INDUSTRY SPECIFIC INTELLIGENT FIRE MANAGEMENT SYSTEM

A PROJECT REPORT

Submitted by

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ABSTRACT

Fire Detectors play a very important role in Industries, Shops, Malls, Residential complexes, and parking areas. They help in detecting fire or smoke at an early stage and can help in saving lives. Commercial Fire detecting systems usually have an alarm signaling, with the help of a buzzer or Siren. We have designed an IOT based Fire Alerting System using Temperature, smoke and fire sensor. This project would not only signal the presence of fire in a particular premise but will also send related information through IOT.

The Internet of Things (IoT) is basically the network of 'things' by which physical things can exchange data with the help of sensors, electronics, software, and connectivity. These systems do not require any human interaction. In this Arduino fire alarm system using temperature and smoke sensors using the IOT project, we can send LIVE information like Temperature, Smoke, fire Value detected by a particular device to the Fire Department.

Fire prevention and protection in industrial plant basically include procedures for preventing, detecting and extinguishing fires. There is much to be done to promote safe systems for fire prevention. The systems should be designed to protect the employees and property and to ensure safe working systems. Fire prevention and protection in any industrial plant include fire detection system, fire alarm system, fire prevention plan and employing legal requirements relevant to fire and safety management.

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1. INTRODUCTION

1.1 PROJECT OVERVIEW

Fires are one of the most widespread cause of deaths by accident. Instant alerting to the fire department is necessary to ensure immediate action. Every minute can save many lives in such situations. So here we propose an IOT based automatic fire department alerting system that instantly and automatically alerts the fire department and informs about the situation so that immediate action can be taken. The system uses Fire sensor along with PIR sensor to efficiently detect fires and alert fire department over IOT. We use an arduino uno in order to check if a sensor is triggered. Then it reconfirms if it really is a fire outbreak using temperature sensors in order to confirm of fire outbreak. The system now uses a wificonnection to access IOT server and transmit data about this incident over internet. The system now displays the fire incident with alarm buzzer in the fire department over internet so that the fire department personnel are alerted about the incident to take necessary action.

1.2 PURPOSE:

The primary motivation for fire alarm system requirements in building and fire codes is to provide early notification to building occupants so they can exit the building and to notify the fire service so it can respond to the fire.

The fire alarm system is designed to detect fire in two main ways: smoke and heat. It should also have the capability of manual pull, in case a fire is observed before smoke or heat reaches the sensors of the system. Other systems are activated when movement in the sprinkler system is detected, indicating that the sprinklers are responding to a fire.

When the fire alarm system detects smoke, heat, or fire movement, it alerts occupants of the building using both audible and visible alarms. These alarms will be bright, loud, obnoxious, and impossible to ignore, which help mobilize individuals to follow your evacuation plan. Using both types of alarms ensure that every person in the building is alerted.

The industry's fire alarm system works in a third way to protect you: by reacting to potential risks using control measures. When the alarm is activated, some systems perform a set of tasks that help prevent fire and smoke from spreading as well as protect occupants, such as: automatically shutting doors in different zones, powering off ventilation and air conditioning, or redirecting elevators to bring cars to a designated level.

The fourth purpose of your fire alarm system is to notify authorities. This ensures the fire department is en route as quickly as possible, so they can respond and extinguish the fire before it becomes an even bigger threat.

2. LITERATURE SURVEY

2.1 EXISTING PROBLEM

- The reliability of the system cannot be found directly because the operation of the system depends on many sensors and associated parameters.
- The system will be failed if the slaves unit network has a failure.
- It will need to be connected to a WI-FI network only.
- The algorithm is very complex and need perfect condition to work efficiently.

2.2 REFERENCES

- Nitin galugade, Devika nair, Mahesh jakkar, Deepti patne, Madhur gawas, “Fire monitoring and controlling system based on IoT” in 2020
- Devanshi pandey, Rutuja pawar, Jyoti Sharma, Santosh rathod, Chetan mahajan, “ IoT based fire detection system ” in 2021.

- R.Angeline, Adithya s, Abishek narayanan, “ Fire alarm system using IoT ” in 2019
- Hussam elbehiery, “ Developed intelligent fire alarm system ” in 2012.
- Moosa Al- Ismaili, Mansoor ali, “ Smart fire warning system ” in 2012.

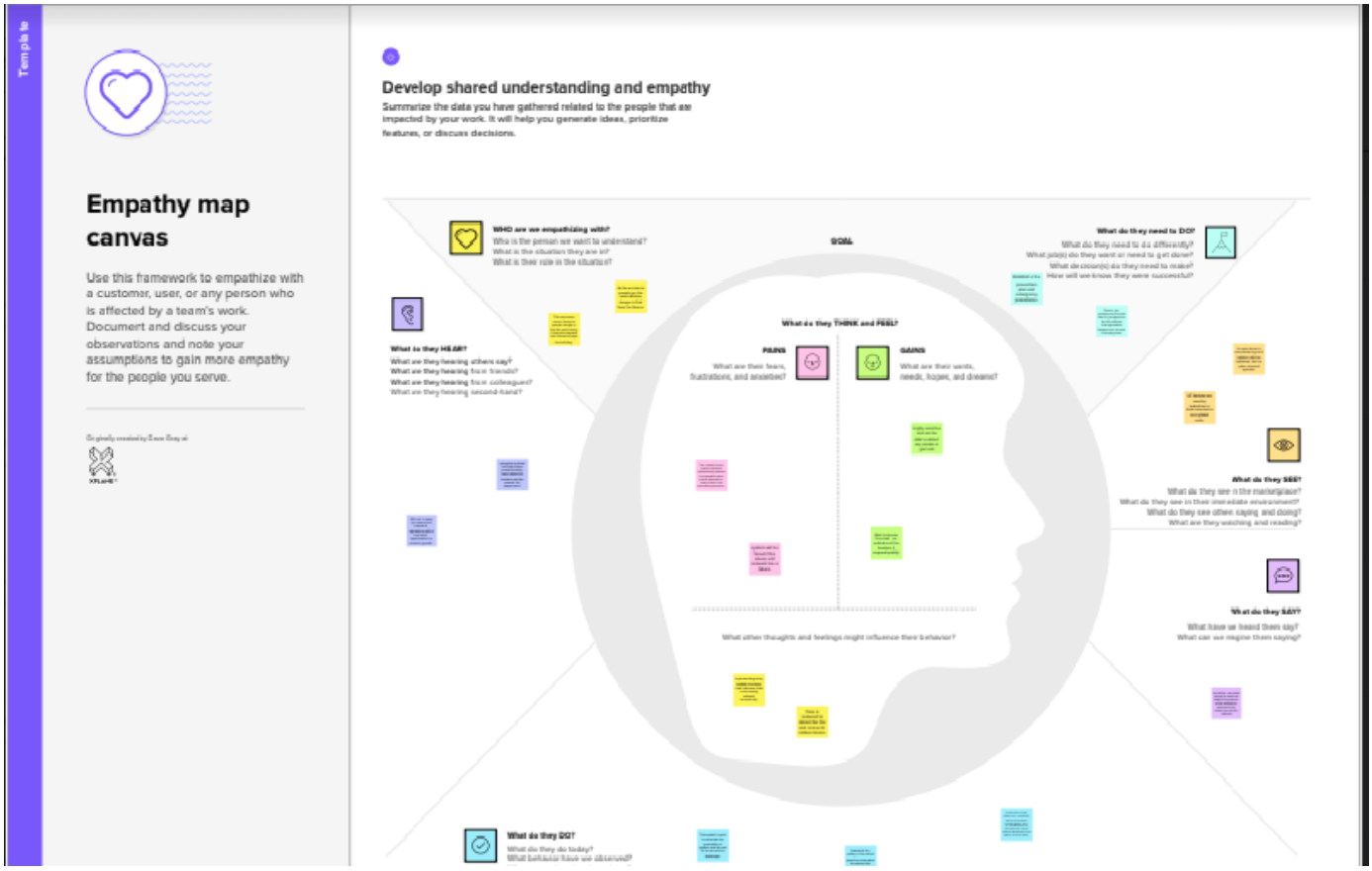
2.3 PROBLEM STATEMENT DEFINITION

A Problem Statement is a concise description of the problem or issue tobe addressed or conditions to be improved. The problem statement identifies the gap between the problem state and desired state of the process.

3. IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS

Empathy Map provides easy way for team to initialize and better understand the target users.



3.2 IDEATION & BRAINSTORMING

Brainstorming is a activity that will help to generate more innovative ideas. The process of coming up with new ideas.

Template

Brainstorm & idea prioritization

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.

10 minutes to prepare
1 hour to collaborate
2-8 people recommended

Before you collaborate

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

10 minutes

A **Team gathering**
Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.

B **Set the goal**
Think about the problem you'll be focusing on solving in the brainstorming session.

C **Learn how to use the facilitation tools**
Use the Facilitation Superpowers to run a happy and productive session.

Open article →

1 Define your problem statement

What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

5 minutes

PROBLEM

The time is take to detect and prevent the fire explosion is maximum. This is the major problem in the industry

Key rules of brainstorming

To run an smooth and productive session

- Stay in topic.
- Encourage wild ideas.
- Defer judgment.
- Listen to others.
- Go for volume.
- If possible, be visual.

2

Brainstorm

Write down any ideas that come to mind that address your problem statement.

⏱ 10 minutes

TIP

You can select a sticky note and hit the pencil [switch to sketch] icon to start drawing!

BOOMIKA

NARMATHA

SABITHA

SRIJEYAPRAKATHI

3

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

⏱ 20 minutes

IoT enabled detectors can be accessed from anywhere using mobile apps and internet connectivity

Detect fire and rescue fire quickly to reduce losses and minimize possible fatalities

TIP

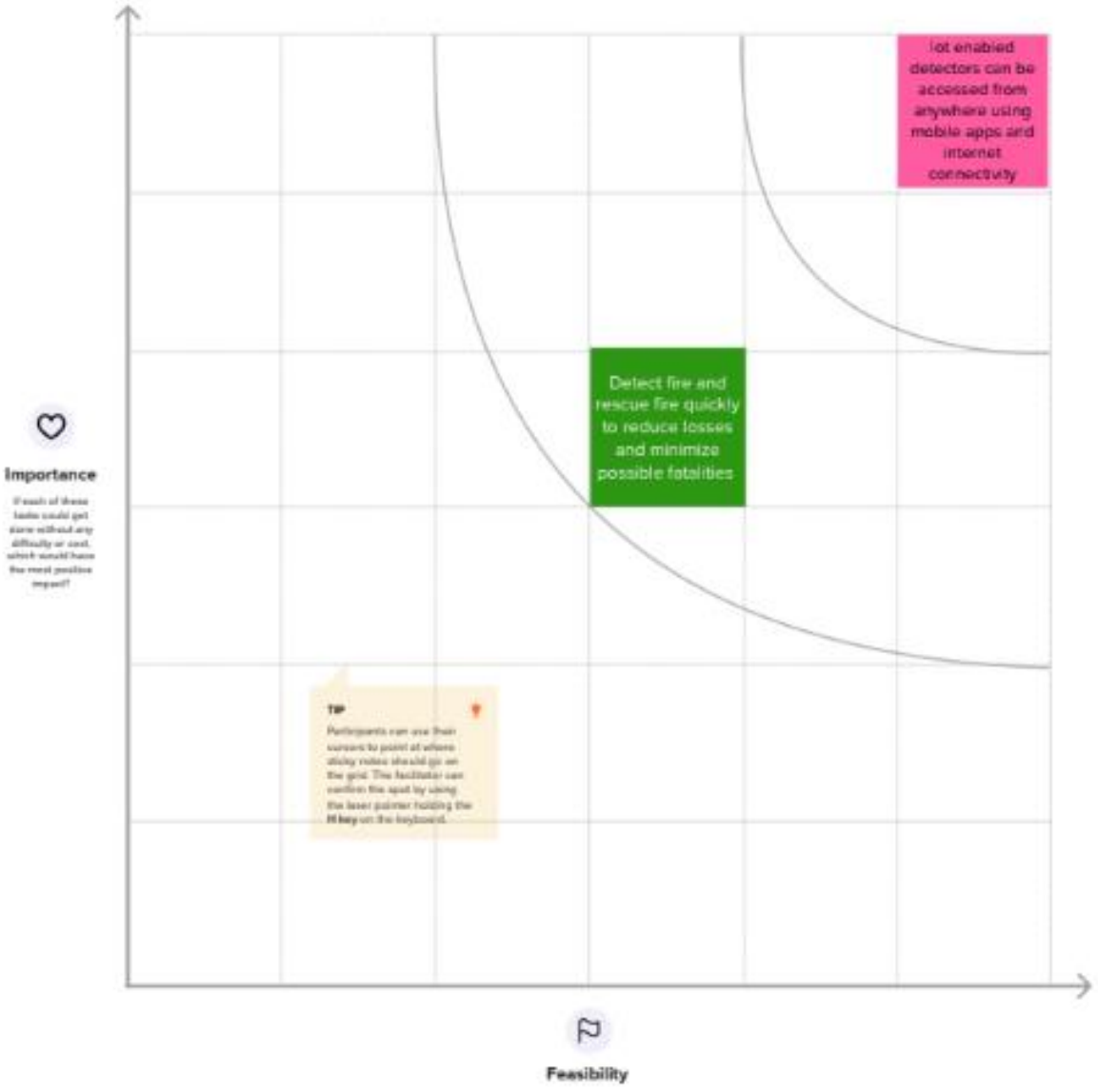
Add customizable tags to sticky notes to make it easier to find, browse, organize, and categorize important ideas as themes within your mural.

4

Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

20 minutes



3.3 PROPOSED SOLUTION

Proposed solution shows relate the current solution to desired results and describe the benefit that will accrue when the desired result is achieved.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Time for detecting the fire in the industry is longer.
2.	Idea / Solution description	Detect the presence of fire and alert its presence to the fire officials. Through mobile hotspot and internet from any Place.
3.	Novelty / Uniqueness	Time is reduced to detect the fire and rescue to reduce losses
4.	Social Impact / Customer Satisfaction	Mental and at emotional health. Wild fires create significant impact on the mental and emotional health of survivors, including increased anxiety, depression.
5.	Business Model (Revenue Model)	The fire management business model under pins a risk management model. The model is used to calculate the probability of ignition and spread of fire across a landscape. This outcome allows for a better understanding of how changes in one aspect of management can affect other aspects of management.
6.	Scalability of the Solution	Business efficient for customized fire detection, with significant cost reductions.

3.4 PROBLEM SOLUTION FIT

The problem solution fit helps us to understand the thoughts of the customer about certain job, pain, gain like behaviors and emotions.

	1.CUSTOMER SEGMENT(S) Workers is our customer	**4. EMOTION BEFORE /AFTER** If the fire is nearby, Remove occupants, enclose the area, activate alarm, call 5555, Try to fight the fire if safe to do so.	**7.BEHAVIOUR** Industrial fire safety measures include those that are intended to prevent ignition of an uncontrolled fire and those that are used to limit the development and effects of the fire after its starts.	
	2.JOBS TO BE DONE/PROBLEMS Protect the workers from the fire accident.	**5. AVAILABLE SOLUTION** Install and maintain fire alarm. Place fire alarm on our factory or industry. Tens fire alarm once a month.	**8.CHANNELS OF BEHAVIOUR OFFLINE:** Establish a fire prevention plan and emergency procedure, Inspect and maintain your equipment and facility. **ONLINE:** In online mode, incase of fire incident in industry it is quickly inform and alert to everyone.	
	3.TRIGGER In automated system, the presence of fire in the building will be picked up on by designated fire detectors. Then these fire detectors will in turn, trigger the fire alarm.	**6. CUSTOMER CONSTRAINTS** As far as risk to people go, the most appears danger is that from the flames this can cause severe burns to people caught in the fire,	9**. PROBLEM ROOT CAUSE** These accidents can occur from faulty wiring defective products, discarded cigarettes left on flammable materials, smoke and fire detectors that failed to activate.	

		particularly if they are trapped and cannot escape the building.		
	10. YOUR SOLUTION Detect the presence of fire and alert its presence to the fire officials through mobile hotspot and internet from any place.			

4. REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENT

Functional requirements may involve calculations, technical details, data manipulations and processing and other specific functionality that define what a system is supposed to accomplish.

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User monitoring	The automatic nature of fire alarm monitoring means valuable time isn't lost between the start of the emergency and first responders arriving on the scene
FR-2	User Detecting	TEMPERATURE:It is designed to measure the degree of hotness or coolness in an environment GAS: It used to detect explosive gasses and measure gas concentration FLAMES: It is a sensor designed to detect and respond to the presence of a flame
FR-3	User solving	We use the IoT can enhance the system with various other device and smart systems like sending the message to recover the critical conditions

4.2 NON-FUNCTIONAL REQUIREMENTS

Non-functional requirements define system attributes such as security, reliability, performance, maintainability, scalability, and usability.

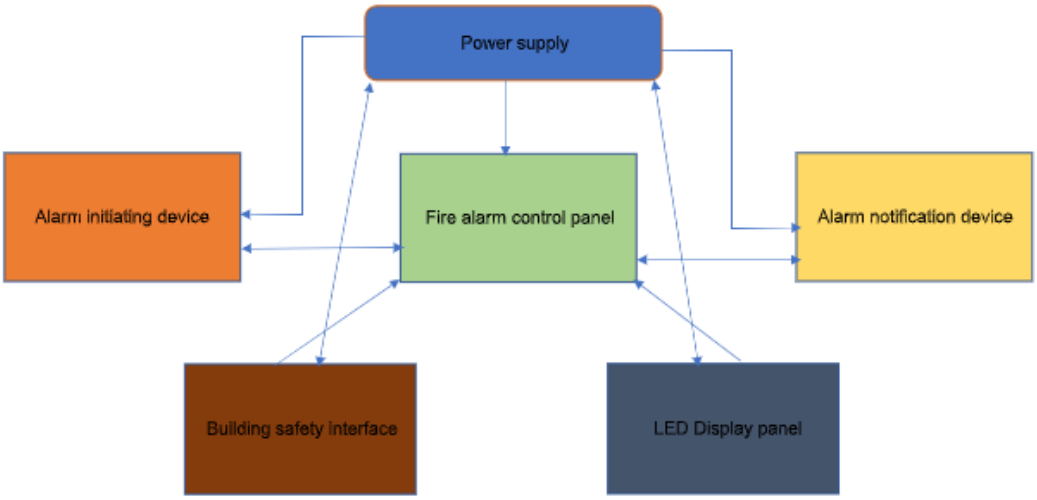
FR No	Non-Functional Requirement	Description
NFR-1	**Usability**	Fire alarm system works to protect your property and its occupants from the dangers of fire are by detecting fire, alerting occupants, managing risk and notifying the fire department
NFR-2	**Security**	Fire safety is the set of practices intended to reduce the destruction caused by fire. Fire safety measures include those that are intended to prevent the ignition of an uncontrolled fire and those that are used to limit the development and effects of a fire after its starts
NFR-3	**Reliability**	Reliable system performance could be narrowly defined in terms of failure on demand. This would ignore unwanted or false alarm as a measure of reliability
NFR-4	**Performance**	Fire safety principles for preventing fire events and managing their impact, common principles are prevention, detection, communication, occupants protection, containment and extinguishment
NFR-5	**Availability**	Install and maintain fire alarm. Place fire alarm on our factory or industry. Test fire alarm once a month
NFR-6	**Scalability**	Business efficient for customized fire detection with significant cost reductions

5. PROJECT DESIGN

5.1 DATA FLOW DIAGRAM

Data Flow Diagram is a graphicalrepresentation of a Flow of data through an information system.

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.



POWER SUPPLY:

A Power Supply is an electrical device that supplies electrical power to an electrical load

ALARM INITIATING DEVICE

These devices connect to the alarm system's control panel and are under the control panel surveillance

FIRE ALARM CONTROL PANEL :

Each device constantly communicates with the control panel through IoT technology to report its status within seconds, alarm supervisory and trouble conditions are alerted to the control panel and a precise location of the event is displayed

DISPLAY PANEL:

The display will show the location of the alarm

ALARM NOTIFICATION DEVICE:

A fire alarm notification appliance is an active fire protection component of a fire alarm system. A notification appliance may be use audiable or visible alert the workers and fire officials

5.2 SOLUTION & TECHNICAL ARCHITECTURE

SOLUTION ARCHITECTURE:

Solution Architecture is helps to ensure that a new system will fit the existing enterprise environment. It helps to understand that features to complete our project.

Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology solutions. Its goals are to:

- In automated system, the presence of fire in the building will be picked up on by designated fire detectors. Then these fire detectors will in turn, trigger the fire alarm.

- If the fire is nearby, Remove occupants, enclose the area, activate alarm, call 5555, Try to fight the fire if safe to do so
- Install and maintain fire alarm. Place fire alarm on our factory or industry. Tens fire alarm once a month.
- Industrial fire safety measures include those that are intended to prevent ignition of an uncontrolled fire and those that are used to limit the development and effects of the fire after its starts
- These accidents can occur from faulty wiring defective products, discarded cigarettes left on flammable materials, smoke and fire detectors that failed to activate.
- Detect the presence of fire and alert its presence to the fire officials through mobile hotspot and internet from any place.

EXISTED SYSTEM:

WATER SPRAY FIRE SYSTEM:

Water spray systems are permanently installed systems that take out fire through water spray from interconnected nozzles, often seen in buildings ceilings.

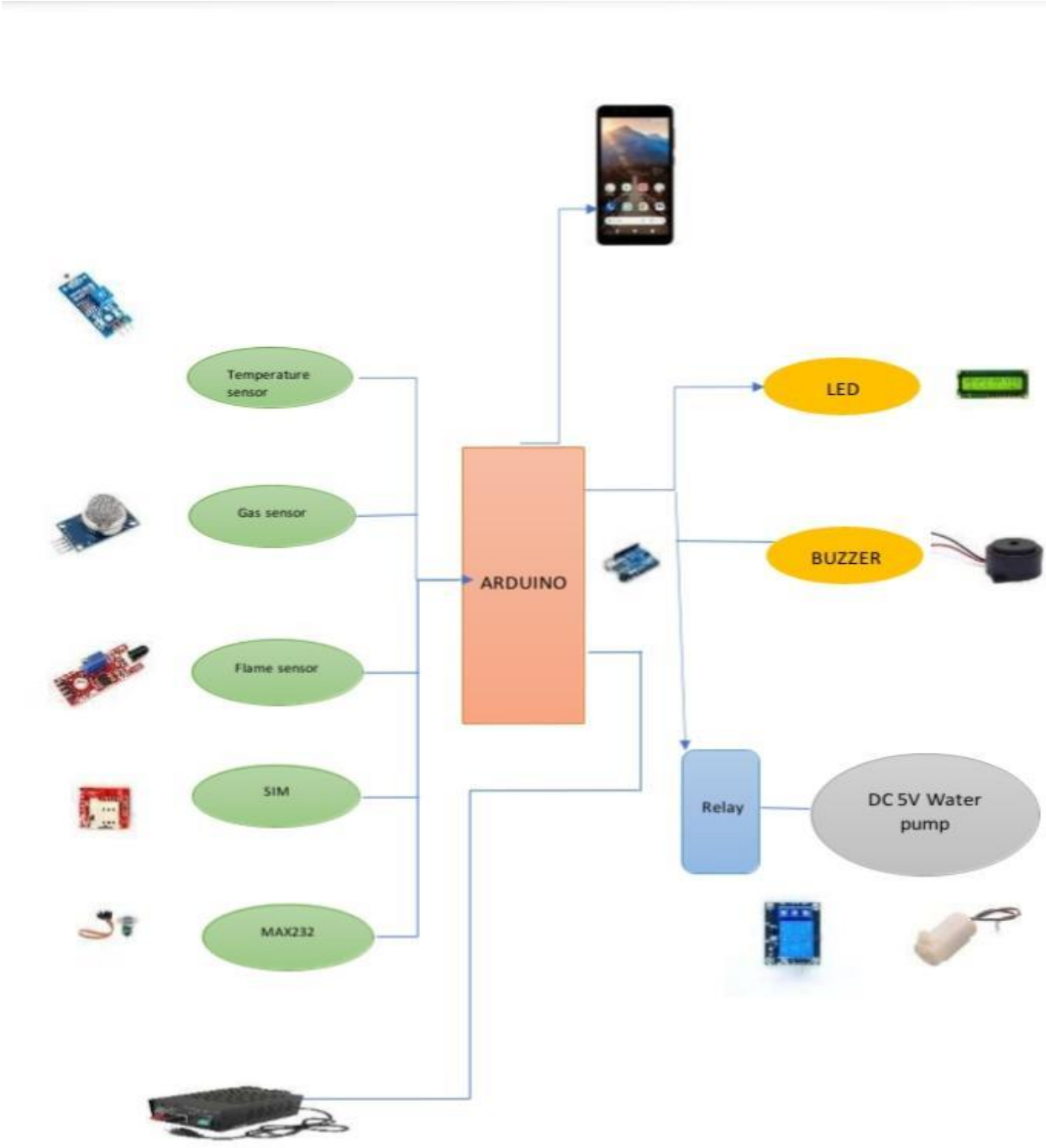
FOAM FIRE SYSTEMS:

A foam fire suppression system is a type of wet sprinkler system that combines both water and foaming agent for large scale fire extinguishment. This water based fire sprinkler system can extinguish extensive fire mere seconds with incredible efficiency.

WATER MIST FIRE SYSTEM:

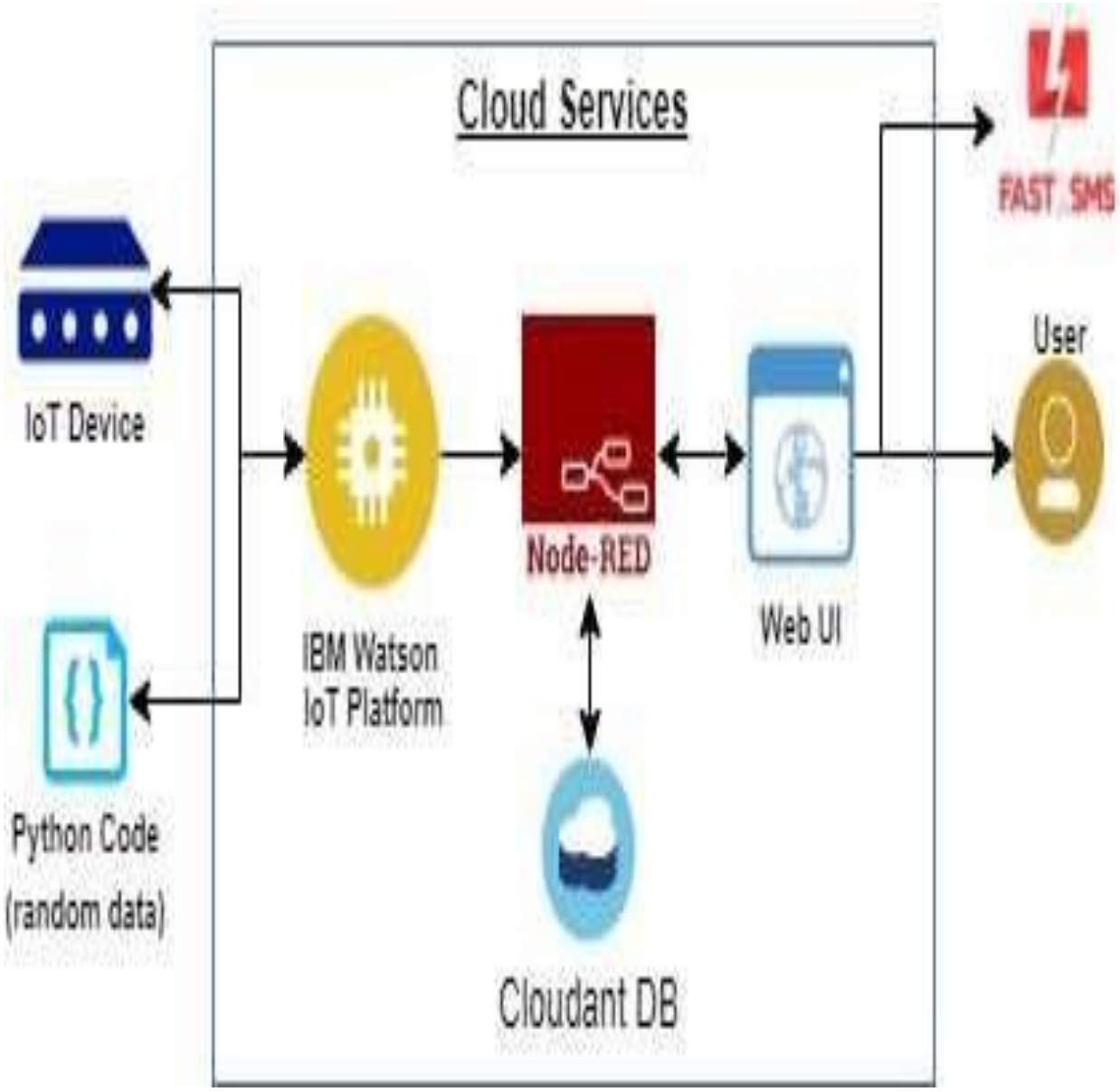
Water mist sprinkler systems use fine water droplets to extinguish fire, opposed to a heavier quantity of water used by regular sprinklers. They control fires in a number of ways, they can coordinate the flames and the surrounding gases by evaporation, as well as displacing the oxygen.

Solution Architecture Diagram:



TECHNICAL ARCHETECTURE:

Technology Architecture provides an overview of the various components of the system and how they work together. It is used for better decision making and understanding.



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

USER TYPE	FUNCTIONAL REQUIREMENT	USER STORY NUMBER	USER STORY/TASK	Acceptance criteria	Priority	Release
Developer	System building	USN-1	Collecting data from the sensor	I can collect data from sensor	High	Sprint-1
		USN-2	Implementing Arduino uno from data	I can Implementing the arduino	High	Sprint-2

		USN-3	Message alert to fire officials	I can receive the message	High	Sprint-1
		USN-4	Fire officials identify the problem and resolve it by using mobile application	I can try to solve the problem	High	Sprint-2
CUSTOMER (WEB USER)	Monitor	USN-1	The automatic nature of fire alarm monitoring means valuable time isn't lost between the start of the	I can monitor the industry	Medium	Sprint-1
			emergency and first responders arriving on the scene			
	Detection	USN-2	Detect the temperature, Smoke, flame, containment and extinguisher	I can detect the fire accident in the industry	High	Sprint-2

6. PROJECT PLANNING & SCHEDULING

6.1 SPRINT PLANNING & ESTIMATION

Product Backlog, Sprint Schedule, and Estimation

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Sensing	USN-1	Sensing the environment using the sensors.	3	High	Boomika Narmatha sabitha Srijeyaprakathi
	Operating	USN-2	Turning on the exhaust fan as well as the fire sprinkler system in cause of fire and gas leakage.	3	Medium	Boomika Narmatha sabitha Srijeyaprakathi

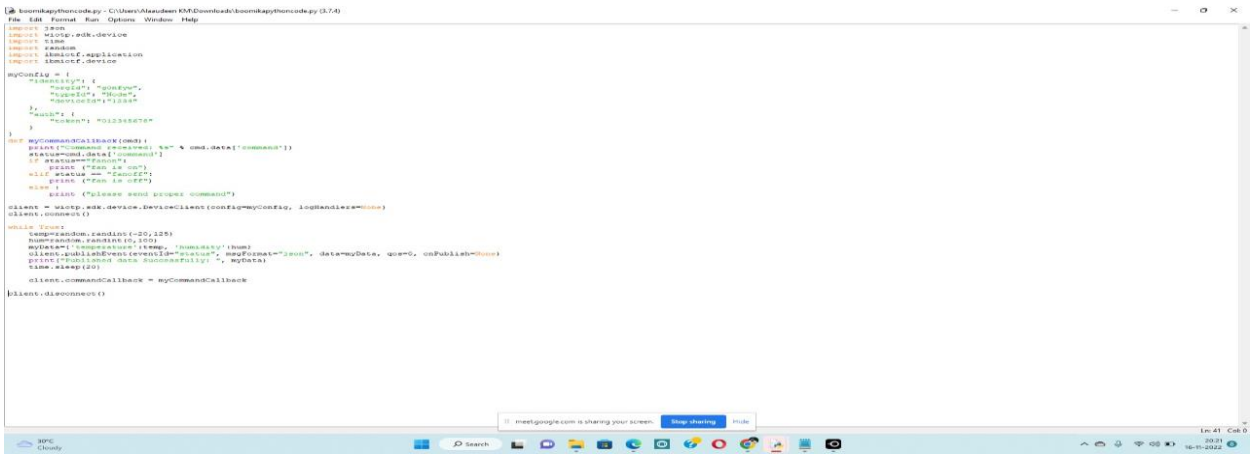
Sprint-2	Sending collected data to the IBM Watson platform	USN-3	Sending the data of the Sensors to the IBM Watson.	3	High	Boomika Narmatha sabitha Srijeyaprakathi

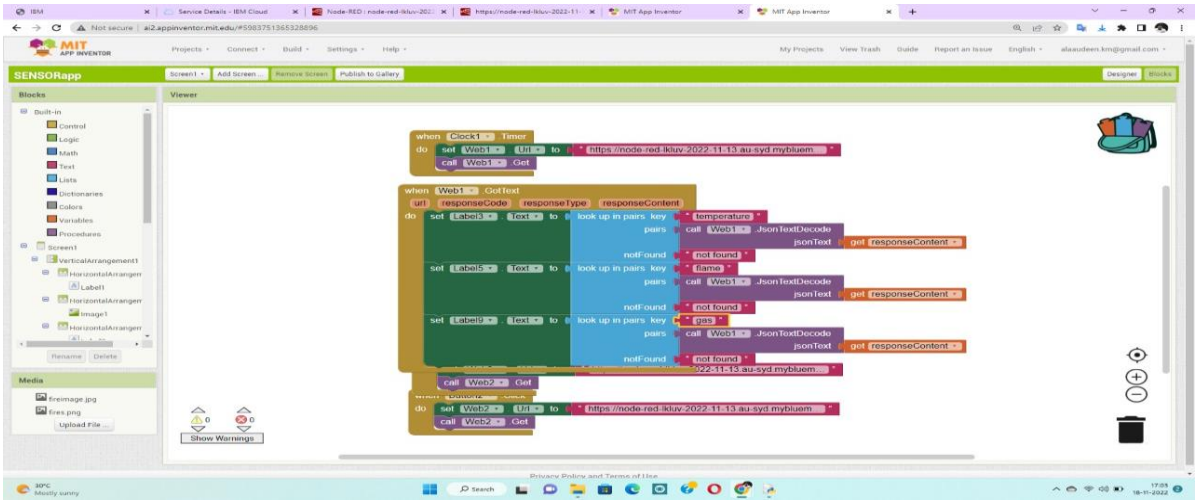
	Node red	USN-4	Sending the data from the IBM Watson to the Node red.	3	High	Boomika Narmatha sabitha Srijeyaprakathi
Sprint-3	Storing of sensor data	USN-5	Storing in Cloudant database.	2	Medium	Boomika Narmatha sabitha Srijeyaprakathi
	Registration	USN-6	Entering my email and password to verify authentication process.	1	Medium	Boomika Narmatha sabitha Srijeyaprakathi
	Web UI	USN-7	Monitors the situation of the environment which displays sensor information.	3	High	Boomika Narmatha sabitha Srijeyaprakathi

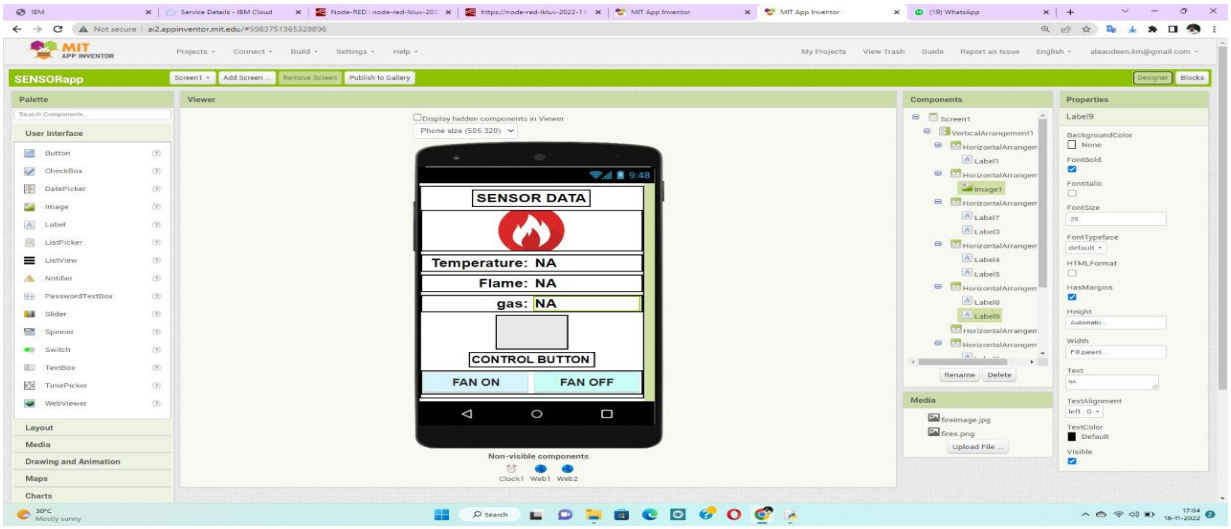
Sprint-4	Fast SMS Service	USN-8	Use Fast SMS to Send alert message once the parameters like temperature, flame and gas sensor readings goes beyond the threshold value.	3	High	Boomika Narmatha sabitha Srijeyaprakathi
	Turn ON/OFF the actuators	USN-9	User can turn off the Exhaust fan as well as the sprinkler system If need in that Situation.	2	Medium	Boomika Narmatha sabitha Srijeyaprakathi
	Testing	USN-10	Testing of project and Final Deliverables.	1	Low	Boomika Narmatha sabitha Srijeyaprakathi

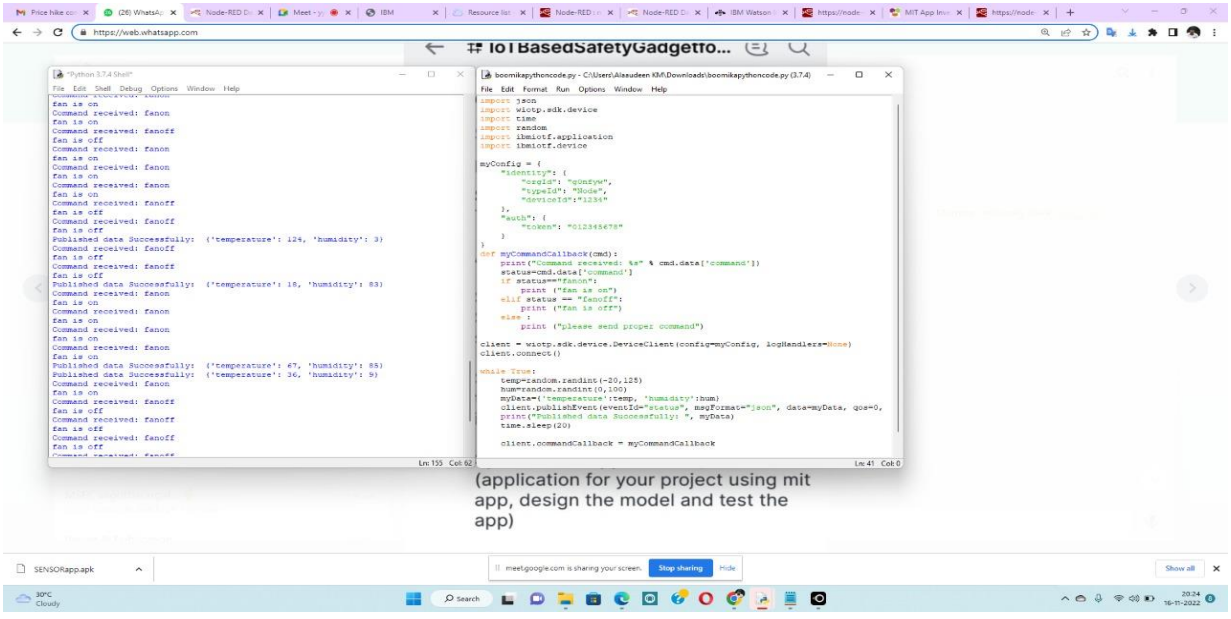
6.2 SPRINT DELIVERY SCHEDULE

SPRINT-1:

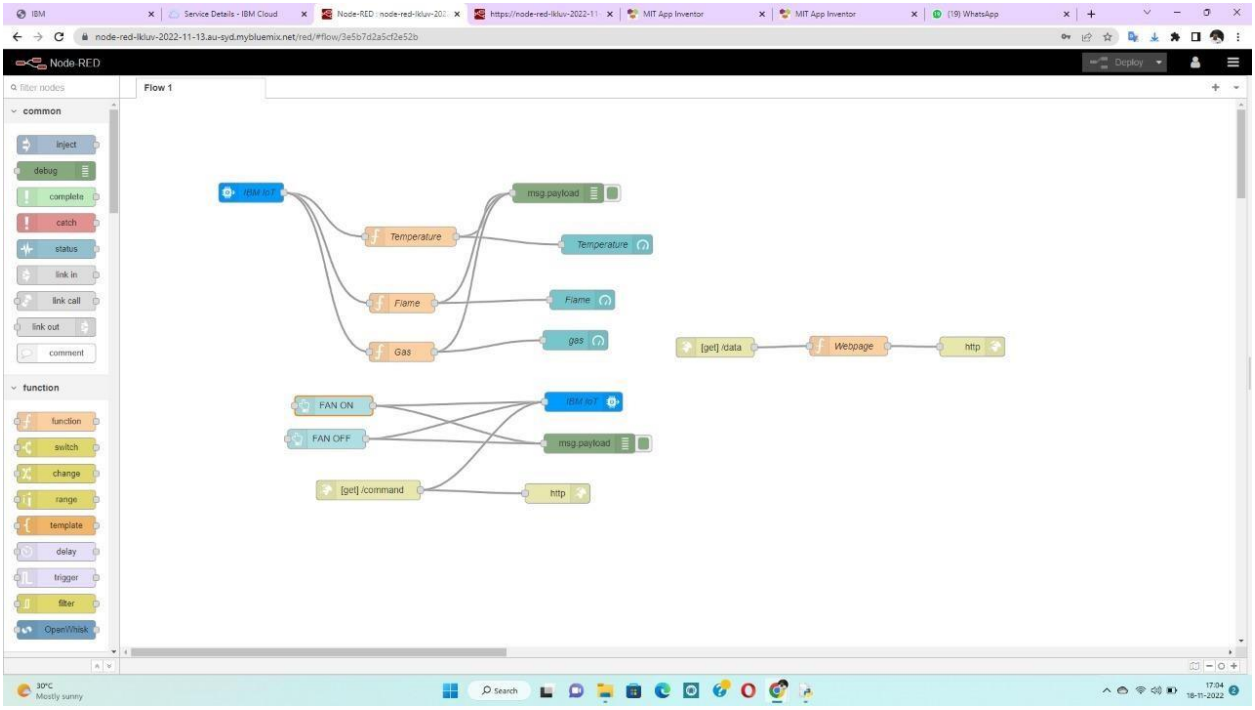

boomikapythoncode.py - C:\Users\Alaaudeen KM\Downloads\boomikapythoncode.py (3.7.4)
File Edit Format Run Options Window Help
import json
import wiotp.sdk.device
import time
import random
import ibmiotf.application
import ibmiotf.device
myConfig = {
"identity": {
"orgId": "gon4yw",
"typeId": "Node",
"deviceId":"1234"
},
"auth": {
"token": "0123456789"
}
}
def myCommandCallback(cmd):
print("Command received: %s" % cmd.data['command'])
status=cmd.data['command']
if status=="fanon":
print ("Fan is on")
elif status == "fanOff":
print ("Fan is off")
else :
print ("please send proper command")
client = wiotp.sdk.device.DeviceClient(config=myConfig, logHandlers=None)
client.connect()
while True:
temp=random.randint(-20,125)
hum=random.randint(0,100)
myData={'temperature':temp, 'humidity':hum}
client.publishEvent(eventId="status", msgFormat="json", data=myData, qos=0, onPublish=None)
print("Published data Successfully: ", myData)
time.sleep(20)
client.commandCallback = myCommandCallback
client.disconnect()
meetgoogle.com is sharing your screen.
Stop sharing
Hide

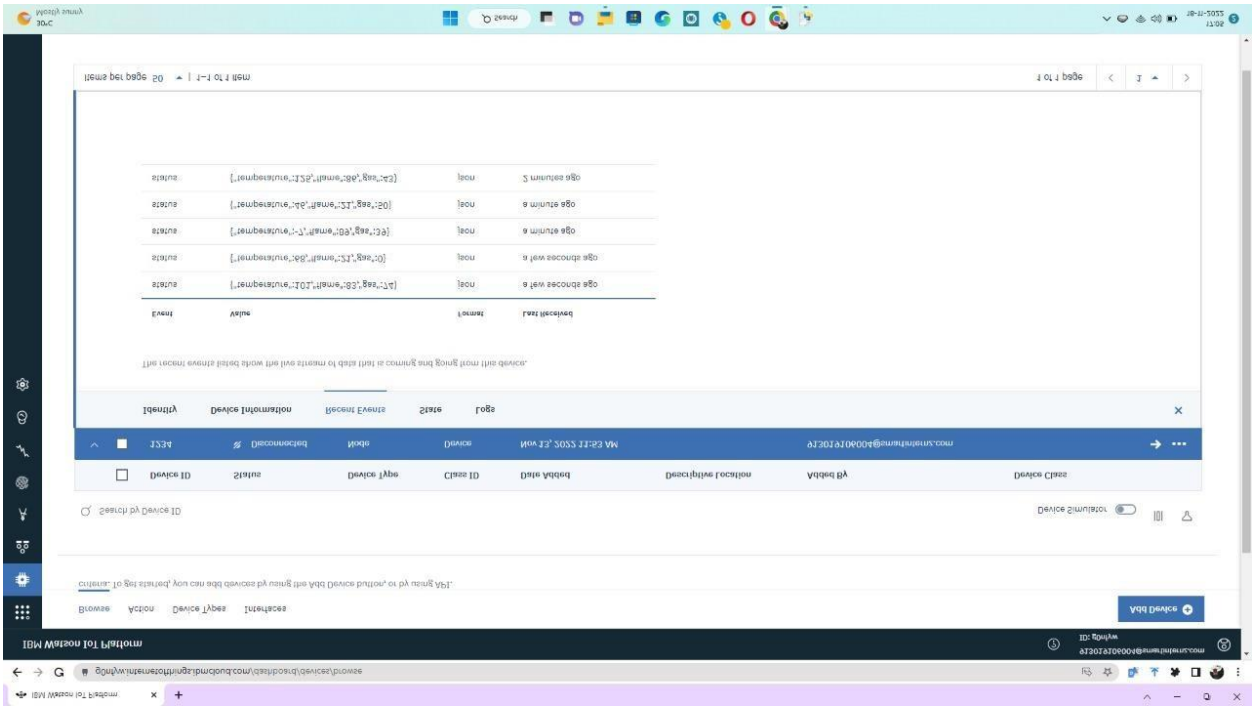

MIT APP INVENTOR
SENSORapp
Blocks
Viewer
Show Warnings
when Clock1 Timer
set Web1 Url to https://node-red-lkluv-2022-11-13.au-syd.mybluem
call Web1 Get
when Web1 GotText
url responseCode responseType responseContent
set Label3 Text to look up in pairs key temperature
set Label5 Text to look up in pairs key flame
set Label9 Text to look up in pairs key gas
pairs call Web1 JsonTextDecode
jsonText get responseContent
notFound not found
call Web2 Get
set Web2 Url to https://node-red-lkluv-2022-11-13.au-syd.mybluem


SENSORapp
SENSOR DATA
Temperature: NA
Flame: NA
gas: NA
CONTROL BUTTON
FAN ON
FAN OFF

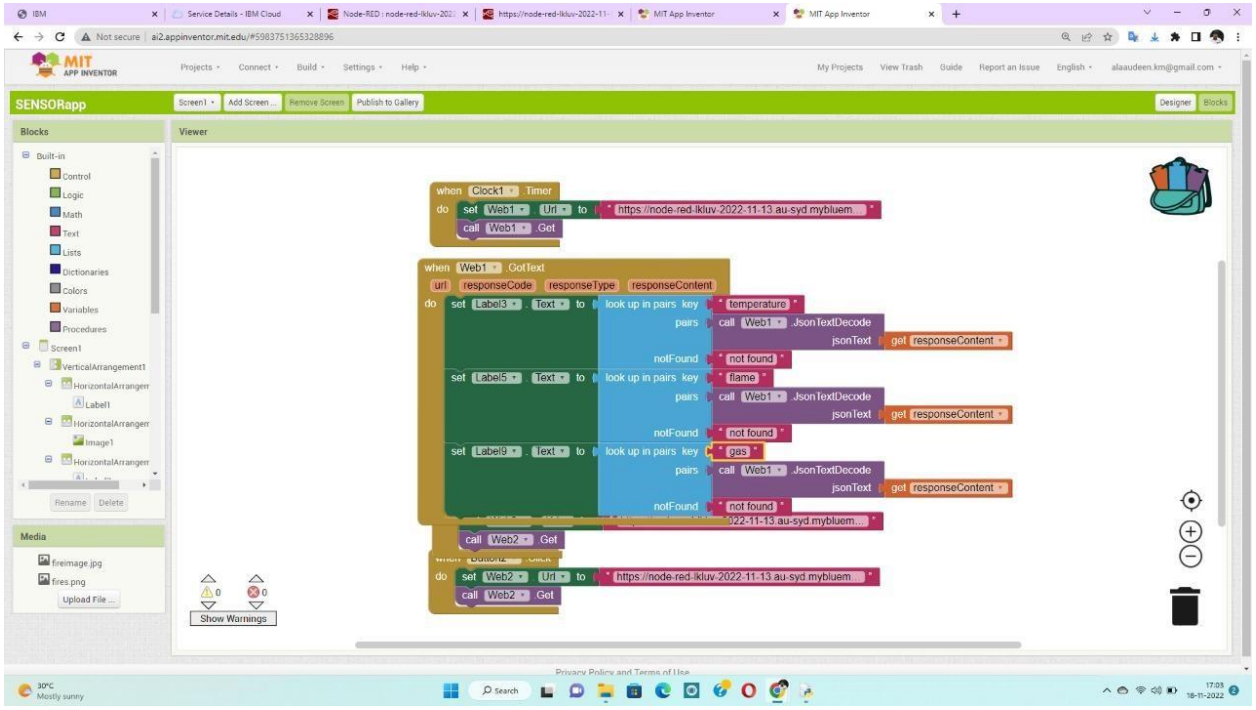

#IoTBasedSafetyGadgetfo...
(application for your project using mit app, design the model and test the app)

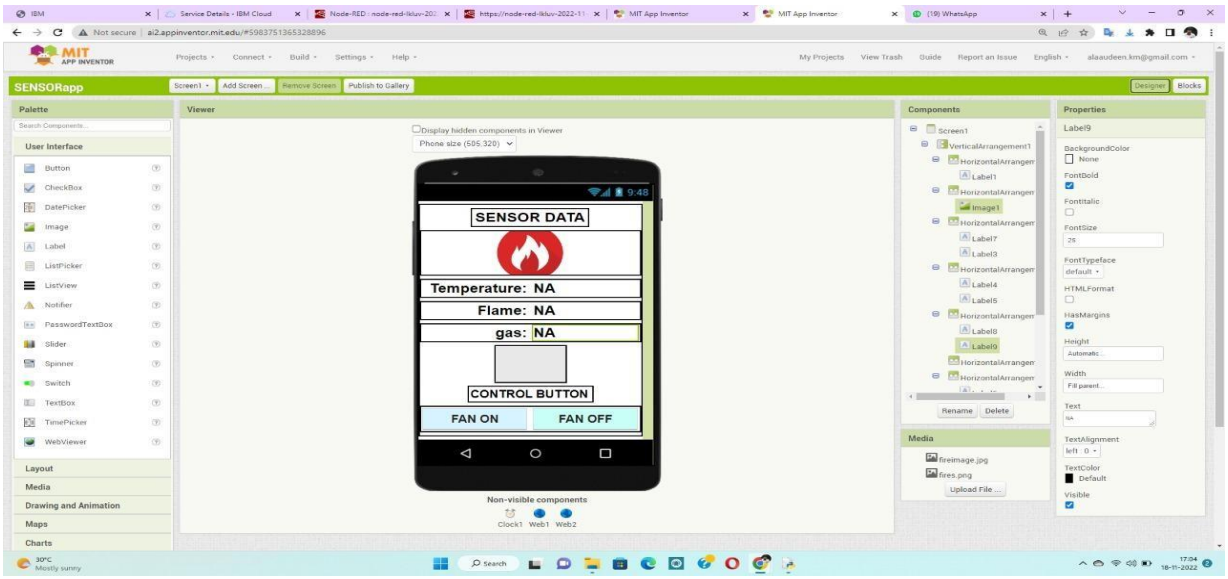
SPRINT-2:


Node-RED
Flow 1
common
inject
debug
complete
catch
status
link in
link call
link out
comment
function
function
switch
change
range
template
delay
trigger
filter
OpenWhisk
IBM IoT
Temperature
Flame
Gas
msg.payload
Temperature
Flame
gas
[get] /data
Webpage
http
FAN ON
FAN OFF
[get] /command
IBM IoT
msg.payload
http

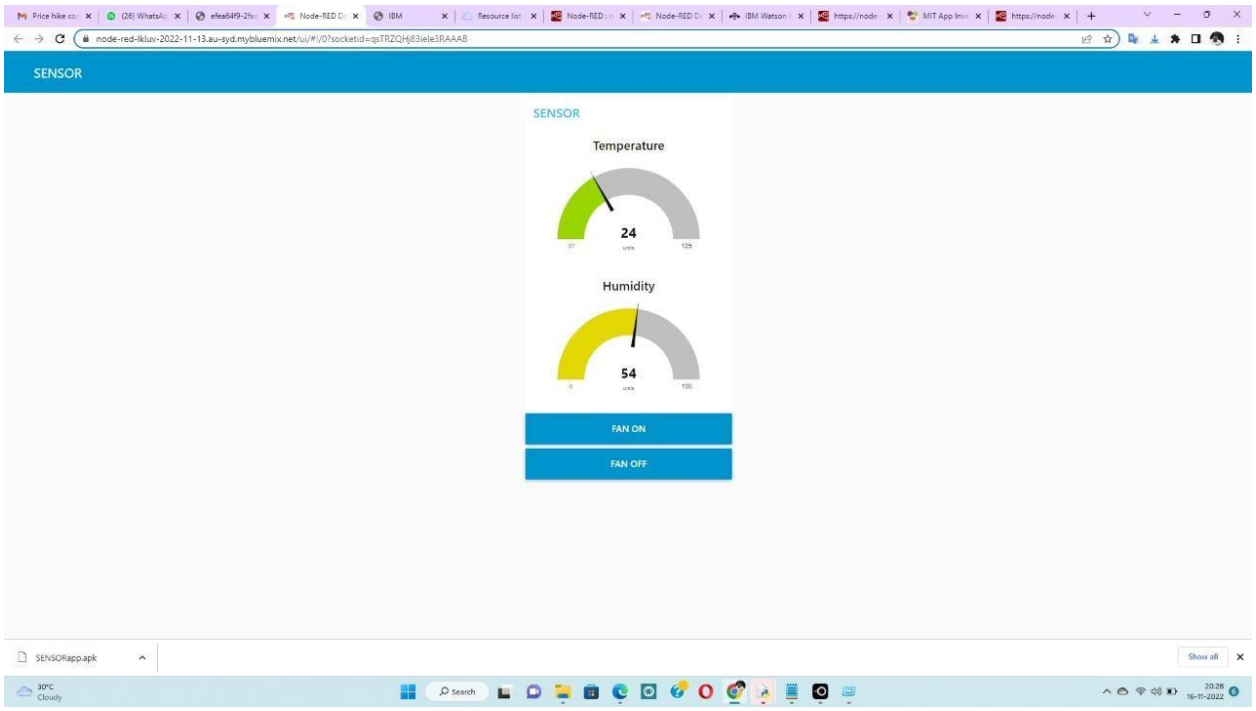


SPRINT-3:



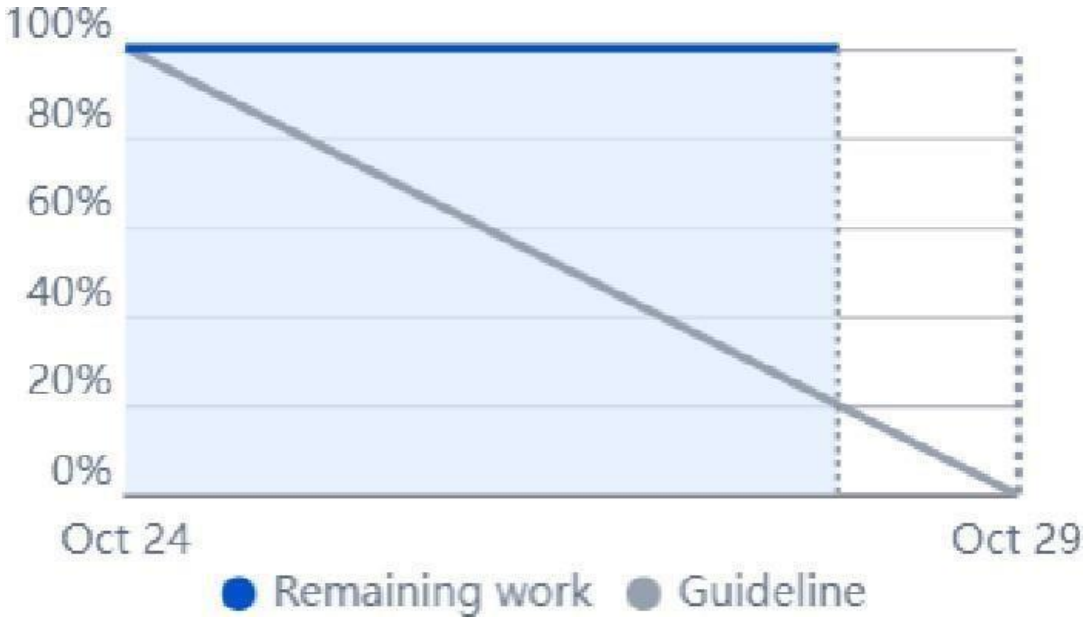


SPRINT-4:



6.3 REPORTS FROM JIRA

A burn down chart is a graphical representation of work left to do versus time. It is often used in agilesoftware development methodologies such as Scrum. However, burn down charts can be applied to any project containing measurable progress over time.



7.3 DATABASE SCHEMA

The database schema of the Iot based intelligent fire management system includes a table for storing information about fire incidents, a table for storing information about fire alarms, and a table for storing information about fire extinguishers.

7. CODING & SOLUTIONING

7.1 FEATURE 1

Fire management system provide a rapid means of notifying all building occupants of a fire emergency. These must be kept in operating condition at all times. Vandalism of these systems may result in injury of loss of life during an actual fire emergency.

7.2 FEATURE 2

Gas detectors alert you while there's still time to escape from a fire. learn their locations and be sensitive to avoidable activation(cooking, smoke, cigarette smoke, aerosols, steam etc.). don't hang things from them or cover them up.

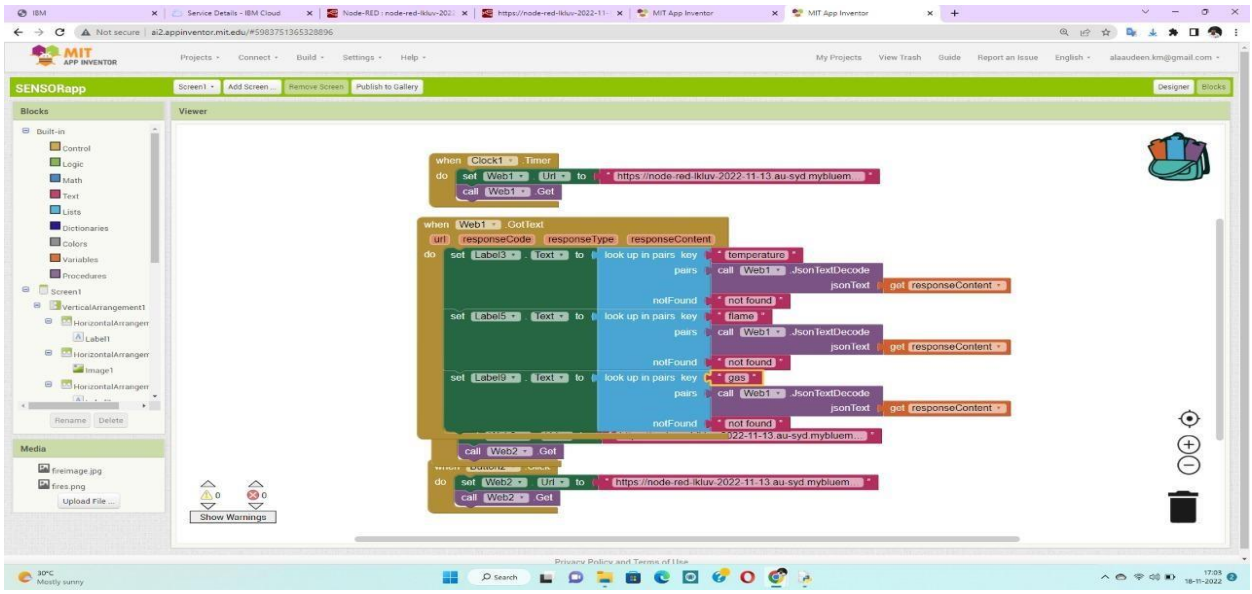
8. TESTING

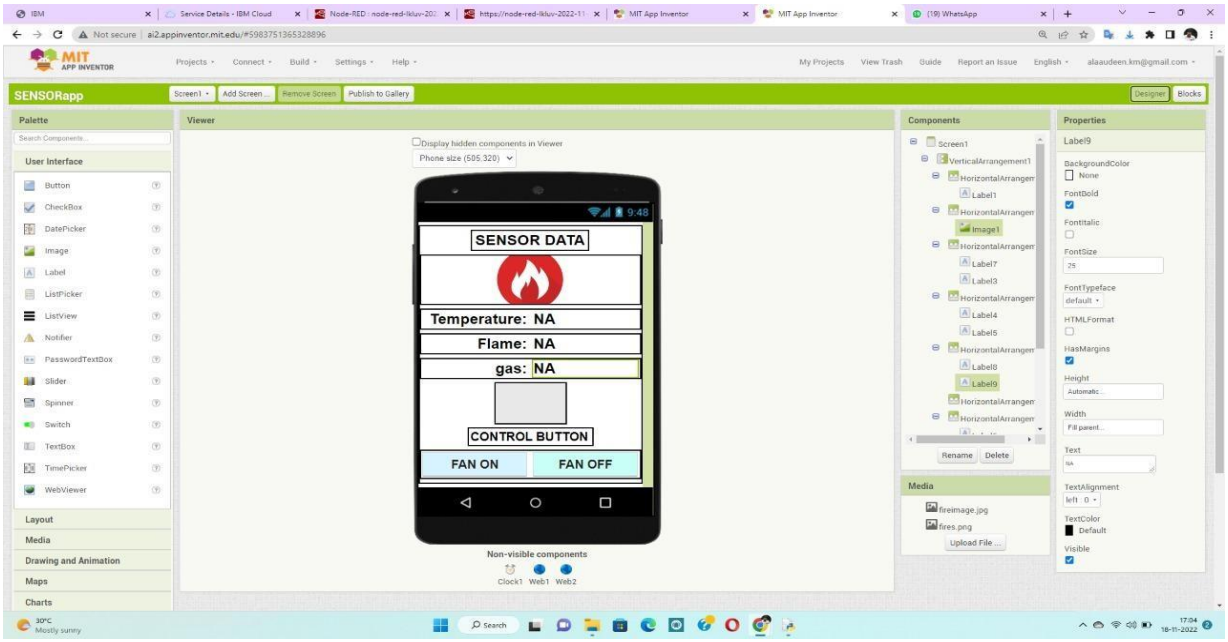
8.1 TEST CASES

- The system is able to automatically detect and extinguish fires in the vicinity.

- The system is able to automatically detect and report the presence of gas in the area.
- The system is able to automatically detect and report the presence of flames in the area.
- The system is able to automatically shut off all gas and electrical supplies in the event of a fire.
- The system is able to automatically notify the fire department in the event of a fire.
- The system is able to automatically notify the occupants of the building in the event of a fire.
- The system is able to automatically evacuate the building in the event of a fire.

8.2 USER ACCEPTANCE TESTING




SENSORapp
Screen1
Add Screen ...
Remove Screen
Publish to Gallery
Designer
Blocks
Palette
User Interface
Button
CheckBox
DatePicker
Image
Label
ListPicker
ListView
Notifier
PasswordTextBox
Slider
Spinner
Switch
TextBox
TimePicker
WebViewer
Layout
Media
Drawing and Animation
Maps
Charts
Viewer
Display hidden components in Viewer
Phone size (505, 320)
SENSOR DATA
Temperature: NA
Flame: NA
gas: NA
CONTROL BUTTON
FAN ON
FAN OFF
Non-visible components
Clock1
Web1
Web2
Components
Screen1
VerticalArrangement1
Label1
Image1
Label7
Label3
Label4
Label5
Label0
Label9
Rename
Delete
Media
fireimage.jpg
fires.png
Upload File ...
Properties
Label9
BackgroundColor
None
FontBold
FontItalic
FontSize
FontTypeface
default
HTMLFormat
HasMargins
Height
Automatic...
Width
Fill parent...
Text
TextAlignment
left : 0
TextColor
Default
Visible

9. RESULTS

9.1 PERFORMANCE METRICS

The amount of temperature and humidity is sensed by the sensor and the control action is taken automatically to turn off the fire generated.

10. ADVANTAGES :

- Highly compact and provide an authentical detection process.
- PIR sensor detect the exact location of origin of fire.
- Gas sensor detect the presence of any flammable gas.
- Temperature sensor detect the any unusual change in room temperature.
- Implementing relay nodes to ensure fault tolerance , that is increase connectivity. It is cheap and easy to install.

DISADVANTAGES:

- Implementation costs – An IoT-based Intelligent Fire Management System can be expensive to implement, especially if a large number of sensors are required.
- Maintenance costs – An IoT-based system can also be expensive to maintain, as sensors and other hardware will need to be regularly checked and replaced.

11. CONCLUSION

In this project an attempt has been made for making IOT based fire management system to identify fire accident and pass on the alert message to the authenticated user in the industry. By analyzing the literature review of various authors, this system is efficient to prevent from the fire

accidents in the industries and other hazardous places. The fire can be monitored in various places such as industries and offices. Prevention is better than cure, as the way by using the IOT based fire management system is suitable for detect the fire accident and save the human life.

12. FUTURE SCOPE

- The IoT based fire alarm system can be enhanced to sense leakage of LPG gas.
- IoT technologies can enhance the operational efficiency of the fire service
- The effectiveness of fire protection to improve fire fighter health and
- Safety and improve occupant safety
- Minimize injuries during a fire and minimize property loss
- Business interruptions due to fire.

13. APPENDIX

SOURCE CODE:

```
import json
import wiotp.sdk.device
import time
import random
import ibmiotf.application
import ibmiotf.device

myConfig = {
    "identity": {
        "orgId": "g0nfyw",
        "typeId": "Node",
        "deviceId":"1234"
    },
    "auth": {
        "token": "012345678"
    }
}
def myCommandCallback(cmd):
    print("Command received: %s" % cmd.data['command'])
    status=cmd.data['command']
    if status=="fanon":
        print ("fan is on")
    elif status == "fanoff":
```

```
        print ("fan is off")
    else :
        print ("please send proper command")

client = wiotp.sdk.device.DeviceClient(config=myConfig, logHandlers=None)
client.connect()

while True:
    temp=random.randint(-20,125)
    flame=random.randint(0,100)
    gas=random.randint(0,100)



    myData={'temperature':temp, 'flame':fla, 'gas':gas}
    client.publishEvent(eventId="status", msgFormat="json", data=myData, qos=0,
onPublish=None)
    print("Published data Successfully: ", myData)
    time.sleep(20)

    client.commandCallback = myCommandCallback

client.disconnect()
```

DEMO LINK:

https://youtu.be/_On7ML5E5ug