# IBM NALAIYA THIRAN 2022-23 PROJECT REPORT

**PROJECT NAME**

# INDUSTRY-SPECIFIC INTELLIGENT FIRE MANAGEMENT SYSTEM

**TEAM ID**

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# 1. INRODUCTION

## PROJECT OVERVIEW

The Fire Detection Systems are now widely used in various safety and security applications. The major amount of fire starts due to the electric short circuit. It leads to damageto property and also loss of life. To avoid that or to minimize the damage caused by fire outbreaks due to electric short circuits an IoT technology is used to control such a kind of risk. Traditional fire detection systems are not that effective and quick to alert the owner about fire,in case no one is present on the location. To overcome this problem in this paper we present the design and development of IoT based Fire Detection System.

A system that combines qualities for fire, temperature and smoke detection, sending alert Text Message about the fire to the user along with onsite alarm (buzzer), updating temperature, humidity and smoke on Thing Speak cloud every 15 seconds, and it also moves manually with the help of Android Application. The Fire Detection System consists of four main parts: Multiple sensors, communication system (Bluetooth, GSM, NodeMCU), motion planning(Manual patrolling), and Android application for manual patrolling of the system. This Fire Detection system can be used in college, school, office, and industry for safety purposes. At present, safety is still attracting the attention of world. And in the all kinds of disaster, the fire occurrence frequency of fire is high rate and damages more.

With the rapid development of science and technology, late model fire monitor and alarm systems are merged new semiconductor technique and artificial intelligent theory Although traditional fire detect and alarm system may be satisfied either fire detection in a certain extent, there are some defects, such as uncertainty sensitivity of fire detector, deficiency ability in self-diagnosis and self-elimination which fire detection system is adopted instructure. There is some scarcity in transport and communication fire signal in real system is not satisfied with fire detection in modern time. Intelligent fire detect and alarm control system is of fire signal detected, transmitted, processed and controlled system.

And smoke fog, temperature, and flame of fire detect and alarm system is proposed based on IOT. Fire is very dangerous situation and it’s very much necessary to monitor and give warning before anything unwanted happens. In many developing countries,

houses do not come fitted with fire alarm system This results in fire being attended and leading to IoT of loss of property, human and so also in developing countries like India we do not have strict laws pertaining to installation of Fire Alarm system So there is an urgent need to wards developing an automated fire monitoring and warning system.

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 Intelligent Building ofthe 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. In the wireless fire alarm, individual units are powered by primary & secondary batteries for the communication.

## PURPOSE

Fire alarm systems are only effective if they can generate reliable and fast fire alerts with exact location of fire. There is a direct correlation between the amounts of damage caused by fire and interventions time in various fire alarm systems. As the time of intervention decreases, the damage also decreases. Hence the most important factor in a fire alarm systemis the reaction or response time of fre alarm system, that is, the time between fire detection and extinguishing.

We are developing a fire monitoring and controlling device which sense the fire and display the message on monitor screen and if the value of sensor will cross a specific threshold value it will take action autonomously. A basic web page has been designed for displaying the temperature, humidity value. It also has some other buttons to take control action regarding relay which will turn on and off different AC equipment of the building. We are storing the reading of sensor in the database for further analysis of the system. ESP8266 Wifi module has used in our project. All devices with specific IP address are connected to router this connection gives us best result for local operation purpose through XMLHTTP request we are handling the webpage with the help of set interval function for reading the value of Temperature and Humidity

The earliest recorded examples of fire protection can be traced back to the Roman Empire and the catastrophic fires that started in Rome. As a result, Emperor Neron has adopted regulations that required fire proof material for walls and buildings restoration to be used. The second recorded case of adopting fire protection regulations occurred in the year 1666, after the Great fire of London,which destroyed more than 80% of the city. The fire of London spurred interest in the development of the first equipment for fire suppression in the form of hand pumps and fire hydrant installation for water supply.

Node-RED consists of a Node.js based runtime that you point a web browser at to access the flow editor. Within the browser you create your application by dragging nodes from your palette into a workspace and start to wire them together. With a single click, the application is deployed back to the runtime where it is run.

The palette of nodes can be easily extended by installing new nodes created by the community and the flows you create can be easily shared as JSON files. The name was a light-hearted play on words sounding like 'Code Red'. It stuck and was a great improvement on whatever it was called in the first few days. The 'Node' part reflects both the flow/node programming model as well as the underlying Node.JS runtime. We never did come to a conclusion on what the 'RED' part stands for. "Rapid Event Developer" was one suggestion, but we've never felt compelled to formalize anything. We stick with 'Node-RED'.

Node-RED provides a browser-based flow editor that makes it easy to wire together flows using the wide range of nodes in the palette. Flows can be then deployed to the runtime in a single-click. JavaScript functions can be created within the editor using a rich text editor. A built-in library allows you to save useful functions, templates or flows for re-use.

RELAY: A relay is a form of electrical switch that is operated by electromagnet which changes over the switching when current is applied to the coil. These relays may be operated by switch circuits where the switch cannot take the high current of the electrical relay,or they may be operated by electronic circuits, etc. In either circumstance they provide a very simple and attractive proposition for electrical switching.

# 2. LITERATURE SURVEY

## EXISTING PROBLEM

The study began with a literature review in order to obtain the right assessment criteria to be adopted. In conducting the research, the authors made direct observations of fifty high-rise buildings. These included office buildings, hotels, malls, and commercial.

When a building is attacked by fire, its sustainability is directly affected, which inturn affects the surrounding environment and the welfare of the community. Therefore, the hazards associated with fire outbreaks in buildings need to be addressed efficiently and effectively.

This can be done through fire safety practices and awareness campaigns on the causes of fire, prevention and suppression techniques, and the provision of adequate fire fighting equipment Thus, they are not much concerned about the fire hazards that can occur in the environment where they live. Jakarta has recorded more than 500 fire outbreaks per year in the past five years.

## REFERENCES

Ahmed Imteaj, Tanveer Rahman, Muhammad Kamrul Hossain, Mohammed Shamsul Alam, Saad Ahmad Rahat, "An IoT based fire alarming and authentication system forworkhouse using Raspberry Pi 3" , International Conference on Electrical, Computer and Communication Engineering (ECCE), IEEE, 2017

Ondrej Krejcar, "Using of mobile device localization for several types of applications in intelligent crisis management",5th IEEE GCC Conference & Exhibition, IEEE, 2009

Karwan Muheden, Ebubekir Erdem, Sercan Vançin, "Design and implementation of the mobile fire alarm system using wireless sensor networks", 17th International Symposiumon Computational Intelligence and Informatics (CINTI), IEEE, 2016

Azka Ihsan Nurrahman, Kusprasapta Mutijarsa, "Intelligent home management system prototype design and development", International Conference on Information Technology Systems and Innovation (ICITSI), IEEE, 2015

Al Mamari, A. R. M. H., Al Mamari, H., Kazmi, S. I. A., Pandey, J., & Al Hinai, S. (2019). IoT based Smart Parking and Traffic Management System for Middle East College. Paper presented at the 2019 4th MEC International Conference on Big Data and Smart City (ICBDSC).

# PROBLEM STATEMENT DEFINITION

## Problem Statement (Problem to be solved)

To improve the safety management system in industries. Improving the safety management system against the fire incidents in industries.

## 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.

## Novelty / Uniqueness

An Integrated system of temperature monitoring, gas monitoring, fire detection automatically fire extinguisher with accuration of information about locations and response through SMS notification and call.

## Social Impact / Customer Satisfaction

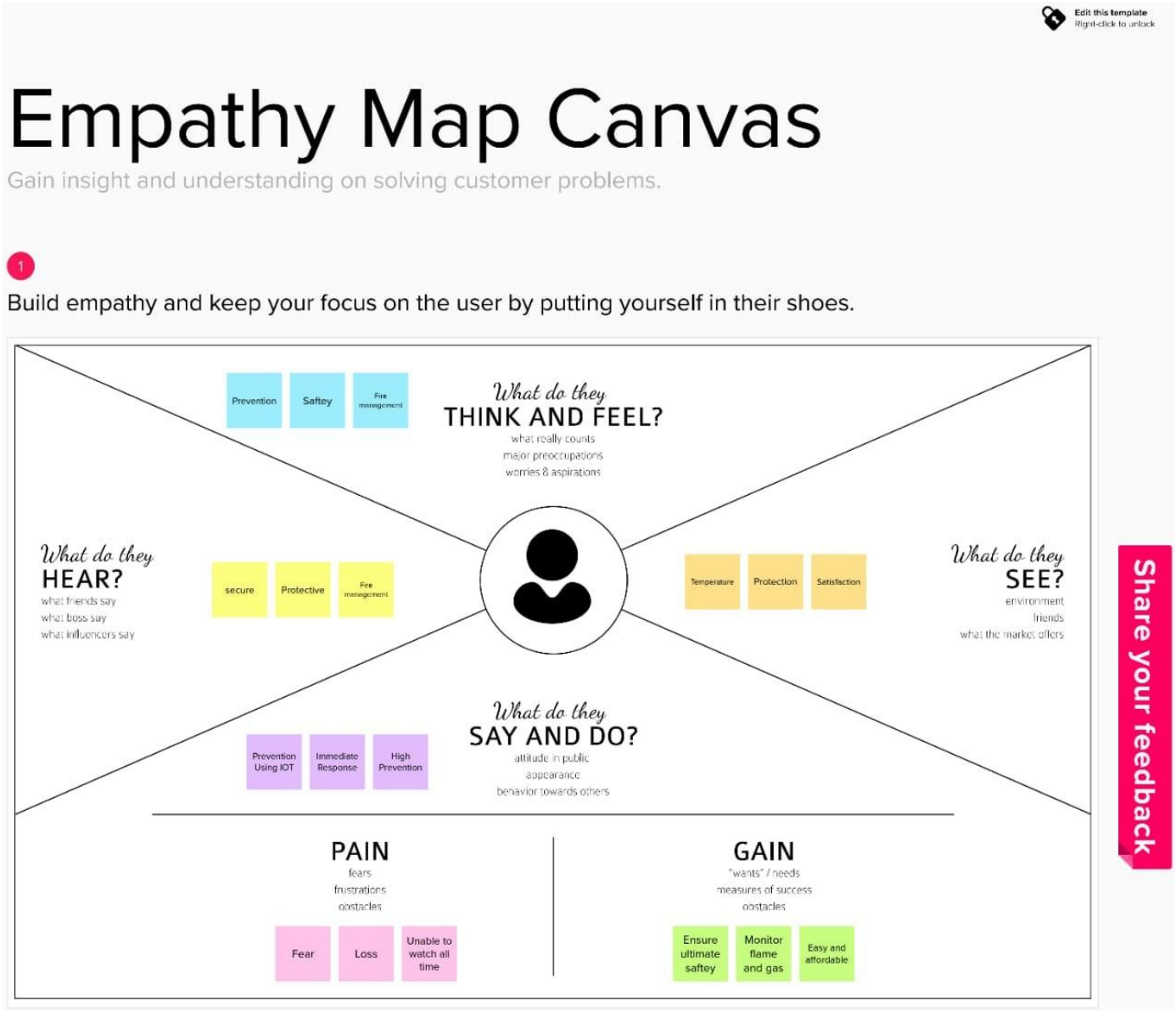
It early prevents the accident cost by fire in industries. Nearby locations so maximum extend more accurate reliability. Compatability design integrated system

## Business Model (Revenue Model)

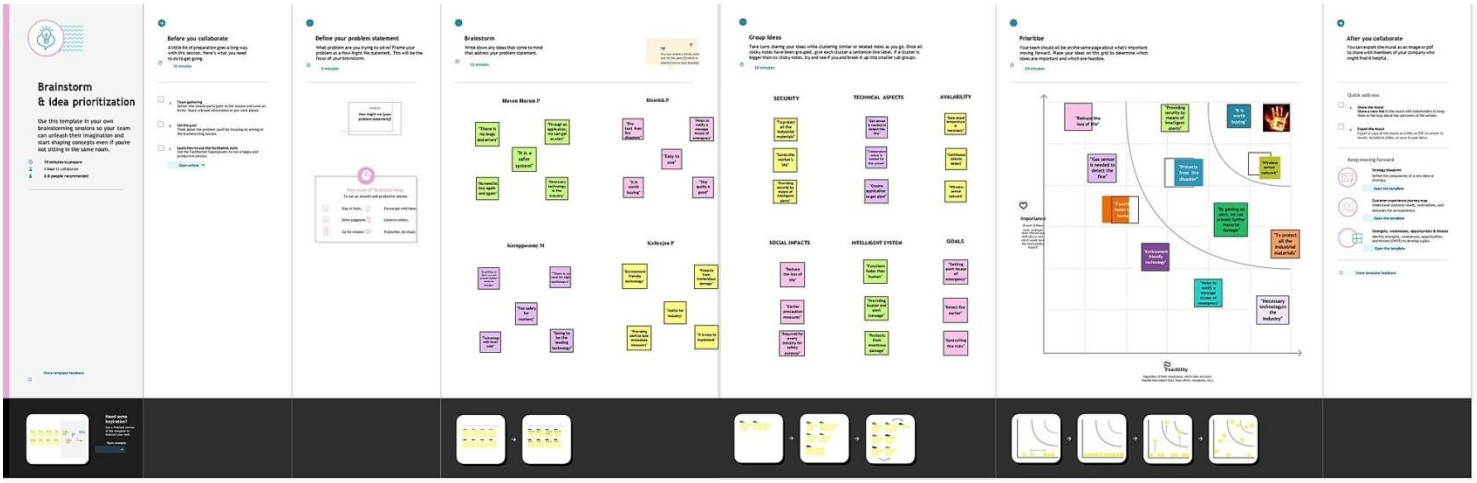
This product can be utilized by a industries .this can be thought of as a productive and helpful item as industries great many current rescuing people and machine from the fire accident. Scalability of the Solution It is trying to execute this technique as we need to introduce an arduino gadget which 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. IDEATION AND PROPOSED SOLUTION

## EMPATHY MAP CANVAS



# IDEATION AND BRAINSTORMING



## PROPOSED SOLUTION

In this work we report the development of a solution based on IoT (Internet of Things), following an approach based on Citizen Science. We elaborate on the mobile approach proposed in [1] by further enhancing the supporting platform as well as by developing from inception an IoT device specialized in the fire risk assessment and rural fire detection.

The main objective is to empower the end user with the ability to collect weather and environmental data (using a smart phone or a dedicated device) that can be used to calculate the fire risk index in real-time and with higher granularity than the one that is offered by traditional platforms. We hope this contribution can be used in the near future as a tool for decision-making by the relevant fire authorities, enabling better forest fire prevention and response.

## PROBLEM SOLUTION FIT

### 1.CUSTOMER SEGMENTS

Persons owing the

- Large Buildings
- Malls
- Industries
- Factories
- Hospitals etc….

### 2. JOBS TO BE DONE/PROBLEMS

- Industry-specific fire management system
- Reducing the incident of fire accidents
- Reducing the cause priority through indication of message to the customer

**3. TRIGGERS**

- Providing awareness to the public.
- Giving Precautions and warning.
- Improving the fire management system
- Educating the fire management system

**4. EMOTIONS:**

**Before:**

- Difficult to prevent the fire incidents in advance
- Loss of resources
- Larger reduction labor due to fire hazards

**After:**

- Early preventions
- Industries resource
- Reduction of manpower
- Fire causes

**5.AVAILABLE SOLUTIONS**

- Fire detection and alarm system
- Smoke removal and ventilation system
- Extinguishing systems (gas, spark)

## 6. CUSTOMER CONSTRAINTS

- Integrated fire management system
- Well monitoring system
- Reasonable cost
- Accurate result of accident

## 7.BEHAVIOUR

- Proper installation and placement for system
- Regular maintains
- Repairing of equipment's is fault occurs
- Perfect keep up of records.

## 8. CHANNELS OF BEHAVIOUR

**Online:**

To provide an indication about fire cause through the message (SMS) and sharing the location through the customer

**Offline:**

Protecting the accidental area by automatic fire extinguisher.

## 9. PROBLEM ROOT CAUSE

- Some electrical hazards
- Faulty equipment's
- Human error

- Other flammables or compostable materials
- Need- To reduce the risk of injuries and building damage the fire can cause.
- To protect people (workers)and resource

**10. YOUR SOLUTION**

To improve the safety management system in industries. Improving the safety management system against the fire incidents in industries.

# 4. REQUIREMENT ANALYSIS

## FUNCTIONAL REQUIREMENT

| FR No. | Functional Requirement(Epic) | Sub Requirement (Story / Sub-Task) |
|---|---|---|
| FR-1 | User Registration | Registration through website or application Registration through Socialmedias Registration through LinkedIn |
| FR-2 | User Confirmation | Verification via Emailor OTP |
| FR-3 | User Login | Login through website or App using the respective username and password |
| FR-4 | User Access | Access the app requirements |
| FR-5 | User Upload | User should be able to upload the data |
| FR-6 | User Solution | Data report should be generated and deliveredto user for every 24 hours |
| FR-7 | User Data Sync | API interface to increase to invoice system |

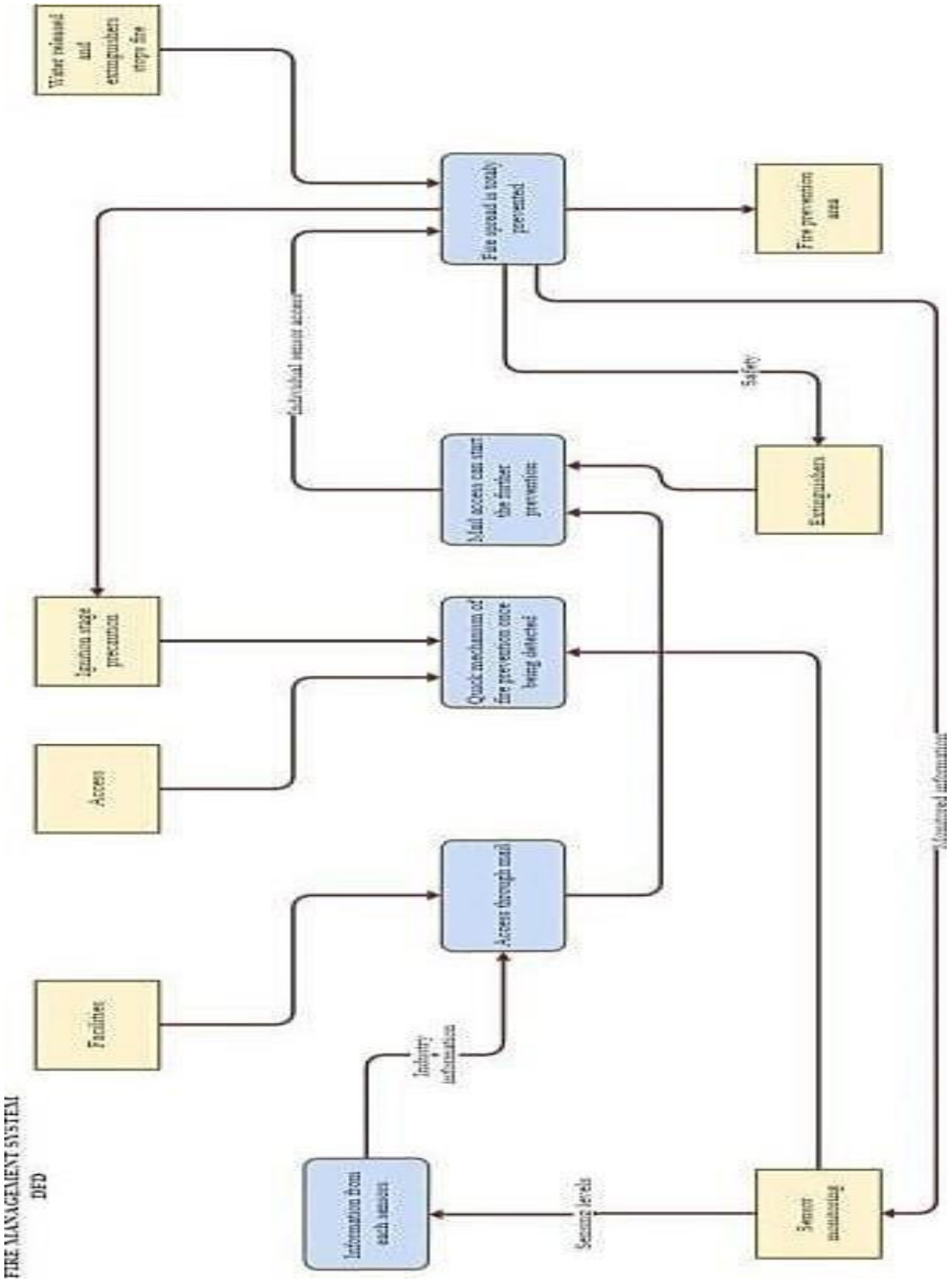
## NON-FUNCTIONAL REQUIREMENT

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

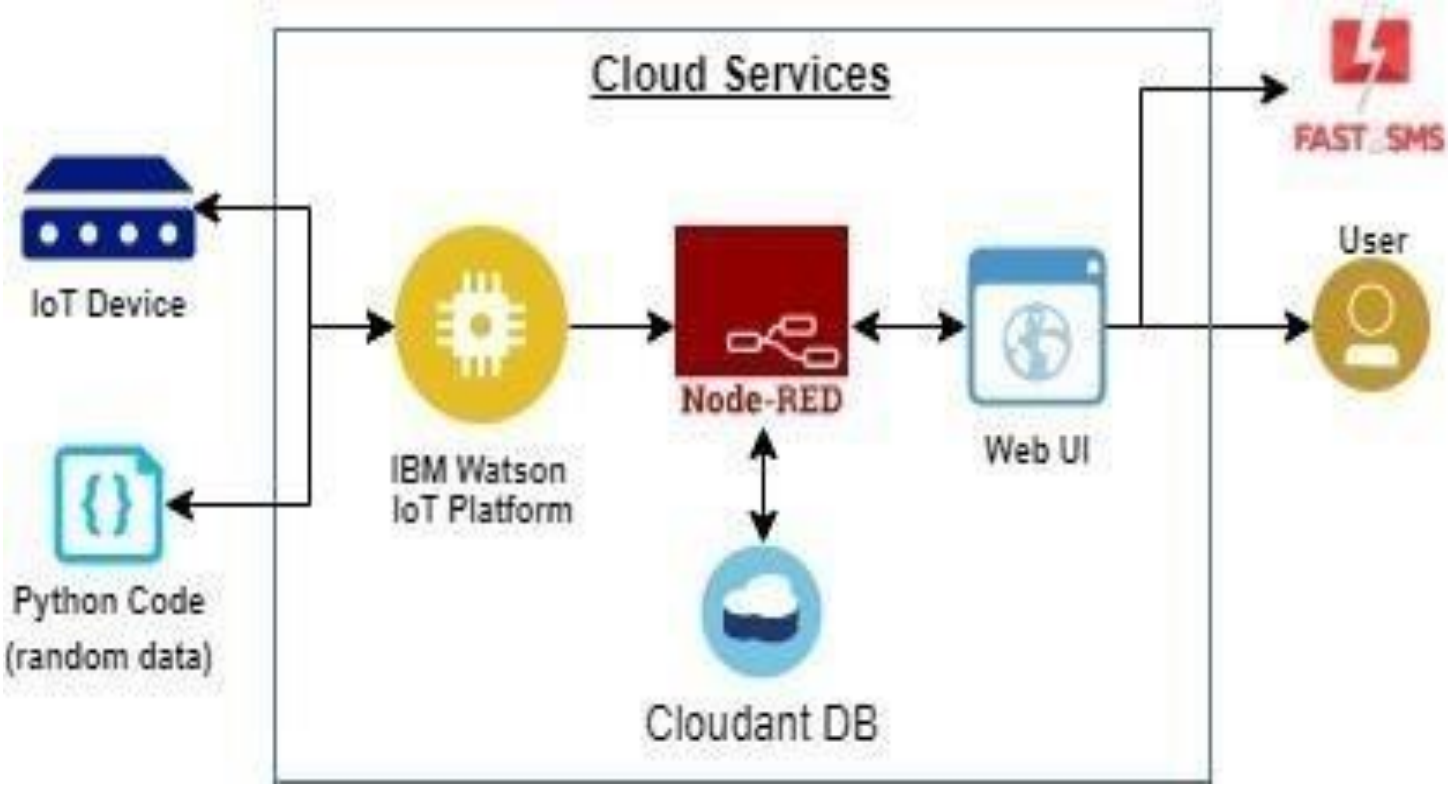
| FR No. | Non-Functional Requirement | Description |
|---|---|---|
| NFR-1 | **Usability** | Usability requirements includes language barriers and localization tasks. Usability can be assessed by Efficiency of use. |
| NFR-2 | **Security** | Access permissions for the particular system information may only be changed by the system's data administrator. |
| NFR-3 | **Reliability** | The database update process must roll back all related updates when any update fails. |
| NFR-4 | **Performance** | The front-page load time must be no more than 2 seconds for users that access the website. |
| NFR-5 | **Availability** | New module deployment must not impact front page, product pages, and check out pages availability and mustn't take longer than one hour. |
| NFR-6 | **Scalability** | We can increase scalability by adding memory, servers, or disk space. On the other hand, we can compress data, use optimizing algorithms. |

# 5. PROJECT DESIGN

## DATA FLOW DIAGRAM



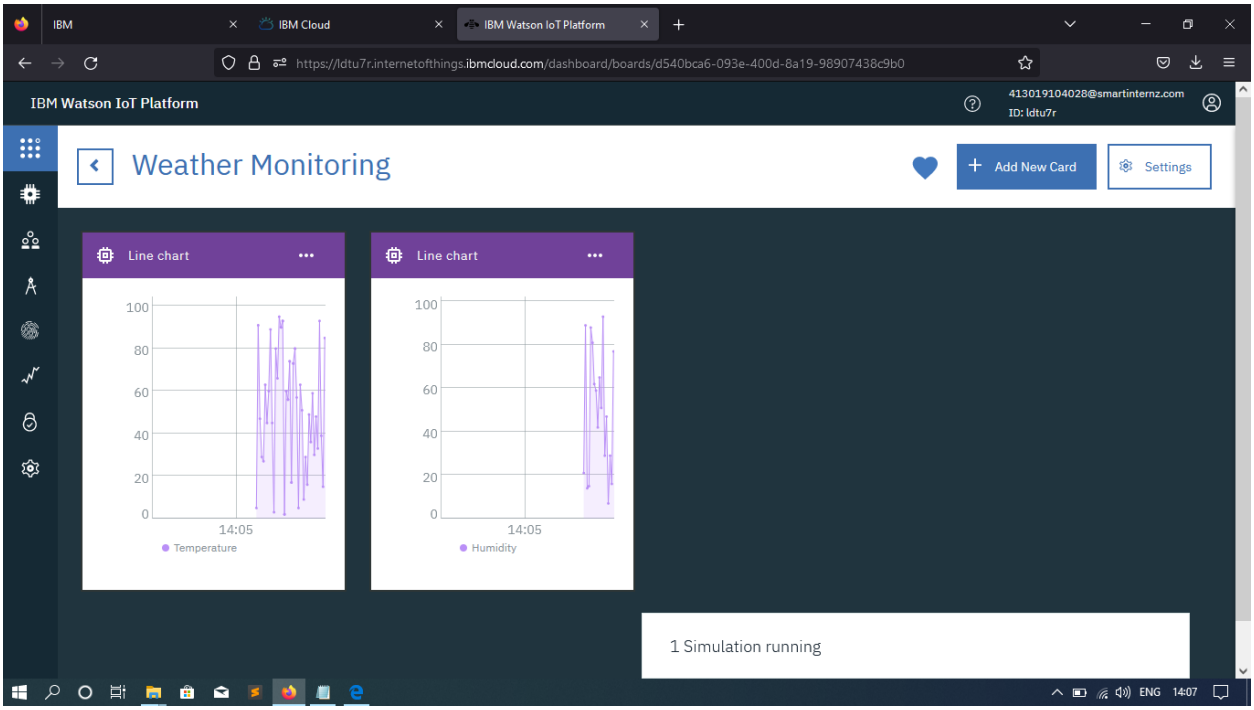
## SOLUTION ARCHITECTURE




The mobile applications for Android devices have been developed for data collection and visualization, and for analysis and decision making. The collection application allows to notify fires, capture geo referenced photographs, collect environmental data allowing the calculation of the fire hazard index.

The administration application allows the construction of heat maps with risk index values and also allows the management of information and users. These applications will communicate through data stored on the Firebase server.

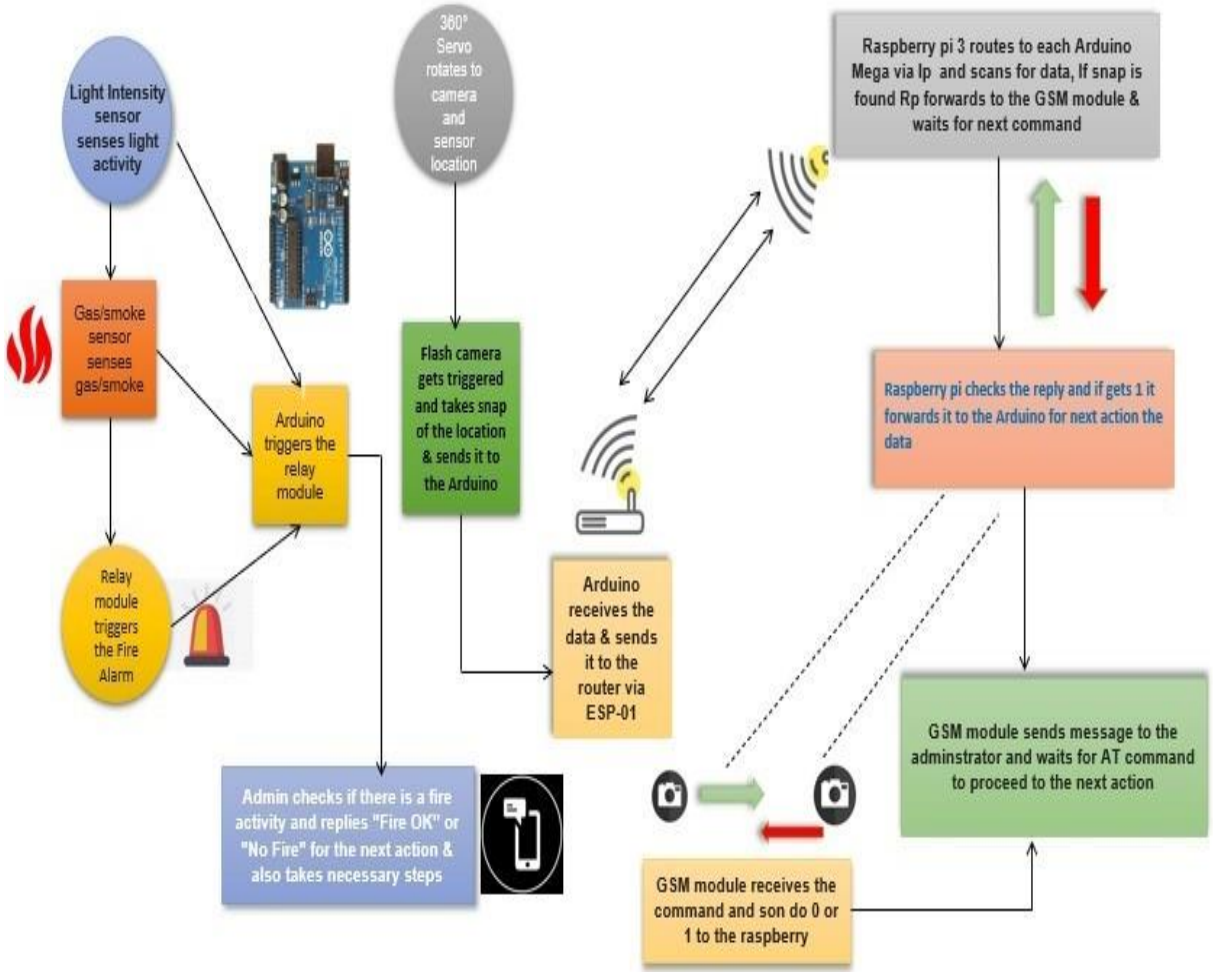
The users should create an account and login to the application. The screen displays a map with the user's location, you can go to a menu containing severaloptions: register a Raspberry Pi, take photos, notify fires, add records, view all records made by all users as well as view heat maps.




The "Register Raspberry Pi" activity allows volunteers to register a device that will collect weather data, registration is done by scanning the device's Quick Response code, the user's location (where the device will be located) and the phone number for emergencies.

In the "Add Records" activity users have two options: (1) prone areas or (2) burned areas. In the first option, the user selects an image captured on site and enters the weather data (temperature, relative humidity, wind and amount of precipitation in the last 24 hours). This data, used for the calculation of the FWI, may be collected using the Raspberry Pi already registered or may be entered manually based on measurements made by the user (e.g. from portable weather station).

## TECHNICAL ARCHITECTURE




The technical architecture states that the gas/smoke in the industry can be identified by the gas/smoke sensor. Then the settled modules are triggered with the fire alarm with the sense of light. The light provides the sense throughout the place to identity the particular place of fire. These processes are happened through the Arduino.

It should send the message to the admin. Here, the admin will be notified and moves to the next process. The process is happening in long range so we are making possible with the GSM module. The camera captures the image of the place and send to the admin mobile application. The admin will verify whether it is a high fire or low fire.

## USER STORIES

We must have proper fire protection design for buildings to avoid great percentage of the dangers. The construction graph in India is undergoing a sharp spike in the last few years. Because high rise industrial buildings are being constructed everywhere across the country. The interruptions that a fire incident brings to any industry are extremely dreadful. Recovering from it requires a lot of time, money and effort. The losses are also immense. Most often, a complete recovery is impossible for many. Such losses greatly hinder the development of a growing country like India.

Hence it is very vital to consult Industrial electrical consultants to implement appropriate fire safety measures to fight disastrous risks like fire.

# 6. PROJECT PLANNING AND SCHEDULING

## SPRINT PLANNING AND ESTIMATION

| Sprint | Functional Requirement (Epic) | User Story Number | User Story / Task | Story Points | Priority | Team Members |
|---|---|---|---|---|---|---|
| Sprint-1 | Sensing | USN-1 | Use the sensors to sense the surroundings. | 3 | High | NITHISH KUMAR B<br>JEBARAJ A<br>PARAMA SIVAM E<br>DAVID CHRISTOPHER S |
| | Operating | USN-2 | Activating the fire sprinkler system and exhaust fan in case of a fire | 3 | Medium | NITHISH KUMAR B<br>JEBARAJ A<br>PARAMA SIVAM E<br>DAVID CHRISTOPHER S |
| Sprint-2 | Sending collected data to the IBM Watson Platform | USN-3 | Sending IBM Watson the data fromthe sensors. | 3 | High | NITHISH KUMAR B<br>JEBARAJ A<br>PARAMA SIVAM E<br>DAVID CHRISTOPHER S |
| | Node red | USN-4 | Data transmission from IBMWatson to Node Red. | 3 | High | NITHISH KUMAR B<br>JEBARAJ A<br>PARAMA SIVAM E<br>DAVID CHRISTOPHER S |
| Sprint-3 | Storing of sensor data | USN-5 | Keeping data in a Cloudant database. | 2 | Medium | NITHISH KUMAR B<br>JEBARAJ A<br>PARAMA SIVAM E<br>DAVID CHRISTOPHER S |
| | Registration | USN-6 | My email and password are being entered to confirm the authenticationprocess. | 1 | Medium | NITHISH KUMAR B<br>JEBARAJ A<br>PARAMA SIVAM E<br>DAVID CHRISTOPHER S |
| | Web UI | USN-7 | Keeps track of environmental conditions and presents sensor data. | 3 | High | NITHISH KUMAR B<br>JEBARAJ A<br>PARAMA SIVAM E<br>DAVID |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | CHRISTOPHER S |
| Sprint-4 | Fast SMS Service | USN-8 | When parameters like temperature, flame, and gas sensor readings exceed the threshold value, use Fast SMS to send an alarm message. | 3 | High | NITHISH KUMAR B<br>JEBARAJ A<br>PARAMA SIVAM E<br>DAVID CHRISTOPHER S |
| | Turn ON/OFF the actuators | USN-9 | In that case, the user has the option toturn off both the sprinkler system and the exhaust fan. | 2 | Medium | NITHISH KUMAR B<br>JEBARAJ A<br>PARAMA SIVAM E<br>DAVID CHRISTOPHER S |
| | Testing | USN-10 | Project and final deliverables testing. | 1 | Low | NITHISH KUMAR B<br>JEBARAJ A<br>PARAMA SIVAM E<br>DAVID CHRISTOPHER S |

## SPRINT DELIVERY SCHEDULE

| 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 | 6 | 6 Days | 13 NOV 2022 | 19 NOV 2022 | 6 | 19 NOV 2022 |
| Sprint-2 | 6 | 6 Days | 13 NOV 2022 | 19 NOV 2022 | 6 | 19 NOV 2022 |
| Sprint-3 | 6 | 6 Days | 13 NOV 2022 | 19 NOV 2022 | 6 | 19 NOV 2022 |
| Sprint-4 | 6 | 6 Days | 13 NOV 2022 | 19 NOV 2022 | 6 | 19 ov 2022 |

# 7. CODING & SOLUTION

## 7.1 FEATURES

- IoT device
- IBM Watson IoT Platform
- Node red
- Cloudant DB
- Web UI
- MIT App Inventor
- Python code
- Wokwi

## IBM Watson

IBM Watson is AI for business. Watson helps organizations predict future outcomes, automate complex processes, and optimize employees' time.

## Node red

Node-RED consists of a Node.js based runtime that you point a web browser at to access the flow editor. Within the browser you create your application by dragging nodes from your palette into a workspace and start to wire them together. With a single click, the application is deployed back to the runtime where it is run.

## MIT App Inventor

MIT App Inventor is an intuitive, visual programming environment that allows everyone even children to build fully functional apps for smart phones and tablets. Those new to MIT App Inventor can have a simple first app up and running in less than 30 minutes.

## Wokwi

Wokwi is an online Electronics simulator. You can use it to simulate Arduino, ESP32, and many other popular boards, parts and sensors. Here are some quick examples of things you can make with Wokwi: Arduino Uno "Hello World"

# 8. TESTING

## TEST CASES

| S.NO | INPUT | OUTPUT | RESULT |
|---|---|---|---|
| **1** | Gas:42<br>Temperature:59.30<br>Flame:267 | Exhaust Fan: Not Working<br>Sprinkler: Not Working<br>Status Logged: Done | PASSED |
| **2** | Gas:612<br>Temperature:59.30<br>Flame:367 | Exhaust Fan: Working<br>Sprinkler: Not Working<br>Status Logged: Done | PASSED |
| **3** | Gas:327<br>Temperature:59.30<br>Flame:841 | Exhaust Fan: Working<br>Sprinkler: Working<br>Status Logged: Done | PASSED |
| **4** | Gas:13<br>Temperature:59.30<br>Flame:601 | Exhaust Fan: Not Working<br>Sprinkler: Working<br>Status Logged: Done | PASSED |
| **5** | Gas: 123<br>Temperature:59.30<br>Flame:385 | Exhaust Fan: Working<br>Sprinkler: Not Working<br>Status Logged: Done | PASSED |

## User Acceptance Testing

The variation of the temperature and camera angle makes the admin to stay alertby sending notification. The people will be very useful if the safety fire management is Implemented everywhere on industries.

# 9. RESULTS

## PERFORMANCE METRICS

Based on the IBM pack we choose the performance of the website varies. Built upon different ranges, a light and temperature is capable of handling the situation over the buildings. It can range up to the whole blocks of the buildings.

# 10.ADVANTAGES AND DISADVANTAGES

## ADVANTAGES

The main advantage and function of a fire alarm system is to ensure safety.
Reduced installation cost.
They monitor 24/7.
Improved security in homes, industries and offices.
It pin points location of the fire.
They help warn and keep people safe and reduce the amount of destruction.
This is probably the major reason as to why a business will install a fire detection system.

## DISADVANTAGES

Heat detectors are not considered as life saving devices because they are sensitive only to heat.

High battery or current consumption will need for these detectors.
Control panel may need to be replaced if it becomes damaged.

The system is essentially useless if the batteries aren't charged.

There is a bit of a burden to homeowners or business owners to always remember to keep the batteries fresh so the system operates properly when you need it most.

## 11. CONCLUSION

Our project is capable of serving as a replacement for static signs for a comparatively lower cost and can be implemented in the very near future. This will help reduce a lot of hard incidents happening and maintain the industry to be more safety.

## 12. FUTURE SCOPE

The function of smoke detectors and alarms is evolving from simple smoke detection to combination detectors and multi criteria detectors. The identification of more combustion byproducts, such as carbon monoxide, carbon dioxide, sulphur dioxide, and nitrogen dioxide in addition to heat and particulate matter, will be possible in the future with multi criteria detection.

Within the next ten years, video image detection (VID), which enables the isolation and detection of the picture of smoke or flame from within a room or place using analytics, will become more widely used. The VID system would also be capable of detecting the presence of a person inside the area and, through interaction with the notification appliances, would be able to give an evacuation route.

# APPENDIX

## SOURCE CODE

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

#Provide your IBM Watson Device Credentials
organization = "4aqwut"
deviceType = "12345678dt"
deviceId = "12345678did"
authMethod = "token"
authToken = "*PrtsGAO?B@_tTPEKT"

# Initialize GPIO
def myCommandCallback(cmd):
        print("Command received: %s" % cmd.data['command'])
        status=cmd.data['command']
        if status=="sprinkler on":
                print ("Sprinkler is on")
        elif status == "sprinkler off":
                print ("Sprinkler is off")
        elif status == "exhaust fan on":
                print ("Exhaust Fan ON")
        elif status == "exhaust fan off":
                print ("Exhaust Fan OFF")

#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 44
        temp=random.randint(0,100)
        flame_level=random.randint(0,100)
        gas_level = random.randint(0,100)
        data = { 'Temperature' : temp, 'Flame_Level' : flame_level, 'Gas_Level' : gas_level }
#print data

def myOnPublishCallback():
        print ("Published Temperature = %s C" % temp, "Flame_Level = %s %%" % flame_level, "Gas_Level = %s %%" %gas_level ,"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-50133-1660894586