriorating or get mild symptoms

only while at home, this can be a strong indicator that your home has a gas leakage.

- Some of the mild symptoms that occur can be as common as a headache. A continuous migraine and drowsy feeling are clear indicators of a gas leak. You might not think to associate these with something like a gas leak but often times there is a distinctive smell that contributes to a sickly feeling.
- A gas leak refers to a leak of natural gas or another gaseous product from a pipeline or other containment into any area where the gas should not be present. Gas leaks can be hazardous to health as well as the environment.

2.2 Reference :

[1] M. Du, Z. Chen, C. Liu, R. Oak, and D. Song, "Lifelong anomaly detection through unlearning," in Proceedings of the 2019 ACM SIGSAC Conference on Computer and Communications Security, 2019, pp. 1283-1297.

[2] H. Jain, R. Oak, and J. Bansal, "Towards Developing a Secure and Robust Solution for E-Voting using Blockchain," in 2019 International Conference on Nascent Technologies in Engineering (ICNTE), 2019: IEEE, pp. 1-6.

[3] K. S. Jhala, R. Oak, and M. Khare, "Smart collaboration mechanism using blockchain technology," in 2018 5th IEEE International Conference on Cyber Security and Cloud Computing (CSCloud)/2018 4th IEEE International Conference on Edge Computing and Scalable Cloud (EdgeCom), 2018: IEEE, pp. 117-121.

[4] M. Khare and R. Oak, "Real-Time distributed denial-of-service

(DDoS) attack detection using decision trees for server performance maintenance," in Performance Management of Integrated Systems and its Applications in Software Engineering: Springer, 2020, pp. 1-9.

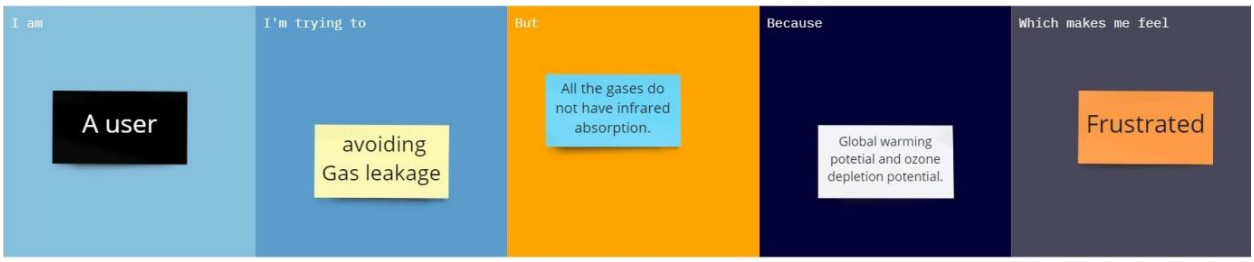
[5] R. Oak, "Extractive techniques for automatic document summarization: a survey," International Journal of Innovative Research in Computer and Communication Engineering, vol. 4, no. 3, pp. 4158-4164, 2016.

[6] R. Oak, M. Du, D. Yan, H. Takawale, and I. Amit, "Malware detection on highly imbalanced data through sequence modeling," in Proceedings of the 12th ACM Workshop on artificial intelligence and security, 2019, pp. 37-48.

2.3 Problem Statement Definition :

- Gas leakage leads to various accidents resulting into both financial loss as well as human injuries. In human is daily life, environment gives the most significant impact to their health issues.
- The risk of fires, explosion, suffocation, all are based on their physical properties such flammability, toxicity etc.
- The number of deaths due to the explosion of gas cylinders has been increasing in recent years. the reason for such explosion is due to sub- standard cylinders, old valves worn out regulators and lack of awareness using gas cylinders add to risks. Inspections by oil companies found that many LPG consumers are unaware of safety checks of gas cylinders.
- In other to minimize or eliminate the hazard off gas leakage there is a need for a system to detect and alert on such incidence leading to the development of this project.

Problem Statement:



Problem Statement (PS)	Iam (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	User	Avoiding gas leakage	All the gases do not have infrared absorption	Global warming potential and ozone depplestion potential.	Headaches
PS-2	User	Avoiding gas leakage	Another potential danger of agas leak is carbon monoxide poisoning.	The gas leaks can cause fire and explosion.	Sickness
PS-3	User	Avoiding gas leakage	The gas is heavier than air,so it getes collected at the lowest spot in the case of leakage it causes suffocation.	Since, it is odourless and dissipates into the air easily.	Weakness
PS-4	User	Avoiding gas leakage	Its more hazardous in case fire.	When gas comes into contact with any spark from appliances in your home.	Suffocation
PS-5	User	Avoiding gas leakage	Proper ventilation And detection system is required for indoor storage.	It can be a source of potential danger,it can cause a fire or explosion.	Nausea

3.IDEATION&PROPOSED SOLUTION:

3.1 Empathy Map Canvas

- The Empathy Map Canvas helps teams develop deep, shared understanding and empathy for other people. People use it to help them improve customer experience, to navigate organizational politics, to design better work environments, and a host of other things.

- According to he has seen a lot of versions of this tool since he created it so many years ago, and they vary widely. The Empathy Map was created with a pretty specific set of ideas and is designed as a framework to complement an exercise in developing empathy.

- While the success of the Empathy Map is exciting and makes us very happy, a lot of the thinking has gotten lost in translation over the years, and the various versions that have proliferated across the web have somewhat degraded the original concept.

- More recently, he decided to create a new version of the Empathy Mapping Canvas, applying what he learned from Alex Stallholders to make the tool more usable and to deliver better experiences and outcomes.

- An empathy map is a simple , easy –to digest visual that captures knowledge about a user’s behaviours and attitudes.

- It is a useful tool to helps teams better understand their users.

- Creating an effective solution require understanding the true problem and the person who is experiencing it. The exercise of creating the map helps participants consider things from the user's perspective along with his or her goals and challenges.

3.2 Ideation & Brainstorming:

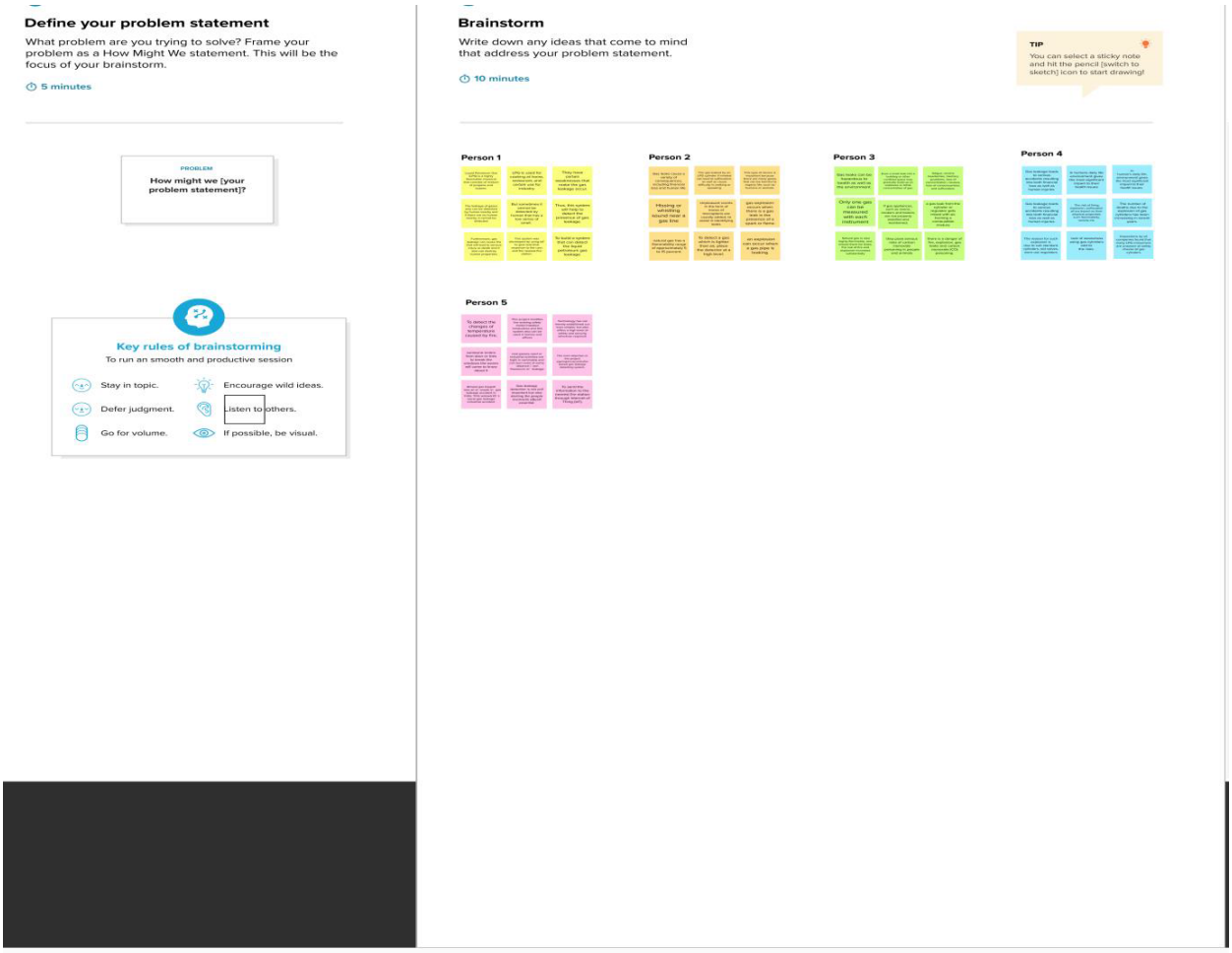
- Gas leakage detection systems are an integral part of a safety system, providing the first line of defence against the possible disasters of gas leakage.

- It detects the gas leakage and triggers an alert system to activate safety precautions. Some leakages are too small to be smelled or are of an unscented gas, so it's a necessary investment to install a

gas leakage detection system.

- There is a diverse portfolio of gas detection systems available in the market, but it is paramount to know what particular detection system fulfils the requirement.

- Things to consider during Gas detection selection are gas detection, detector location, the flow of gas, and alarm management.
- Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving.
- Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich amount of creative solutions.
- Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.



3.3 Proposed Solution:

- LPG is an exceptional fuel. The energy provided by LPG is unmatched by most of the fuels mainly due to the calorific value it carries also with the portability LPG offers as a fuel. Maybe because of this reason, LPG as a fuel can serve even the remotest of the locations. Let’s look at some basic LPG properties.

- LPG by nature is colourless and odourless. It’s a mixture of propane and butane in varying compositions.

- LPG is highly flammable in the 2% to 9% LPG Air ratio.
- LPG remains a gas at normal temperature. Therefore, in the cylinders at your home, it’s kept at a highly pressurised way to keep it in the liquid state. The liquid state is easy to handle and transport.
- One drop of liquid LPG expands 250 times when it changes to vapour LPG. So in a short time, it can fill your entire kitchen.
- Therefore, to detect and avert this danger, Ethyl Mercaptan is the chemical added to LPG. It has a pungent smell and is easily detectable by humans.
- Even though LPG is very helpful and people are generally alert, there are still chances for improvement and a safety culture needs to be inculcated in people. Please find below some safety tips to do in case of LPG Emergency.
- Do not panic Open all doors & windows for ventilation. LPG is heavier than air and hence it tends to settle down. Opening doors must be the first step
- Put off all flames, lamps, incense sticks etc.
- Put the safety cap back on the cylinder.
- Close regulator and burner knobs.
- Do not operate any electrical switches, appliance or equipment in the kitchen.
- Isolate the electrical supply from the outside source.

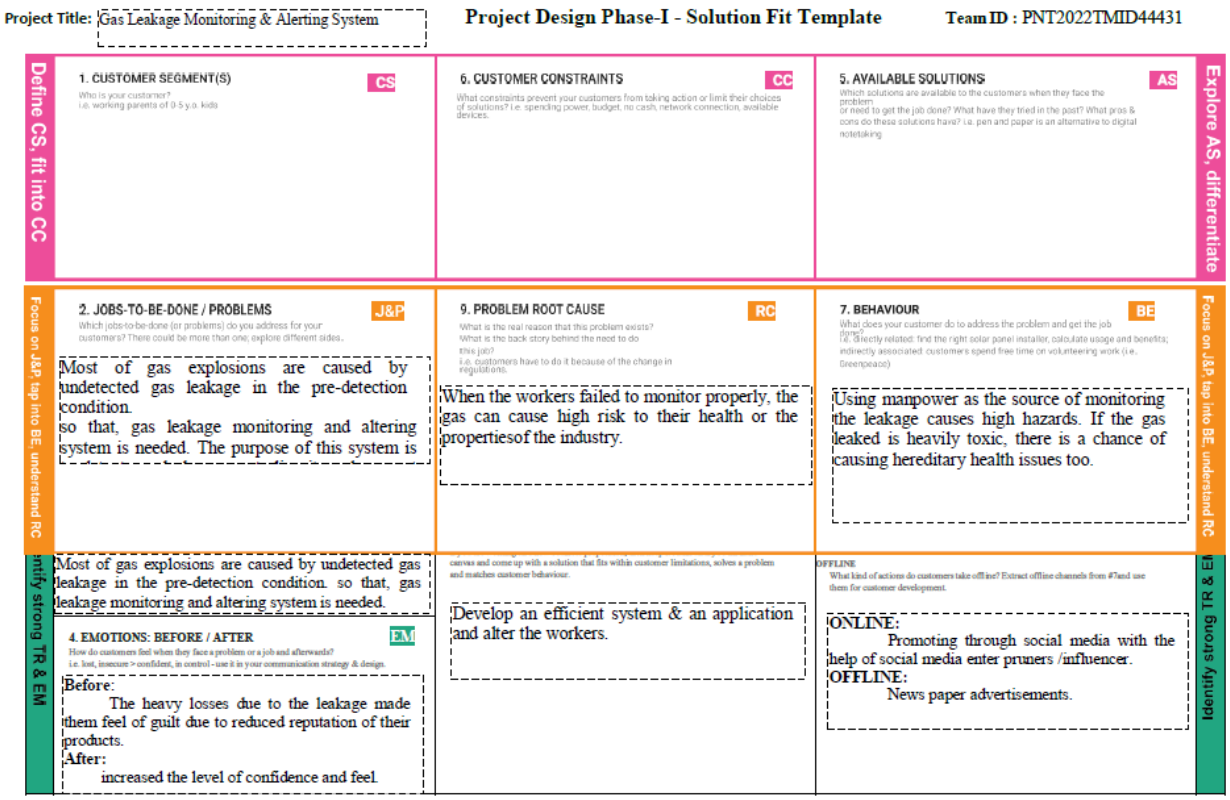
- Call your LPG dealer for emergency assistance
- Try to isolate the cylinder to an open space and cover it with wet cloth.
- Call the fire brigade and police if required.
- LPG or Liquefied Petroleum Gas is an umbrella term given for a flammable mixture of hydrocarbon gas majorly containing Propane and butane and mixtures of these.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	• 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. Furthermore, gas leakage can cause fire that will lead to serious injury or death and it also can destroy human properties.
2.	Idea / Solution description	• When the gas leakage is detected it will alert the user by alarm/buzzer . • It can send the sms to the user also We can also make the exhaust fan on while during the gas leakage. • Detection of the gas leakage is important and halting leakage is important equally.
3.	Novelty / Uniqueness	• Instant detection of gas leakage . • send sms to the concerned user • easy to access and operate .
4.	Social Impact / Customer Satisfaction	• Cost efficient .

		• Easy to access and operate . • Easy installation and detect the gas leakage fast. • Prevent fires and explosions.
5.	Scalability of the Solution	• Our end to end wireless gas monitoring system uses wireless sensors to detect the presence of toxic gases .The solution can hence be scaled up for flexible functionality and offer great extendibility for multi-purpose usage.

3.4 Problem Solution fit:

- Create a problem statement to understand your customer's point of view.
- The Customer Problem Statement template helps you focus on what matters to create experiences peoplewill love.
- Check your appliances regularly.
- A well-articulated customer problem statement allows you and your team to find the ideal solution for the challenges your customers face. Throughout the process, you'll also be able to empathize with your customers, which helps you better understand how they perceive your product or service.
- Check the signs.
- Have your gas lines monitored.
- Check your gas safety documents.
- If you detect a gas leak, turn off the gas supply.
- Open the windows and shut off your electronic devices.
- Do not smoke.
- Do not flick light switches



4. REQUIREMENT ANALYSIS:

4.1Functional requirements

- The gas detection function shall provide reliable and fast detection of flammable and toxic leaks before a gas cloud reaches a concentration and size which could cause risk to personnel and installation.
- Flammable gas detection shall be provided in all areas where flammable gas leakages could occur. In these areas the smallest gas cloud that has the potential to cause unacceptable damage shall be specified as the minimum cloud size for confirmed gas detection.
- Detectors shall be provided based on an assessment of gas leakage

scenarios within each area considering potential leakage sources and rate, dispersion, density, equipment arrangement and environmental conditions such as ventilation, and the probability of detection of small leakages within the area.

- Dispersion simulations may be performed for optimisation of the number and location of detectors.
- The basis and assumptions used for detector selection and location for each area shall be documented.
- Open path detectors are preferred where the layout enables good coverage by such detectors.
- Considerations related to detection principle shall be made to environmental effects (e.g. snow, fog, sun, rain/wind, relative motion, detector beam blocking) and necessary protection arranged when detectors are located. Open path detectors should be used in combination with point detectors when environmental condition may make the open path detectors unavailable.
- Catalytic detectors shall not be used unless proper detection performance by other types is not achieved.

FR.NO	**Functional Requirement(Epic)**	**Sub Requirement(Story/Sub Task)**
FR-1	Monitoring	Level of gas is monitoring using sensor and if there is any leakage, alert can b sent through message and with a buzzer.
FR-2	User Reception	The data like the level of gas can be send

		through message.
FR-3	User Understanding	The user can monitor the level of gas with the help of the data.iif there is an increase in gas then the alert will be given by message or buzzer sound.
FR-4	User Performance	When the user gets notified, they could take precaution steps like turning the gas off, turn on the exhaust fan/sprinkler and avoid serious accident.

4.2 Non-Functional requirements:

- Non-functional requirement In systems engineering and requirements engineering, a non-functional requirement (NFR) is a requirement that specifies criteria that can be used to judge the operation of a system, rather than specific behaviours.
- They are contrasted with functional requirements that define specific behaviour or functions.
- Non-functional requirements (also known quality requirements) are generally more difficult to express in a measurable way, making them more difficult to analyse. In particular, NFRs tend to be properties of a system as a whole, and hence cannot be verified for individual components.
- After the modifiability model has been built, the user can provide the non-functional requirements that are to be checked on the

models.

- These non-functional requirements are written in the form of quality attribute scenarios.
- The responsibilities on which the attributed scenario is to be evaluated are input to the tool.

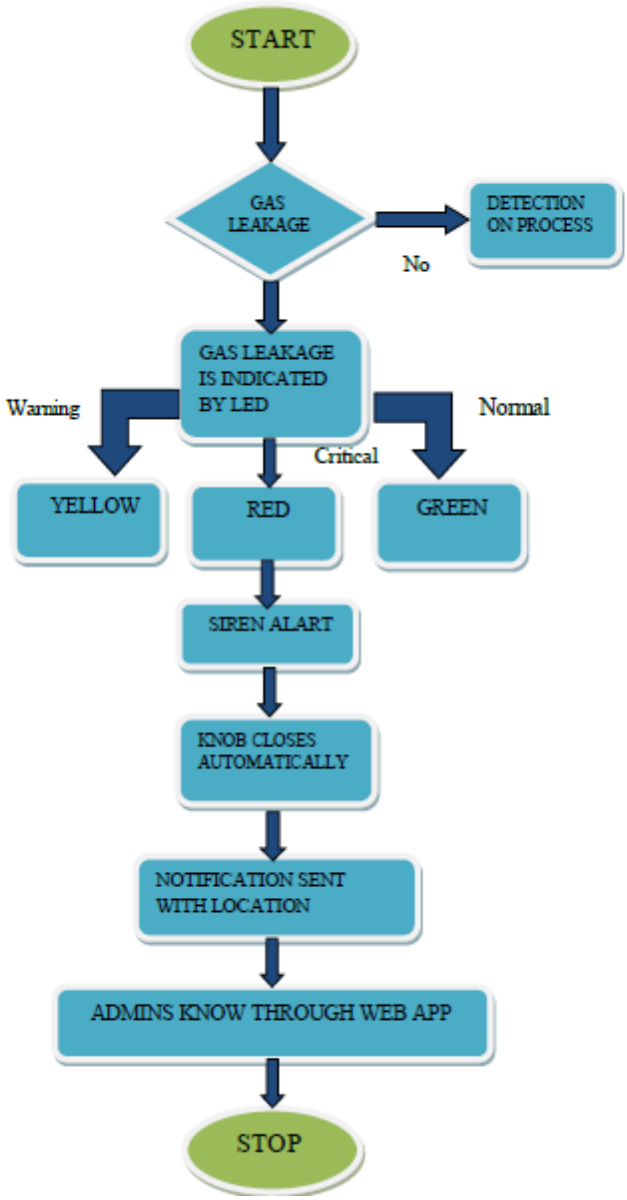
FR NO	**Non-functional Requirement**	**Description**
FR-1	Scalability	Sensors can be replaced every time it fails
FR-2	Availability	It can be used for everyday; it includes dayand nights.
FR-3	Performance	Sprinkler and exhaust fans are used in caseof emergency.
FR-4	Reliability	Can be able to provide accurate values. It might have a capacity to recognize the smoke accurately and does not give a false.
FR-5	Security	As a result of emergency alert , We can be able to protect both the humans and properties. Precaution steps could be taken.

FR-6	Usability	It updates the data regularly as well as protects the workers.

5.PROJECT DESIGN

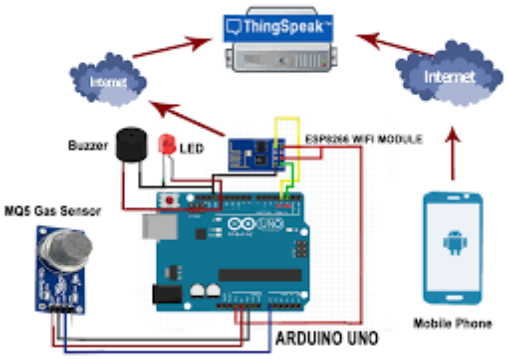
5.1Data flow diagram:

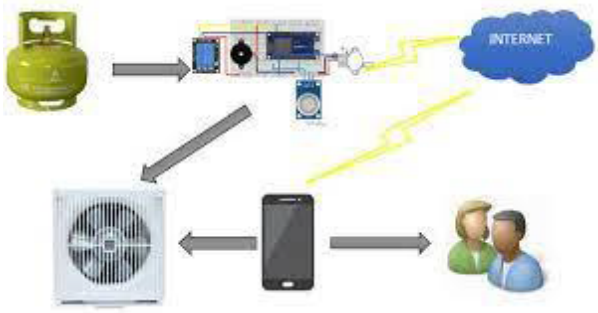
- A data flow diagram (DFD) maps out the flow of information for any process or system. It uses defined symbols like rectangles, circles and arrows, plus short text labels, to show data inputs, outputs, storage points and the routes between each destination.
- Internet of things try towards making life less complex what's more, quicker via robotizing the whole little errands related with the life of human.
- Today, everything is getting keen because of the innovative advancement, for example, of IOT. As IOT is valuable for robotizing the assignments, the upside of IOTcan likewise be far reaching for improving the helpful security strategies.
- A portable gas detecting robot can be built to detect the spillage of gas through pipelines as the robot can proceed onward a track which is arranged along the length of pipeline.



5.2 Solution &Technical Architecture

- The system can be taken as a small attempt in connecting the existing primary gas detection methods to a mobile platform integrated with IoT platforms.
- The gases are sensed in an area of 1m radius of the rover and the sensor output data’s are continuously transferred to the local server.





5.3 User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story Number	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USN-1	As a user, I can register for the application by entering my email, password, and	I can access my account / dashboard.	High	Sprint-1

			confirming my password.			
Customer (Mobile user)	Registration	USN_2	As a user, I willreceive confirmation email once I have registered for the application.	I can receive confirmation email & click confirm.	High	Sprint-1
		USN-3	As a user, I can register for the application through OTP.	I can register & access the dashboard with Face book Login.	Low	Sprint-2
		USN-4	As a user, I can register for the application through Gmail.		Medium	Sprint-1
	Login	USN-5	As a user, I can log into the application by entering Login Id & password.		High	Sprint-1

Customer (Web user)	Registration	USN-1	As a user, I can register for the application by Google.	I can access confirmation email.	High	Sprint-1
		USN-2	As a user, I can register for the application by firebox.	I can access confirmation Login.	low	Sprint-2
	Login	USN-3	As a user, I can register for the application through Gmail.	Medium	Sprint-1	Login
Administrat or	Registration	USN-1	As a user, I can register for the application through Mobile app.	I can access confirmation My account.	High	Sprint-1
		USN-2	As a user, I can register for the application through Mobile app.	I can access confirmation email.	low	Sprint-2

6.Project planning & 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	Surendar Muthupandi
Sprint-1	Features	USN-2	As a system, the gas sensor values should be displayed in a LCD screen	2	Low	Surendar Muthupandi
Sprint-1	Features	USN-3	As a system, as soon as the detected gas reachesthe threshold level, the red color LED should be turned ON.	5	High	Surendar Muthupandi
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	Surendar Muthupandi
Sprint-2	Focus	USN-5	As a system, it should the send the location where the gas is detected	8	High	Surendar Muthupandi
Sprint-2	Focus	USN-6	As a system, it should also send the alerting SMS to the registered phone number	2	Low	Surendar Muthupandi

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
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	Surendar Muthupandi
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	Surendar Muthupandi
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	Surendar Muthupandi
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	Surendar Muthupandi
Sprint-3	Data Transfer	USN -11	As a cloud system, the IBM cloud should send the data to NodeRed	2	Medium	Surendar Muthupandi
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	Surendar Muthupandi
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	Surendar Muthupandi
Sprint-4	Registration	USN -14	As a user, I must first register my email andmobile number in the website	2	High	Surendar Muthupandi

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	Surendar Muthupandi
Sprint-4	Login	USN-16	As a user, I can login into the web application through email and password.	3	High	Surendar Muthupandi
Sprint-4	Dashboard	USN-17	As a user, I can access the dashboard andmake use of available resources.	2	Medium	Surendar Muthupandi
Sprint-4	Focus	USN-18	As a user, I must receive an SMS once the leakage is detected.	5	High	Surendar Muthupandi
Sprint-4	Allocation	USN-	As an admin, I must receive information about theleakage along with 19location and share exact location and route to the person.	3	High	Surendar Muthupandi
Sprint-4	Allocation	USN-20	As an admin, I must allot particular person to look after the leakage in a particular location.	3	High	Surendar Muthupandi

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

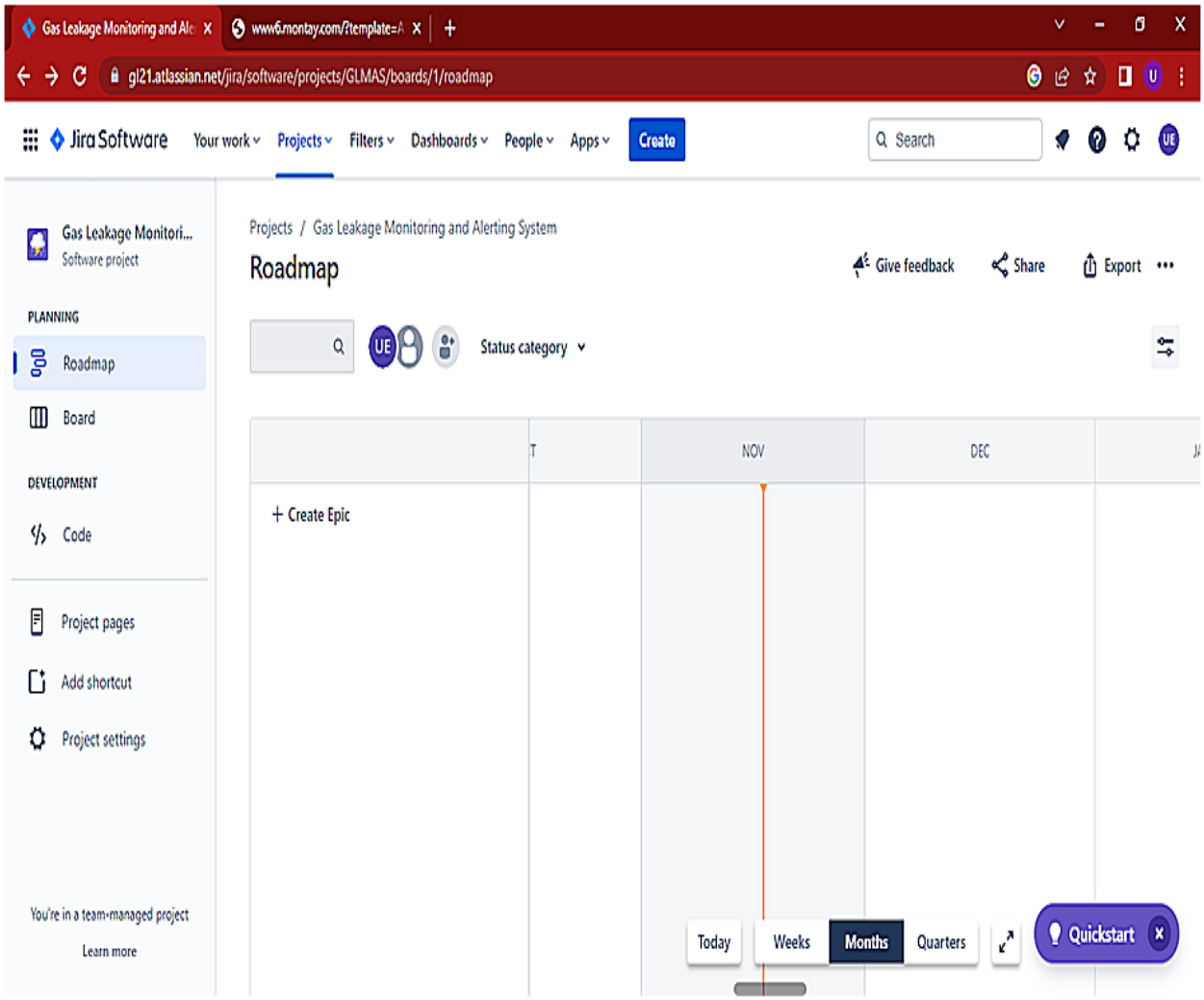
Sprint	Total Story Points	Duration	Sprint End Date(Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date(Actual
Sprint-1	20	6 Days	24 Oct 2022	17Nov2022	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	17Nov2022	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	17Nov2022	12Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	17Nov2022	19Nov 2022

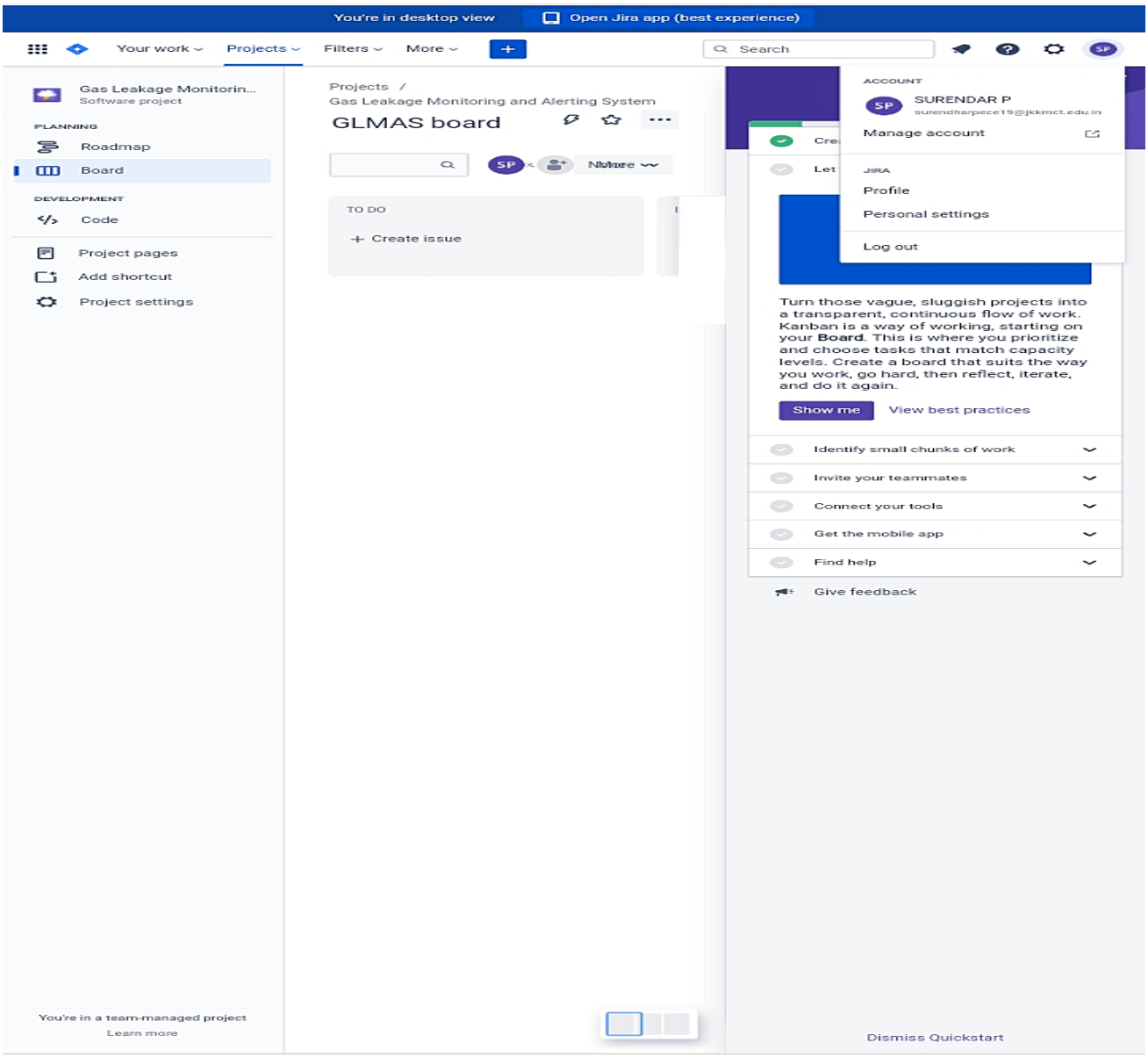
Velocity:

AV= Sprint Duration/Velocity=20

Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

6.3 Report from JIRA




You're in desktop view
Open Jira app (best experience)
Your work
Projects
Filters
More
Search
Gas Leakage Monitorin...
Software project
PLANNING
Roadmap
Board
DEVELOPMENT
Code
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Gas Leakage Monitoring and Alerting System
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7.CODING

```
#include <LiquidCrystal.h>
LiquidCrystal lcd(5,6,8,9,10,11);

int redled=3;
int greenled=2;
int buzzer=4;
int sensor= A0;
int sensorThresh=400;
void setup()
{
pinMode(redled,OUTPUT);
pinMode(greenled,OUTPUT);
pinMode(buzzer,OUTPUT);
pinMode(sensor,INPUT);
Serial.begin(9600);
lcd.begin(16,2);
}
void loop()
{
int analogValue= analogRead(sensor);
Serial.print(analogValue);
if(analogValue>sensorThresh)
,
```

```
digitalWrite(redled,HIGH);
digitalWrite(greenled,LOW);
tone(buzzer,1000,10000);
lcd.clear();
lcd.setCursor(0,1);
lcd.print("ALERT");
delay(1000);
lcd.clear();
lcd.setCursor(0,1);
lcd.print("EVACUATE");
delay(1000);
```

```
pinMode(greenled,OUTPUT);
pinMode(buzzer,OUTPUT);
pinMode(sensor,INPUT);
Serial.begin(9600);
lcd.begin(16,2);
}
void loop()
{
int analogValue= analogRead(sensor);
Serial.print(analogValue);
if(analogValue>sensorThresh)
```

8.RESULT

- The proposed system is developed to detect and monitor the LPG when a small amount of LPG is brought near the MQ6 sensor, it display the message in LCD.”Gas LEAKAGE” at the time of leakage of the gas and the system monitors the LPG level and displays the message “HIGH or LOW”.
- Internet of Things has gained its wide popularity in recent

days due to its various streams of applications which has paved way for smooth, safe and easier mode of living style for human beings.

- The main intention of this work is to ensure safe and easier way of gas booking and gas leakage detection to avoid disasters that may occur due to negligence.

9.FUTURE SCOPE

- Voice feedback system can be included in GSM based LPG weight and LPG leakage detection system. User will get intimation through pre-recorded voice messages like the weight of gas Cylinder is ABC kg.
- In future, some other wireless technology can be used to sense gasses and can be helpful for control of gas leakage.
- A robot has been utilized in trading human for taking care of different errands in a risky and perilous working environment where human life may in danger.
- A portable gas detecting robot can be built to detect the spillage of gas through pipelines as the robot can proceed onward a track which is arranged along the length of pipeline.

10.CONCLUSION

- Smart kitchen by means of IOT was aimed, created and successfully verified in this paper. Through simulation, we appraised the performance of system.

- This project is simulated using bluemix software. The outcome of the test demonstrates the ability of system to check the leakage of gas in the kitchen and send SMS alert to user‟s phone when the concentration of gas is above or below the set limit.
- Smart kitchen offers all the protection automation factors. The more work is coming in this domain. One more thing to add in these systems is battery power supply and to add many other methods for these systems to be more protective.