A

Technical Report

on

GAS LEAKAGE DETECTOR USING GSM

Submitted to CMR Institute of Technology in the partial fulfillment of the requirement of

Social Innovation Lab

Of

II B.Tech II- Semester

in

CSE DEPARTMENT

Submitted by

A. Mahesh	**(20R01A05J6)**
B.Raghu	**(20R01A05K2)**
CNS. Sree Lakshmi	**(20R01A05K6)**
D. Nisha	**(20R01A05K7)**
D. Yaswanth	**(20R01A05K8)**
G. Harshitha	**(20R01A05K9)**

Under the esteemed guidance of

Mr. P. Satyanarayana Reddy
Assistant Professor

CMR INSTITUTE OF TECHNOLOGY
(UGC-AUTONOMOUS)

(Approved by AICTE, Permanently Affiliated to JNTU Hyderabad, Accredited by NBA, Accredited by NAAC with A Grade)
Kandlakoya (V), Medchal Road, Hyderabad 501 401

2021-2022

Department of CSE

Certificate

This is to certify that the technical report entitled "***GAS LEAKAGE DETECTOR USING GSM***" is the bonafidework done and submitted by

A.Mahesh	**(20R01A05J6)**
B.Raghu	**(20R01A05K2)**
CNS. Sree Lakshmi	**(20R01A05K6)**
D. Nisha	**(20R01A05K7)**
D. Yaswanth	**(20R01A05K8)**
G. Harshitha	**(20R01A05K9)**

towards the partial fulfillment of the requirement of Social Innovation (SIL) Laboratory of **II B. Tech II-Semester** in **CSE** is a record of bonafide work carried out by them during the period **January 2022 to July 2022.**

Guide	**Co- Ordinator**	**Head of Department**
Mr. P. Satyanarayana Reddy	***Mr. U. Veeresh***	***Prof. A. Prakash***

INDEX

INTRODUCTION

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.

OBJECTIVE

- To build a system that can detect the liquid petroleum gas leakage.
- To detect the changes of temperature caused by fire.
- To send the information to the person registered through Arduino.

Gas leakage leads to various accidents resulting into both financial loss as well as human injuries.

EMPATHIZE

Empathy is the first step in design thinking because it is a skill that allows us to understand and share the same feelings that others feel. Through empathy, we are able to put ourselves in other people's shoes and connect with how they might be feeling about their problem, circumstance, or situation. Some questions to consider:

- What is the person feeling?
- What actions or words indicate this feeling?
- Can you identify their feelings through words?
- What words would *you* use to describe their feelings?

These are just some of the guided questions that students can reflect on to identify the problem and how others are feeling about it.

According to our problem statement,we empathized on the following.

>>> How can we reduce gas leakage ?

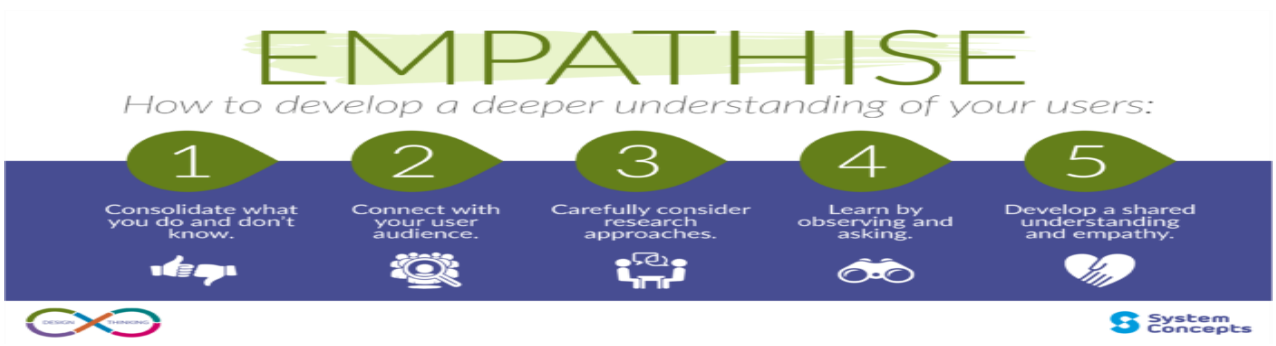
>>> Is there any way to stop in the midst of causing an accident ?

>>> How can LPG gas effect human health ?

>>> How can that cause influence on surroundings i.e., pollution ?

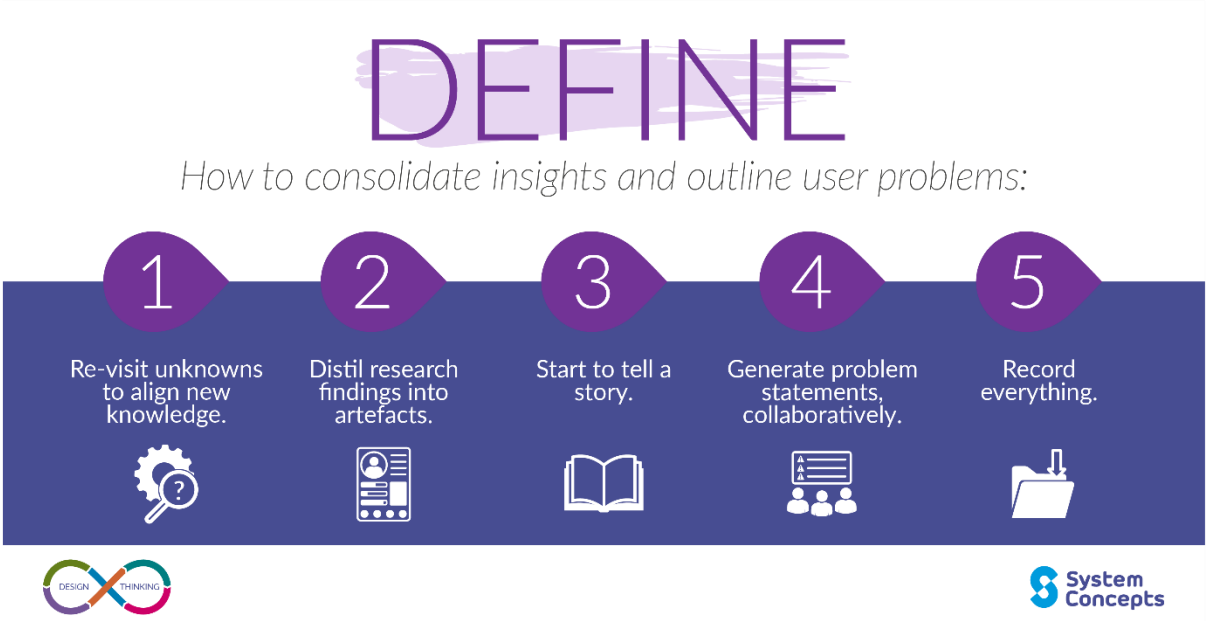
>>> Whether it will be helpful if the gas leakage is detected ?

>>> Can you suggest ways to detect the leakage of gas ?



DEFINE

The next step is to define the above feelings and identify the main problem to be solved. It's important that, throughout this process, students use language that is identifiable, positive, meaningful, and actionable. Instead of focusing on the negative side of the problem and the lack of options, steer students to using language that is positive, empathetic, and will direct them toward solution-based thinking. Defining the problem is part of the process of shaping a point of view -- our own and others' -- about the problem. Therefore, the framing should inspire the group, the student, or the entire class to find solutions.



The main problem statement is found that the main cause of accident regarding gas leakage is not knowing about that i.e., the gas leakage is going on.

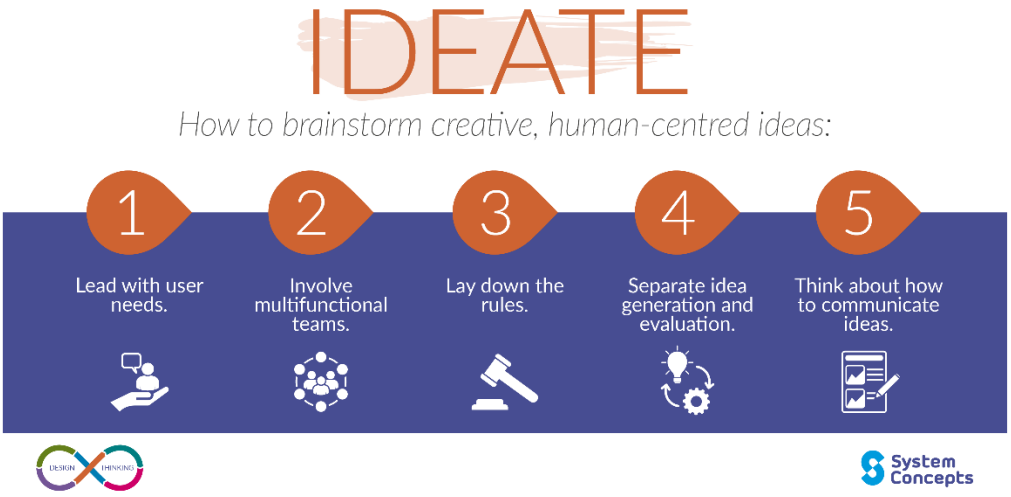
If the gas leakage is detected there will be less chances of accidents, loss and more chances of protection.

IDEATE

This process is where ideas are generated. Students can learn empathy here when you teach them new and different ways to find solutions to a problem -- there is no single right way for a great idea. Here are a few strategies that you can encourage:

- Mindmapping
- Brainstorming
- Sketchnotes
- Bodystorming
- Inquiry

This process helps students to see things from different perspectives. It allows them to step outside of what they might think is the obvious solution and instead generate ideas outside of their own realm.



According to our problem statement,

Our solution for this problem is to construct a detector which detects the gas leakage and the message will be sent to a person which may reduce the chances of accident.

Gas Leakage Detector is embedded wilth LCD display, LED and Buzzer in it.

It works through power supply. The gas sensor in the system detects the gas and that is shown on the LCD display and the LED blinks with the sound of the buzzer.The message will be sent warning a danger i.e., the gas leakage.

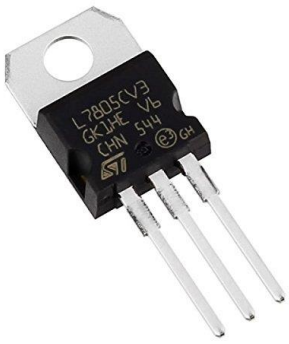
PROTOTYPE

In the prototyping phase, students get to make and create the solution to the problem. Empathy helps them see that they're in the first step in a longer process. A prototype can be changed, altered, re-evaluated, and recreated many times based on the needs of the users (either the students themselves or someone else). This process also helps students to recognize that failing is part of learning, and that it's OK to fail. Failure, however, needs to be analyzed so that we learn and grow from our mistakes. Ask these questions:

- Why did we fail?
- What worked?
- What didn't work?
- How can we improve to help the user next time?
- Is this solution feasible? Is it manageable?
- Are these changes designed with the user in mind?

COMPONENTS OF THE PROTOTYPE :

ADAPTER (12V, 1A)

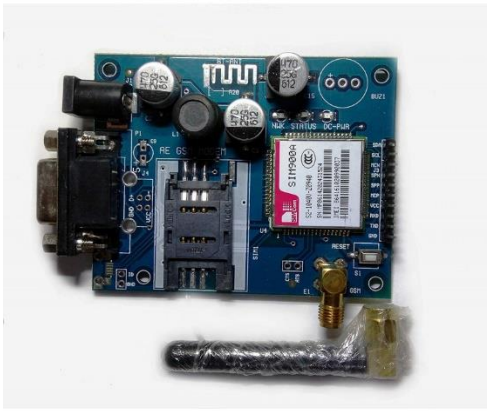


7805 REGULATOR

ARDUINO BASEBOARD

ARDUINO UNO TYPE CONTROLLER BOARD

LCD DISPLAY (2x16)



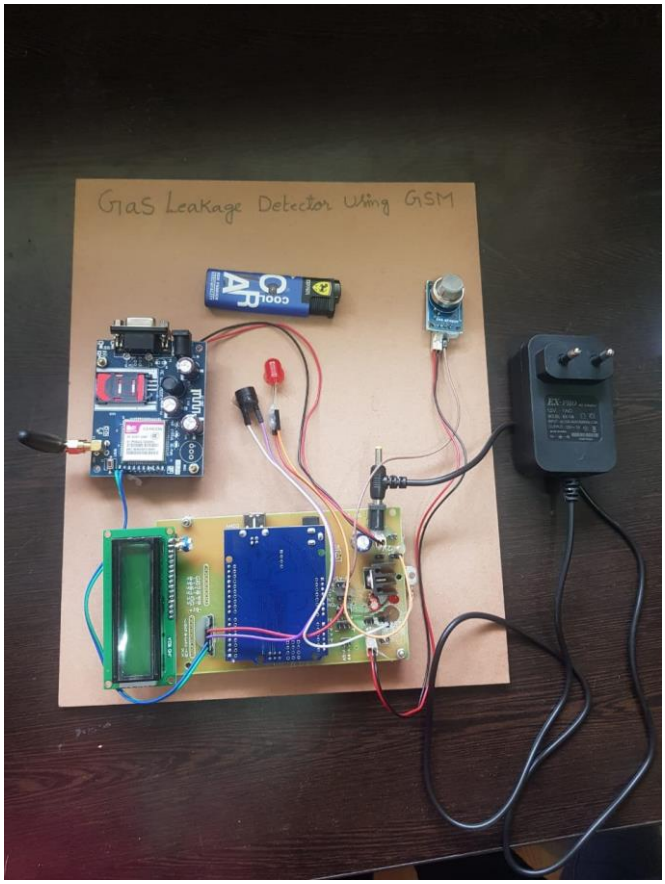
SIM 900A GSM MODULE

MQ-4 GAS SENSOR

LED

BUZZER

LIGHTER



GAS LEAKAGE DETECTOR USING GSM

(PROTOTYPE)

TEST

During testing, empathy plays a key role in shaping of the user's experience. Focus on showing and not telling. This helps the users to create their own experiences, and also helps us to identify how to improve their experiences next time. The opportunity for empathizing is important at this stage, because one is able to see the user's experience and hear his or her thoughts, feelings, and ideas. Testing also helps to shape our point of view in relation to the user's point of view.

We have given our prototype for the test users.

In some cases, our prototype was successful at times like

1. Power supply was good
2. The power divided evenly that all components could work properly.
3. LED and Buzzer functioned according to our scenerio.
4. The message was sent warning there is a danger to the registered mobile number.
5. When the signal of the registered was good i.e., when the antenna in the GSM module worked properly.

In some cases, our prototype failed working at times like

1. When there was no power supply.
2. When there was no availability of SIM to register a amobile number.
3. When the antenna in the GSM module could not catch signal.
4. Buzzer did not work properly due to power shortage.
5. LED did not blink due to the shortage of power.

REFERENCES

https://eportfolio.utm.my/artefact/artefact.php?view=35008&artefact=375387#:~:text=PROBLEM%20STATEMENT&text=The%20leakage%20of%20gases%20only,the%20presence%20of%20gas%20leakage.

https://www.edutopia.org/blog/teaching-empathy-through-design-thinking-rusul-alrubail#:~:text=1.-,Empathize,problem%2C%20circumstance%2C%20or%20situation.