TABLE OF CONTENTS

ABSTRACT

Safety is significant in this day and age and it is vital that acceptable wellbeing framework be executed in spots of Industrial structures. This system is used in Industrial building and home dwellings for the fire detection and prevention purpose. And it should be implemented in all the establishments where the risk of fire accidents is very high. The sensor nodes are placed in important areas of the building, which we create a network and the monitored data is transmitted to control unit through wireless sensor network and if the temperature or pressure reach above the threshold value and building damage is detected automatically, alerts the surroundings and take necessary precautions to prevent the disaster. This, safety system that can be used in any Constructing and constructed environments. The sensor nodes detects the maximum level that it can withhold, in the mean time it calculates where the damage is occurring and give alert to fire stationand control room.

CHAPTER 1

INTODUCTION

1.1 PROJECT OVERVIEW

Since the fire causes serious damages, fire detection has been an important study to protect human life and surroundings. If fire happens in these Industrial buildings then there will be a bad social impact, major property damage and heavy casualties will be easily caused. So fire should get detected early for can hardly detect fire characteristic parameters like temperature, vapour and flame in the early time. First step to prevent the serious damages from fire is to detect the event properly. Various methods are there to detect fire which uses different properties of fire. An- other difficulty is to properly identify the characteristics of fire. The fires properties like colour, shape, temporal energy, spatial characteristics are identified in different methods. The traditional methods use sensors to detect the fire which cannot be used for early detection. So video based or computer vision based methods are more appropriate for analysis. The fire properties can be identified effectively while analyzing videos. One of the most common problems found in the area of video technology for fire detection is that early identification of fire and its properties. The main causes of fire may be burning things, wildfire, and accidents so on. To detect these fires an efficient methodology is needed as early fire detection system.

1.2 PURPOSE

The primary purpose of fire alarm system is to provide an early warning of fire so that people can be evacuated & immediate action can be taken to stop or eliminate of the fire effect as soon as possible. Alarm can be triggered by using detectors or by manual call point (Remotely). To alert/evacuate the occupants siren are used. With the Industry-specific intelligent fire management system, the suggested technique in Fire alarm system used the addressable detectors units besides using the wireless connection between the detector in zones as a slave units and the main control unit as the master unit. The system shall include a control panel, alarm initiating devices, notification appliances, and the accessory equipment necessary for a complete functioning fire alarm system. In the wireless fire alarm, individual units are powered by primary & secondary batteries for the communication.

CHAPTER 2

LITERATURE SURVEY

2.1 EXISTING PROBLEM

The fire alarm working principle is based on thermistor used in the fire alarm circuit. This fire alarm circuit is used to identify and indicate an increase in temperature beyond certain value (temperature of an enclosed area). All Fire Alarm Systems essentially operate on the same principle. If a detector detects smoke or heat, or someone operates a break glass unit, then alarm sounders operate to warn others in the building that there may be a fire and to evacuate. A thermistor is an inexpensive and easily obtainable temperature sensitive resistor, thermistor working principle is it's resistance depends upon the temperature. When temperature changes, the resistance of the thermistor changes in a predictable way. The benefits of using a thermistor is accuracy and stability.

2.2 RFERENCES

Paper1:

TITLE: Fire detection and alarm system

Publication year:2019 Author name:Trung Luong

Journal name:HAMK Journal of Electrical and Automation Engineering

Summary:

The central target of this project was to study, analyse and design a fire detection and alarm system. This topic was suitable because it covered a basic and important aspect in our modern life. The objectives of the project were to provide information on fire alarm system in Vietnam and Finland, to show the similarities and differences with systems in both countries. For practical part, Arduino Uno was used as the control unit with other necessary components.

Upon completing this project, the author has demonstrated how a fire detection and alarm system works and analysed the system standards in the above- mentioned countries. Moreover, the fire alarm system using the Aurdino Uno was tested and found to work successfully.

Methodology: The project consist of smoke sensor, flame sensor, LED and Buzzer, Ardunio Uno as its primary components. The fire can be detected by theflame sensor and the smoke sensor also detect fires by sensing small particals the air.

Paper 2:

Summary:

Fire identifiers are utilized to recognize the fire or smoke at a beginning time and can help in sparing lives. Right now, IOT based alarm has been planned utilizing temperature and smoke sensor. By utilizing the temperature sensor, smoke sensor and there is a simple to advanced convertor, which changes over the simple signs got at the sensor end to computerized and afterward transmits them to a smaller scale controller and to the Arduino. The small-scale controller is modified to turn on the ringer, when the temperature and the smoke arrive at an edge esteem. Simultaneously, Arduino sends the information to the Wi- Fimodule ESP8266. ESP8266 will then the accompanying information to the

IOT site, where, approved individuals can take fitting measure so as to check the fire. The gadget id is the one-of-a-kind id given to a gadget, which would enable the work force to get data identified with the area, where the fire is detected.

Methodology: Iot must be self-contained for searchoperation, decision making based on the real-time data or current condition (object detection), intelligent decision (software program) for the immediate surrounding environment or condition is to perform the task or mission

Paper3:

Title: Developed Intelligent Fire alarm system

Publication year: 2012

Summary:

Alarm can be triggered by using detectors or by manual call point (Remotely). To alert/evacuate the occupants siren are used. With the Intelligent Building of the rapid development of technology applications, commercial fire alarm market demand growth, the key is to use the bus system intelligent distributed computer system fire alarm system, although installation in the system much easier than in the past , but still cannot meet the modern needs, the installation costs of equipment costs about 33% ~ 70. The suggested technique in Fire alarm system used the addressable detectors units besides using the wireless connection between the

detector in zones as a slave units and the main control unit as the master unit. The system shall include a control panel, alarm initiating devices, notification appliances, and the accessory equipment necessary for a complete functioning fire alarm system.

Methodology: The project consist of smoke sensor, flamesensor, Ardunio Uno as its primary components. To the design of high reliability, strong anti- interference ability of automatic fire alarm system.

Paper4:

Title: Recent Advances in Fire Detection and Monitoring Systems

Publication year: 2020

Author name: RAFIK GHALI, MARWA JMAL, WIDED MSEDDI

Summary:

Wildfires are one of the most impacting natural disasters, leading to a huge devastation of humans and the environment. Due to the rapid development of sensors and technologies as well as the success of computer vision algorithms new and complete solutions for automatic fire monitoring and detection have been exposed. However, in the past years, only few literature reviews have been proposed to cover researches until the year 2015. To fill this gap, an up-to- date comprehensive review on this problem. we expose vision- based methods for fire detection. Our main focus was on techniques based on deep convolutional neural networks (CNNs). Methodology: Traditional ground systems, also called terrestrial systems, are based on human supervision. Fire detection and monitoring is performed by supervising regions locally or by analyzing data provided from local sensors such as flame, smoke and heat detectors, and gas sensors. In order to increase systems efficiency and detect the exact location of fires, ambient sensors were also integrated. These sensors are used during the day and night to detect fire and smoke and identify their characteristics. The main sensors are employed in terrestrial systems are vision or infrared (IR) camera, IR spectrometers and Light detection and ranging systems (LIDAR) [3, 4, 5].

Paper 5:

Title: IoT Based Forest Fire Detection System using Arduino and GSM Module

Publication year: 2021

Author name: Debasis parida

Summary:

Forest fires are common hazards in forests that cause a lot of harm to Wildlife as well as the Environment. It could be avoided if a robust system could be deployed in forest areas to detect the fire and alert to Fire extinguishing authority to take immediate action. In this project, the intention is to build a Forest fire detection system using IoT which would detect the fire and send an emergency alert to Authority through IoT. Here a GSM/GPRS module is used to communicate with IoT sever as usually in forest areas network bandwidth is very low or not available. Hence a 2G network is preferable to communicate with the server.

Methodology: The project consists of flame sensor Arduino Nano & SIM800L GSM/GPRS module as its primary components. The fire can be detected by the flame sensor which gives a digital output that corresponds to the Fire status and is received by the Arduino Nano. Arduino compares the signal and triggers the SIM800L in case of fire incidents. Through AT commands, SIM800L communicates with thing speak server.

2.3 PROBLEM STATEMENT DEFINITION

The fire management system in houses and industries are not very reliable, efficient, cost effective and does not have any advance processing and does not have any features like automatic alert system for admin and authorities and in many buildings there are using older fire safety system that doesn’t can even activate the sprinkler system and all of they don't communicate with each other properly to prevent false alarm also monitor the entire system using a applications**.**

Fig 2.1 Problem Statement Definition

Problem Statement (PS)	**I am (Customer)**	**I'm trying to**	**But**	**Because**	**Which makes me feel**
Problem Statement - 1	Customer	Check the alarm whether itswork or not	It does notwork properly	The alarm work lately	Worst
Problem Statement - 2	Industrialworkers	To implementfire deduction	Fire alarm isnot working	Sensor Failure	Life Threating

Table 2.1 Problem Statement Definition

CHAPTER 3

IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS

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 requires 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.

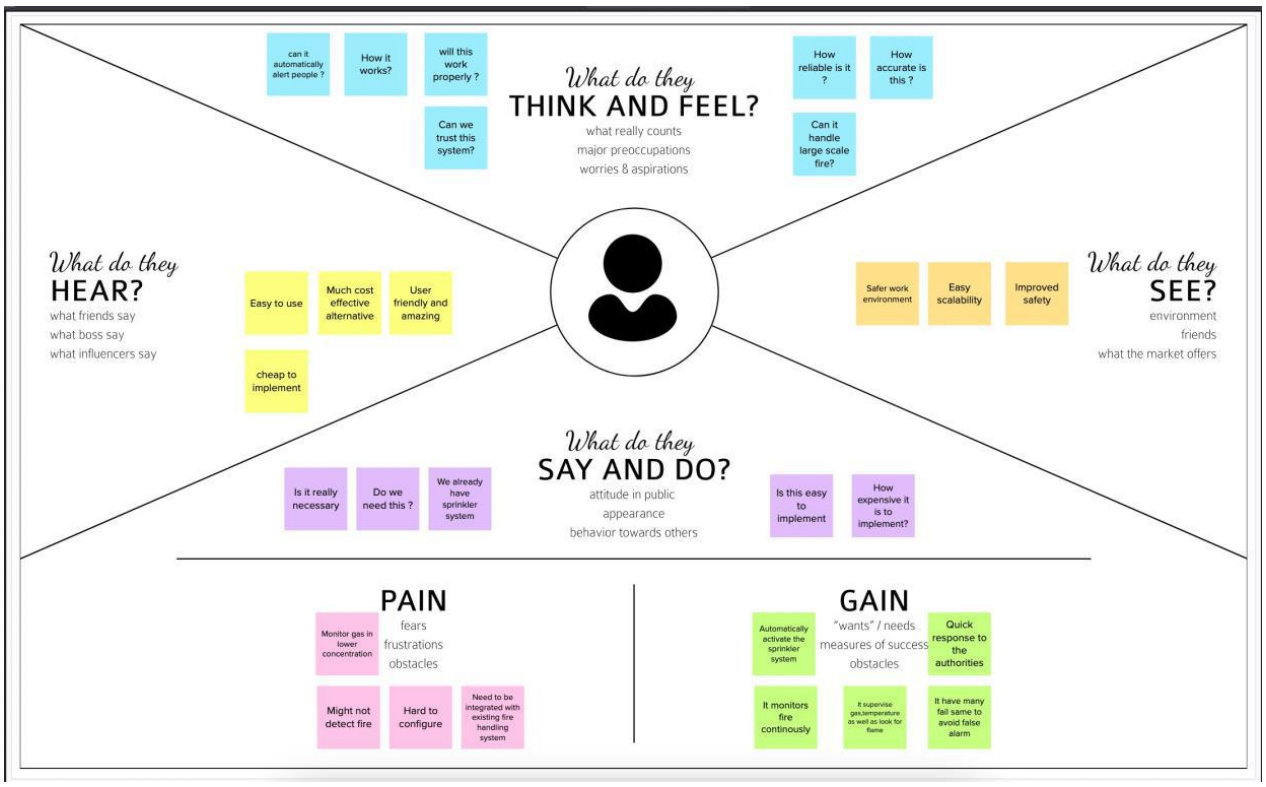


Fig 3.1 Empathy Map Canvas

3.2 IDEATION & BRAINSTORMING

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.

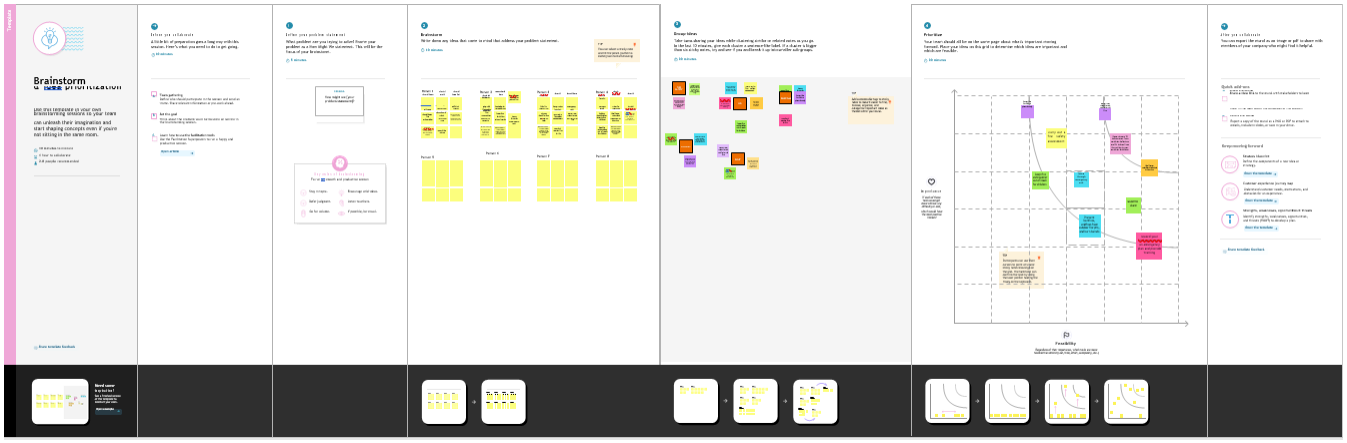


Fig 3.2 Brainstorming

3.3 PROPOSED SOLUTION

S.No.	Parameter	Description
1.	Problem Statement (Problem to besolved)	To improve the safety management system inindustries. Improving the safety management system against the fire incidents in industries.
2.	Idea / Solution description	To implement the fire safety management in industry based on IOT using Arduino uno board with fire detection and fire extinguisher system. And using some sensors (Humidity sensor, Flame sensor, smoke sensor) with GPS tracking system.
3.	Novelty / Uniqueness	Usage of liquid Nitrogen. Liquid nitrogen will immediately vaporize causing a cooling effectand makes the site deprived of oxygen. Usingwater

		sprinklers after liquid nitrogen can put off even intense fire effectively.
4.	Social Impact / Customer Satisfaction	1) Harmful gases can be purified and released into atmosphere 2) Cause of impact can be traced from the sensor data that can be analyzed to prevent future accidents.
5.	Business Model (Revenue Model)	1)This is used to calculate the probability of ignition and spread of fires across a landscape. 2)This outcome allows for a better understanding of how changes in one aspects of management can affect other aspects of management.
6.	Scalability of the Solution	It is trying to execute this technique as we need to introduce an arduino gadget which was modified with an Arduino that takes received signals from sensors .Easy operatability and maintenance. Required low time for maintain. Cost is reasonable value.

3.4 PROBLEM SOLUTION FIT

	1. CUSTOMER SEGMENT(S) Who is your customer? • Industry People	**4. EMOTION BEFORE /AFTER** How do customers feel when they face a problem before and afterwards? Before: With availability of only extinguisher they feel panic, in secured and anxious while using it. After : With the help of our intelligent fire management system, since it is an automatic system they don't need to panic. They feel relaxed and able to handle the situation without anxiety.	**7.BEHAVIOUR** What does your customer do to address the problem and get the job done? • Installation of proper fire and other safety management system to ensure the safety of the industry. • The industry workers need to check the web app notifications like alert message. so, that they can take mandatory actions.
	2. JOBS TO BE DONE/PROBLEMS Which jobs-to-be-done (or problems) do you address for your customers? • Reducing the cause priorly through indication of message to the Employees through an immediate alerting system	**5. AVAILABLE SOLUTION** Which solutions are available to the customers when they face problem? • Fire detection and alarm system • Smoke removal and ventilation system • Extinguishing systems (gas, sprinklers)	**8.CHANNELS OF BEHAVIOUR** Online: • To provide an indication about fire cause through the message (SMS). Offline: • Protecting the accidental area by automatic fire extinguisher

	3. TRIGGER **What triggers customers to act?** • Improving the fire management system • Giving awareness to Employees	**6. CUSTOMER CONSTRAINTS** **What constraints prevent your customers from taking action or limit their choices of solutions?** • All industry workers need to have a smart devices(smart phone) and also must have connected network. • Well monitoring system	**9. PROBLEM ROOT CAUSE** **What is the real reason that this problem exists? What is the back story?** • Failure of Machinery and other equipment's. • Electrical short circuiting or overloading • Chemical Reaction/Runway Reaction.
	10. YOUR SOLUTION Detect the presence of fire and Alerting the industrial workers and its presence to the fire officials through internet. and save the property and life of people. And Usage of automatic sprinklers along with liquid nitrogen is able to put off a large fire break out. In case of toxic gas leakage, they are purified and released into the atmosphere.		

Fig 3.3 Problem Solution Fit

CHAPTER 4

REQUIREMENT ANALYSIS

4.1 FUNTIONAL REQUIREMENT

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Sensing function	Fire breakout has to be sensed by smoke detectors. Gas leakage has to be sensed by gas sensors.
FR-2	Alerting function	Blaring of alarms.
FR-3	Actuation function	Activation of sprinklers. Turning ON the exhaust Fan.
FR-4	Notification	Sending SMS to the Authorities. Sending SMS with location to the fire station.

4.2 NON-FUNCTIONAL REQUIREMENT

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	Ease of use and longevity of the system.
NFR-2	**Security**	Software remains secured in the face of attacks.
NFR-3	**Reliability**	High accuracy.
NFR-4	**Performance**	Faster response.
NFR-5	**Availability**	Availability of the systems for institutions, restaurants and other public places
NFR-6	**Scalability**	It accommodates easy modification for various requirements

CHAPTER 5

PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS

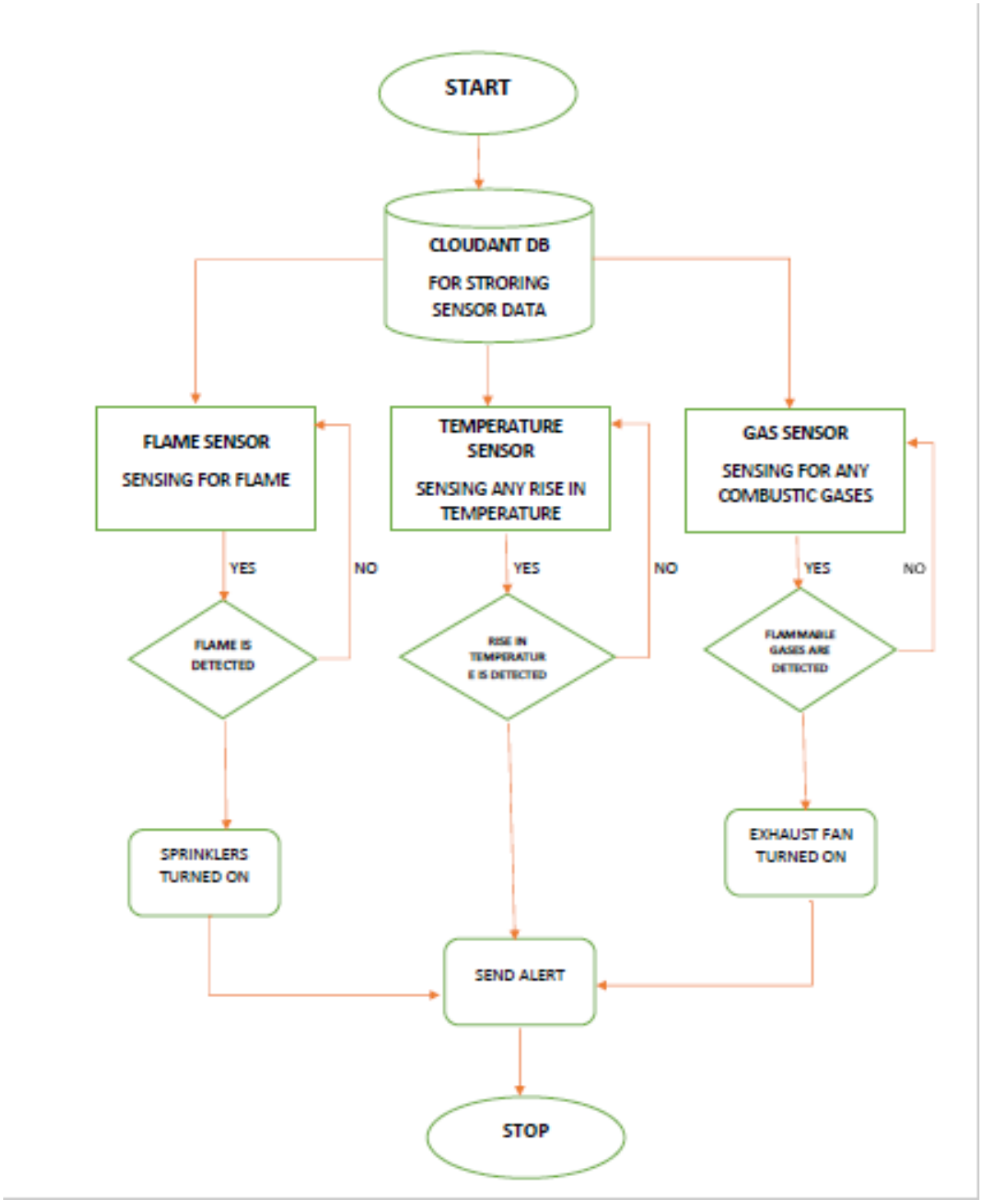


Fig 5.1 Data Flow Diagram

5.2 SOLUTION & TECHNICAL ARCHITECTURE

5.2.1 SOLUTION ARCHITECTURE

The architecture consists Arduino Uno which is interfaced with a temperature sensor, a smoke sensor and buzzer. The temperature sensor senses the heat and smoke sensor senses any smoke generated due to burning or fire. Buzzer connected to Arduino gives us an alarm indication .Whenever the density of smoke and the temperature goes higher than a predetermined range, the device will send a signal to the nearby fire department and activate the buzzer. This would activate the sprinklers so that it can extinguish the fire.

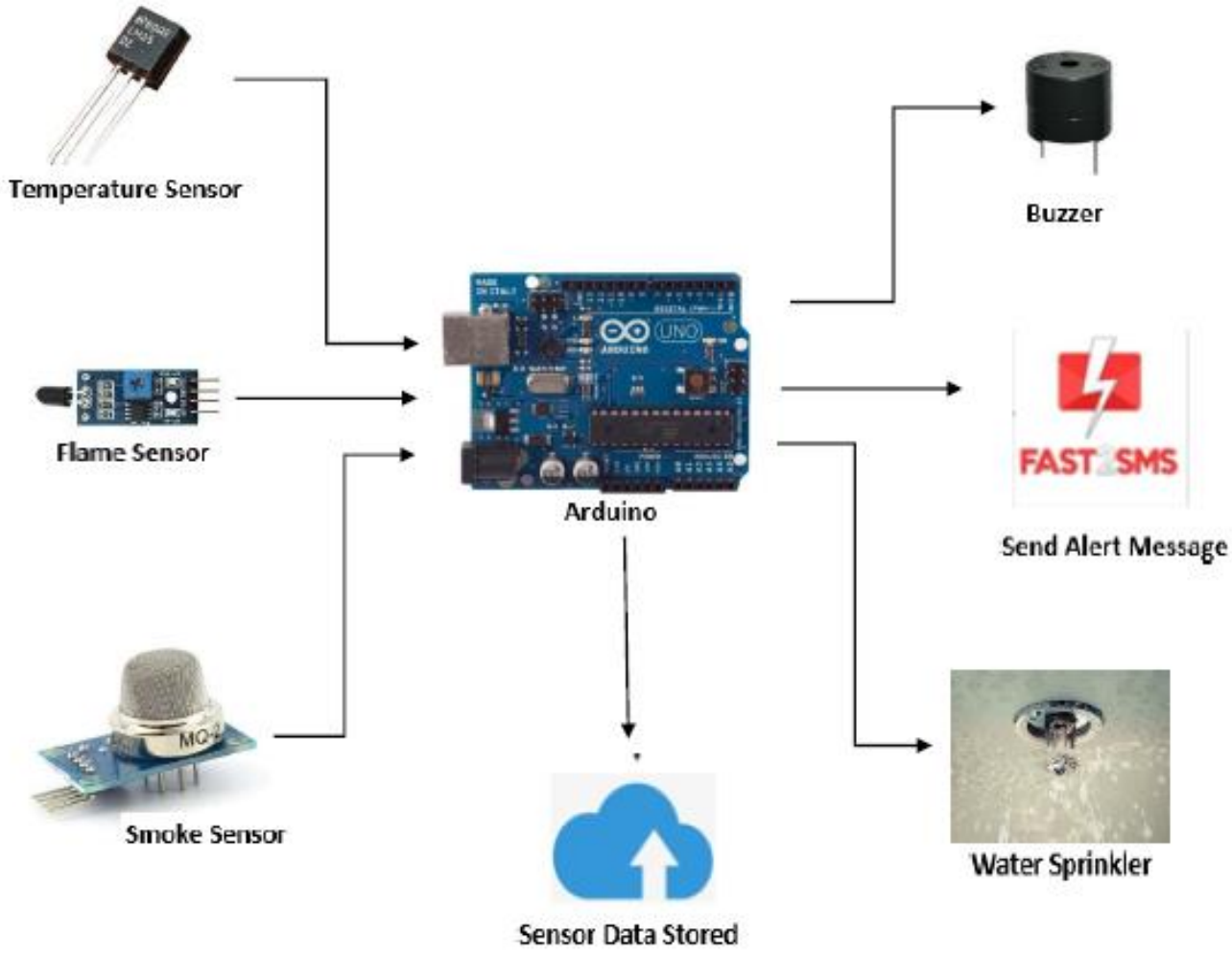


Fig 5.2 Solution Architecture Diagram

5.2.2 TECHNICAL ARCHITECTURE

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2

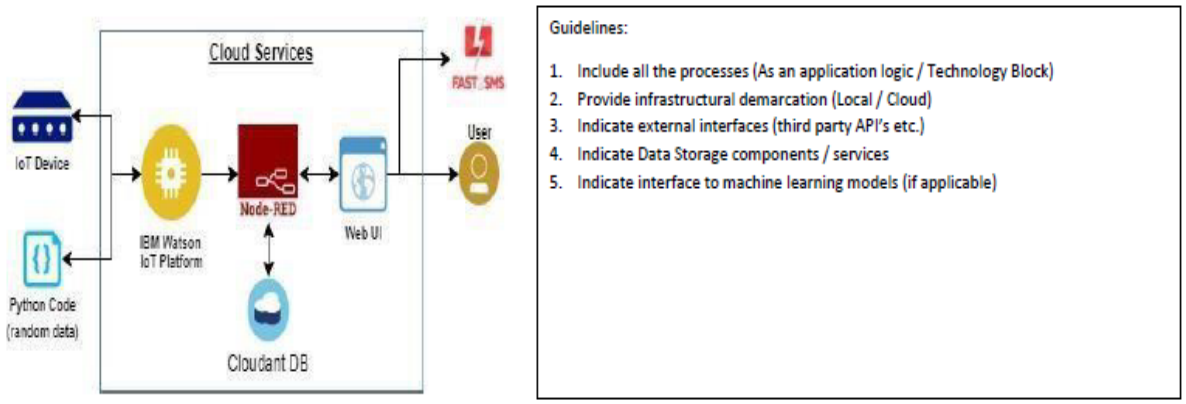


Fig 5.3 Technical Architecture Diagram

S.No	Component	Description	Technology
1.	User Interface	Web UI, Node-RED, MIT app	IBM IoT Platform, IBM Node red, IBMCloud
2.	Application Logic-1	Create Ibm Watson IoT platform and create node-red service	Ibm Watson, ibm cloudant service,ibmnode-red
3.	Application Logic-2	Develop python script to publish and subscribe toIBM IoT Platform	python
4.	Application Logic-3	Build a web application using node-red service	IBM Node-red
5.	Database	Data Type, Configurations etc.	MySQL
6.	Cloud Database	Database Service on Cloud	IBM DB2, IBM Cloudant
7.	File Storage	Developing mobile application to store and receivethe sensors information and to react accordingly	Web UI,python
8.	External API-1	Using this IBM fire management API we can track the temperature of the incident place and wherethe	IBM fire management API

		fire had been attacked.	
9.	External API-2	Using this IBM Sensors it detects the fire, gas leaks , temperature and provides the activation of sprinklers to web UI	IBM Sensors
10.	Machine Learning Model	Using this we can derive the object recognition model	Object Recognition Model
11.	Infrastructure (Server / Cloud)	Application Deployment on Local System / CloudCloud Server Configuration	IBM cloudant, IBM IoT Platform

Table 5.1 Components & Technologies

S.No	**Characteristics**	**Description**	**Technology**
1.	Open-Source Frameworks	MIT app Inventor	MIT License
2.	Security Implementations	IBM Services	Encryptions, IBM Controls
3.	Scalable Architecture	sensor-IoT Cloud based architecture	cloud computing and AI
4.	Availability	Mobile, laptop, desktop	MIT app
5.	Performance	Detects the Fire, gas leak,temperature	sensors

Table 5.2 Application Characteristics

5.3 USER STORIES

User Type	Functional Requirement(Epic)	User Story Number	User Story / Task	Acceptanc ecriteria	Priority	Release
Customer (Industry)	Assembling	USN-1	As a user, I must position the sensors in the appropriate location.	I have access to my sensor triggers	High	Sprint-1
		USN-2	As a user, I must test my hardware to ensure that it is operational.	I can use the serial monitor to keep track of all sensor values.	High	Sprint-1
	User Registration	USN-3	As a user, I can create user accounts for the model's essential software.	I can sign up and utilize user Login to access the dashboard.	Medium	Sprint-2
		USN-4	As a user, I can verify that notifications and SMS are delivered properly	I can verify the alerts via Fast2SMS	High	Sprint-1
	Cloud Monitoring	USN-5	As a user, I can keep track on how long data is kept in IBM Cloudant	I can constantly monitor and obtain sensor data.	High	Sprint-1

Table 5.3 User Stories

CHAPTER 6

PROJECT PLANNING & SCHEDULING

6.1 SPRINT PLANNING & ESTIMATION

TITLE	DESCRIPTION	DATE
IDEATION PHASE		
Literature Survey & Information Gathering	Literature survey on the selected project & gathering information by referring the, technical papers, research publications etc.	16 SEPTEMBER 2022
Prepare Empathy Map	Prepare Empathy Map Canvas to capture the user Pains & Gains, Prepare list of problem statements.	19 SEPTEMBER 2022
Problem Statement	List of problem in the project.	19 SEPTEMBER 2022
Brainstorm And Idea Prioritization	List the by organizing the brainstorming session and prioritize the top 3 ideas based on the feasibility & importance.	21 SEPTEMBER 2022
Project Design Phase - I		
Proposed Solution	Prepare the proposed solution document, which includes then novelty, feasibility of idea, business model, social impact, scalability of solution, etc.	24 SEPTEMBER 2022
Problem Solution Fit	Prepare problem - solution fit document.	01 OCTOBER 2022
Solution Architecture	Prepare solution architecture document.	24 SEPTEMBER 2022
Project Design Phase - II		
Customer Journey	Prepare the customer journey maps to understand the user interactions & experiences with the application (entry to exit).	08 OCTOBER 2022
Functional Requirement	Prepare the functional requirement document.	15 OCTOBER 2022
Data Flow Diagrams	Draw the data flow diagram and submit for review.	17 OCTOBER 2022
Technology Architecture	Prepare the technology architecture diagram.	17 OCTOBER 2022
Project Planning Phase		
Prepare Project Planning & Sprint Delivery Plan	Prepare the Product Backlog, Sprint Planning, Stories and Story points.	22 OCTOBER 2022
Prepare Milestone & Activity List	Prepare the milestones &activity list of the project.	22 OCTOBER 2022
Project Development Phase		
Project Development - Delivery of Sprint-1, 2,3 & 4	Develop & submit the developed code by testing it.	IN PROGRESS

Table 6.1 Sprint Planning and Estimation

6.2 SPRINT DELIVERY SCHEDULE

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Login	USN-1	As a customer , I might ensure login credential through gmail ease manner for the purpose ofsending alert message to the owner.	2	High	Madeti Harsha Nagendra
Sprint-1	Registration	USN-2	As a user , I have to registered my details and tools details in a simple and easy manner in case of fire incident, this registered system sends notification to the industrialist.	2	High	Kannan D
Sprint-2	Dashboard	USN-3	As a user, In case of Fire in the industry I need the sprinkler to spray water on the existing fire automatically.	2	Low	Mithun B
Sprint-1	Dashboard	USN-4	As a user , I need to safeguard my properties aswell as and it will be better to send alert message to the fire department.	2	Medium	Rahul M
Sprint-1	Dashboard	USN-5	As a user , Its good to have a IOT based systemtoextinguish the fire without human presence.	2	High	Madeti Harsha Nagendra

Table 6.2 Sprint Delivery Schedule

CHAPTER 7

CODING AND SOLUTIONING

7.1 CODE

SPRINT 1

```
int Gas=A0;
int Flame=4;
int buzz=2;
int redLight=3;
int greenLight=4;
float sensorvalue;
int flamevalue;
void setup() {
pinMode(Gas, INPUT);
pinMode(Flame, INPUT);
pinMode(buzz,OUTPUT);
pinMode(redLight,OUTPUT);
pinMode(greenLight,OUTPUT);
Serial.begin(115200);
}
void loop() {
sensorvalue = analogRead(Gas);
flamevalue= digitalRead(Flame);
Serial.print("Gas value:");
Serial.println(sensorvalue);
```

```
Serial.print("flame state:");
Serial.println(!(flamevalue));
if(flamevalue==0){
tone(buzz,1000,200);
digitalWrite(redLight,HIGH);
digitalWrite(greenLight,LOW);
}
else{
noTone(buzz);
digitalWrite(redLight,LOW);
digitalWrite(greenLight,HIGH);
}
if(sensorvalue>500){
tone(buzz,1000,200);
digitalWrite(redLight,HIGH);
digitalWrite(greenLight,LOW);
}
else{
noTone(buzz);
digitalWrite(redLight,LOW);
digitalWrite(greenLight,HIGH);
}
}
```

SPRINT 2

```
#include "DHT.h"

#define DHTPIN 2

#define DHTTYPE DHT22

DHT dht(DHTPIN, DHTTYPE);

void setup() {

Serial.begin(9600);

dht.begin();

}

void loop() {

delay(1000);

float h = dht.readHumidity();

float t = dht.readTemperature();

if (isnan(h) || isnan(t) || isnan(f)) {

Serial.println("Failed to read from DHT sensor!");

return;

}

Serial.print("Humidity: ");

Serial.print(h);

Serial.print(" %\t");

Serial.print("Temperature: ");

Serial.print(t);

}
```

SPRINT 3

```
#define BLYNK_TEMPLATE_ID "TMPL-uhc59_T"

#define BLYNK_DEVICE_NAME "Fire alert"

#define BLYNK_AUTH_TOKEN "jkfkhu5fzDC9_PBdtssloT9OmXq3THwb"

#define BLYNK_FIRMWARE_VERSION "0.1.0"

#define BLYNK_PRINT Serial

//#define BLYNK_DEBUG

#define APP_DEBUG

#include <ESP8266WiFi.h>

#include <BlynkSimpleEsp8266.h>

#include "DHT.h"

#define DHTPIN 5

#define DHTTYPE DHT22

DHT dht(DHTPIN, DHTTYPE);

char auth[]=BLYNK_AUTH_TOKEN;

char ssid[]="OPPO A52";

char pass[]="6380604277";

int Gas=A0;

int Flame=4;

int buzz=2;

int redLight=3;

int greenLight=4;

float sensorvalue;

int flamevalue;
```

```
void setup() {
pinMode(Gas, INPUT);
pinMode(Flame, INPUT);
pinMode(buzz,OUTPUT);
pinMode(redLight,OUTPUT);
pinMode(greenLight,OUTPUT);
Serial.begin(115200);
Blynk.begin(auth,ssid,pass);
dht.begin();
}
void loop() {
sensorvalue = analogRead(Gas);
flamevalue= digitalRead(Flame);
Blynk.run();
Blynk.virtualWrite(V0,sensorvalue);
Blynk.virtualWrite(V1,!(flamevalue));
Serial.print("Gas value:");
Serial.println(sensorvalue);
Serial.print("flame state:");
Serial.println(!(flamevalue));
float h = dht.readHumidity();
float t = dht.readTemperature();
if (isnan(h) || isnan(t)) {
Serial.println("Failed to read from DHT sensor!");
return;
```

```
}
Serial.print("Humidity: ");
Serial.print(h);
Serial.print(" %\t");
Serial.print("Temperature: ");
Serial.print(t);
if(flamevalue==0){
tone(buzz,1000,200);
digitalWrite(redLight,HIGH);
digitalWrite(greenLight,LOW);
}
else{
noTone(buzz);
digitalWrite(redLight,LOW);
digitalWrite(greenLight,HIGH);
}
if(sensorvalue>500){
tone(buzz,1000,200);
digitalWrite(redLight,HIGH);
digitalWrite(greenLight,LOW);
}
else{
noTone(buzz);
digitalWrite(redLight,LOW);
digitalWrite(greenLight,HIGH);
```

```
}

}
```

SPRINT 4

```
#include<SoftwareSerial.h>

#include<TinyGPS.h>

SoftwareSerial gsm(7,8);

#define BLYNK_TEMPLATE_ID "TMPL-uhc59_T"

#define BLYNK_DEVICE_NAME "Fire alert"

#define BLYNK_AUTH_TOKEN "jkfkhu5fzDC9_PBdtssloT9OmXq3THwb"

#define BLYNK_FIRMWARE_VERSION "0.1.0"

#define BLYNK_PRINT Serial

//#define BLYNK_DEBUG

#define APP_DEBUG

#include <ESP8266WiFi.h>

#include <BlynkSimpleEsp8266.h>

#include "DHT.h"

#define DHTPIN 5

#define DHTTYPE DHT22

DHT dht(DHTPIN, DHTTYPE);

char auth[]=BLYNK_AUTH_TOKEN;

char ssid[]="OPPO A52";

char pass[]="6380604277";

int Gas=A0;

int Flame=4;

int buzz=2;
```

```
int redLight=3;
int greenLight=4;
float sensorvalue;
int flamevalue;
void setup() {
pinMode(Gas, INPUT);
pinMode(Flame, INPUT);
pinMode(buzz,OUTPUT);
pinMode(redLight,OUTPUT);
pinMode(greenLight,OUTPUT);
Serial.begin(115200);
Blynk.begin(auth,ssid,pass);
dht.begin();
gsm.begin(9600);
}
void loop() {
sensorvalue = analogRead(Gas);
flamevalue= digitalRead(Flame);
Blynk.run();
Blynk.virtualWrite(V0,sensorvalue);
Blynk.virtualWrite(V1,!(flamevalue));
Serial.print("Gas value:");
Serial.println(sensorvalue);
Serial.print("flame state:");
Serial.println(!(flamevalue));
```

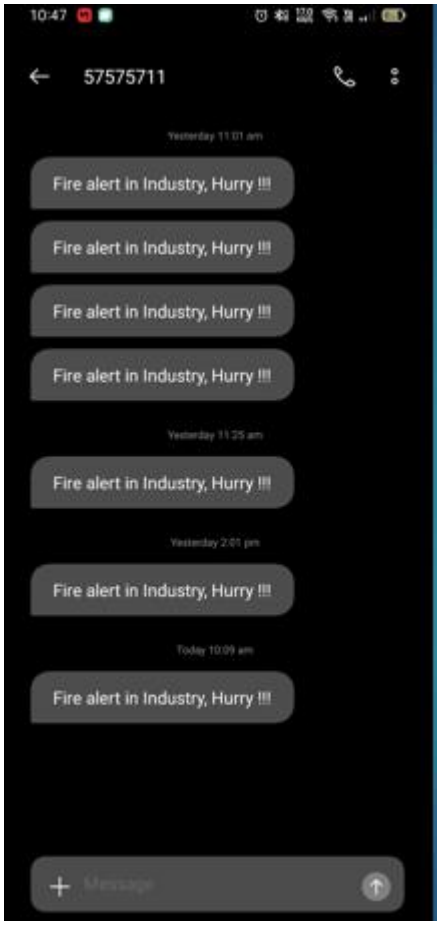
```
float h = dht.readHumidity();
float t = dht.readTemperature();
if (isnan(h) || isnan(t)) {
Serial.println("Failed to read from DHT sensor!");
return;
}
Serial.print("Humidity: ");
Serial.print(h);
Serial.print(" %\t");
Serial.print("Temperature: ");
Serial.print(t);
if(flamevalue==0){
tone(buzz,1000,200);
digitalWrite(redLight,HIGH);
digitalWrite(greenLight,LOW);
gsm.println("AT+CMGF=1\r");
delay(1000);
gsm.print("AT+CSMP=17,167,0,0\r");
delay(1000);
gsm.println("AT+CMGS=\"+916380604277\"\r");//replace x by your number
delay(1000);
gsm.write("Fire alert\n");
delay(100);
```

```
gsm.write("location:Latitude:13.0663,Longitude:80.1112
currentlocation:http://maps.google.com/maps?&z=15&mrt=yp&t=k&q=13.0663,80.1
112");
delay(100);
gsm.println((char)26);
delay(1000);
}
else{
noTone(buzz);
digitalWrite(redLight,LOW);
digitalWrite(greenLight,HIGH);
}
if(sensorvalue>500){
tone(buzz,1000,200);
digitalWrite(redLight,HIGH);
digitalWrite(greenLight,LOW);
gsm.println("AT+CMGF=1\r");
delay(1000);
gsm.print("AT+CSMP=17,167,0,0\r");
delay(1000);
gsm.println("AT+CMGS=\"+916380604277\"\r");//replace x by your number
delay(1000);
gsm.write("Gas has Leakead\n");
delay(100);
```

```
gsm.write("location:Latitude:13.0663,Longitude:80.1112
currentlocation:http://maps.google.com/maps?&z=15&mrt=yp&t=k&q=13.0663,80.1
112");
delay(100);
gsm.println((char)26);
delay(1000);
}
else{
noTone(buzz);
digitalWrite(redLight,LOW);
digitalWrite(greenLight,HIGH);
}
}
```

CHAPTER 8

RESULT



CHAPTER 9

ADVANTAGES AND DISADVANTAGES

8.1 ADVANTAGES

- Cost effective for larger applications.
- The location of a fire condition is detected and recorded at each individual device, identifying exactly where the fire is occurring. This will improve response time for emergency responders.
- Lower ongoing service cost, because when a device goes into trouble (i.e. needs cleaning, repair or replacement), the panel will tell you the exact location of the device needing service.
- Online capabilities: New intelligent panels have the capability to provide detailed online notification of alarm/trouble/supervisory events.

8.2 DISADVANTAGES

- Cost, not as competitively priced for smaller applications.
- Typically with an intelligent panel, your peripheral devices (i.e. smoke detectors, etc…) tend to be more expensive than conventional devices.
- This panel is computer like and at times there maybe issues caused by the firmware (panel software). However, this is not common and the advantages of intelligent panel far outweigh any of these firmware issues.

CHAPTER 10

CONCLUSION

In conclusion, Industry-specific intelligent fire management system Using SMS can be a value effective and medium coverage method of detecting, alerting and controlling fire and fire related incidents in an exceedingly residential setting or industrial environment. It makes use of a well-recognized technology and takes advantage of SMS capabilities so on realize its proposed goal effectively. this system work would save cost, provide reliable services, and alert nearest department of authorities, thereby reducing (or even eradicating) loss of lives and property. Its applications range from the common household setting even to large industrial environments.

The Industry-specific intelligent fire management system can reduce the casualties of the disaster in industries to prevent the employees, industrial machines and infrastructure by providing appropriate evacuation guidance. The system can also aid disaster fighting with the help of water sprinklers and give alert to fire station because it allows for a quick assessment of the disaster with decentralized control that can intelligently guide evacuees based on the detection of humans.

CHAPTER 10

FUTURE SCOPE

Fire alarm systems, however, are designed and installed in the majority of applications for life safety. The only detector that is used for this application is the smoke detector. Smoke detectors and smoke alarms are and remain as the single best method for the early detection of a fire and have saved countless lives. These devices however have one principle problem, they are a source for unwanted alarms.

Since the first generation of smoke detectors were released, there have been a number of advancements to both decrease the time of detection while at the same time decrease the activation of the detector when the products of combustion are not present. Smoke detectors and alarms are migrating from just the detection of smoke, to combination detectors and multicriteria detectors.

The future will be with multicriteria detection in which the detector will be more of a sensor, with the detection more for the products of combustion, such as carbon monoxide, carbon dioxide, sulfur dioxide, nitrogen oxides in addition to heat and particulate matter.