KONGUNADU COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

HX 8001-PROFESSIONAL READINESS FOR INNOVATION, EMPLOYABILITY AND ENTREPRENEURSHIP

HAZARDOUS AREA MONITORING FOR INDUSTRIAL POWER PLANT BY IoT

NALAIYA THIRAN PROJECT REPORT 2022

Submitted by

PRAVEENA S	**621319106069**
SNEKA T	**621319106090**
VARUNPRAKASH V	**621319106098**
VARUNRAJ K	**621319106317**

Team ID: PNT2022TMID13542

NOVEMBER 2022

TABLE OF CONTENTS

CHAPTER 1

1. INTRODUCTION

1.1 Project Overview

Since technological growth is a continuous process, we must be prepared and aware of any new advances. Because of these technological advancements, daily life has become more convenient. The necessity for automation has become essential. All systems and data are now accessible over the internet, and web technology is constantly developing. Using a web-based embedded system, a network interface provides remote management and control of embedded devices. Web control is used to manage Internet of Things (IoT) devices. The most popular technique of web development in the world uses a software stack called a web controller. For data monitoring, administration, and handlig, distributed nweb control systems made with web technologies are used instead of massive server systems.The industrial monitoring system connects itself with the open-source SMS for admin. IBM Iot platform connected to the Node Red for develop the web application .Then IBM Watson platform connected to the Python software.We have sent the random values for input as temperature.In software to check the temperature that person,SMS sent to admin using API KEY when the temperature value is

high compared to the threshold temperature value. API KEY also provides by the IBM Watson.SMS sent by Fast to SMS that is connected to the Node Red. Sometimes you are developed the app with help of MIT app inverter .

1.2 Purpose

The parallel-connected heat can also be included in this SMS system. The microcontroller serves as the brain of this SMS system, managing all activities.

The monitoring system used by the SMS system allows it to locate and identify the area that is on fire. Capable of showing the results from every sensor in the monitoring system.

In order to keep the temperature level and employees health issues, and SMS systems in safe, dependable, and effective operating condition, the systems must undergo inspection, testing, and maintenance.

With the use of temperature sensors, each employees health isuues that happens in the industry can be detected. To protect people for any health issues . To use a SMS alarm to warn people if an diseases occurs and to use IOT to do so.

CHAPTER 2

2. LITERATURE SURVEY

TITLE: IoT based temperature and humidity monitoring framework

AUTHOR: Rafizah Ab Rahman,Ummi Raba' ah Hashim,Sabrina Ahmad.

YEAR:2019

In order to understand the relationship and variation between temperature and humidity with respect to the various locations of measurements, this study investigated the use of Internet of Things (IoT) in monitoring the temperature and humidity of a data centre in real-time using a basic monitoring system. Utilizing the suggested architecture, a system for monitoring temperature and humidity was developed and put into use at the Politeknik Muadzam Shah data centre. There, readings were recorded and forwarded to an AT&T M2X IoT platform where they were stored. The information was then downloaded and analysed, revealing that the temperature and humidity recorded at various places varied significantly. X Extreme temperature and humidity variations were successfully detected by the monitoring system.

TITLE: Smart Weather Monitoring And Real Time Alert System Using IoT

AUTHOR: Yashaswi Rahut,Rimsha afreen, Divya Kamini

YEAR: 2018

The proposed system employs IoT to make its real-time data freely accessible over a very broad range and is an advanced solution for weather monitoring. The system uses a number of sensors to monitor many aspects of the weather and climate, including temperature, humidity, wind speed, wetness, light intensity, UV radiation, and even airborne carbon monoxide levels. The data from these sensors is transmitted to the website, where it is shown as graphical statistics. Anywhere in the world can readily access the data that has been uploaded to the website. These web pages' data collection can also be utilised as a future reference. The concept even includes an app that sends alerts as a reliable alarm system to inform users of sudden and unexpected.

TITLE: AIR POLLUTION MONITPORING SYSTEM WITH IOT

AUTHOR: Vivekanand Prakash Rachure, Dr.Vasudev, B.Virulkar

YEAR: 2019

- We are developing an IOT-based air pollution monitoring system in which we will monitor the air quality via a web page using a WI-Fi module and the internet. The system will sound an alarm when the air quality drops below a certain point, i.e., when enough dangerous gases, such as CO2, CO, smoke, CH4, and benzene, are present in the air. It will display the air quality in PPM and in the percentage on the LCD and as well as on the webpage in PPM so that we can easily monitor it and make a graphical presentation on the webpage.

TITLE:Air and Sound Pollution Monitoring System Using IOT

AUTHOR: Ms.Aarthi,etal.

YEAR:2018

One of the significant problems today is the rising air and sound pollution. As pollution worsens, more diseases are emerging as a result. Controlling pollution is now necessary in order to ensure healthy living and a brighter future. Everyone who is interested in the pollution level can access the Air and Sound Pollution Monitoring gadget. A mobile application that displays the pollution level can be used to install the device. This device has the ability to detect fires in the surrounding area and report them to the appropriate authorities so that they can take the appropriate action and contain the fire to minimise damage. This system employs an IOT, or Internet of Things, technique.

TITLE:IoT based Environmental Monitoring and Control System

AUTHOR: Ghulam Rubab Mirza,Etal.

YEAR:2019

Due to climatic changes that increased the importance of environmental monitoring, IoT plays a significant role in gathering data from the sensing unit around our surroundings. Using the Node MCU, DHT11 sensor, ACS712 current sensor, Thing Speak (Open IoT analytics service), and Blynk application, this paper describes the building of a real-time environmental monitoring and control system. Thing Speak's primary responsibility is to continuously monitor parameters (such as humidity, temperature, and power consumption) using real-time sensors. Thing Speak has an API (application programming interface) that collects sensed data and allows users to view the monitored data in graphs at intervals of every 15 seconds.This technology is also intended to allow users to control home appliances from anywhere in the world.

TITLE: Study and Development of Temperature & Humidity monitoring system through Wireless Sensor Network (WSN) using Zigbee module.

AUTHOR:Hemalata Tomer,Kapil Mangla.

YEAR:2015.

Given that they are now frequently utilised as the main monitoring system in a variety of applications, wireless sensor networks have become a crucial component of every developing nation. The risks associated with wiring systems are eliminated by wireless sensor networks, which also significantly simplify and reduce the cost of data monitoring and measurement. Wireless networks are best suited for various process plants, industries, and remote & rural communication due to its decentralised architecture and flexibility of deployment. In this study, wireless sensor

network applications are made for online measurement and monitoring of reaction chambers, furnaces, and other industrial measurement targets.

TITLE: Weather Monitoring Station: A Review

AUTHOR: Mr.DipakV.Sose,Dr.Ajij,D.Sayyad,

YEAR: 2018

Since weather monitoring is crucial to human life, it is important to research the weather system.There are now two different types of weather monitoring stations: wired and wireless. The popularity of wireless systems nowadays is due to their benefits over wired ones. In weather monitoring, the characteristics typically include temperature, humidity, air pressure, light intensity, rainfall, etc. There are numerous ways that have been used with various processors, including PIC, AVR, and ARM. The analogue output of the sensors is fetched using an analogue to digital channel. The GSM, FM channel, Zigbee, RF, and other wireless technologies used in weather monitoring have their own protocols.

TITLE:IOT BASED INDUSTRIAL MONITORING SYSTEM

AUTHOR: Hemlata Yadav, Etal,

YEAR: 2022

A new industry called the Internet of Things (IoT) seeks to connect "things," "people," and "machines" to the internet. IoT-based industrial monitoring solutions are at the forefront of the global modernization and automation that is taking place. To ensure that the products are safe and effective, it is critical to evaluate the state of the sector. An IoT-based industrial monitoring system with intelligent sensors is what this study aims

to build.Big data integration allows the Blynk app to be utilised from anywhere on the earth to check on status. IoT monitoring is now simpler thanks to streamlined data analysis. The manufacturing industry might benefit from the proposed technology. Any industrial industry that incorporates technology will guarantee workers' security and welfare.

TITLE: Real-time monitoring system for weather and air pollutant measurement with HTML-based UI application.

AUTHOR:Prisma Megantoro,BrahmantyAji Pramudita,Vigneshwaran Pandi

YEAR:2021

In this post, it is discussed how to create an HTML web-based application and an IoT system to track meteorological variables and airborne gas pollution. The following weather variables are measured: wind direction and speed, precipitation, air temperature and humidity, barometric pressure, and UV index. On the other hand, ammonia, hydrogen, methane, ozone, carbon monoxide, and carbon dioxide were all measured. In this article, a method for sending full parameter data is introduced. Each sensor's read parameters are all converted to strings, then all of the strings from all of the sensors are combined into a string dataset, which is periodically sent to the server. The dataset that was obtained from the server is parsed for processing on the UI side before being presented. Google Firebase serves as the real-time database server for this system.

2.1 Existing Problem

Two curation systems make up the suggested system. The first is curation that is based on machines, and the second is curation that is based on users. These curative systems are set up to offer an intelligent and uncontrollable feedback to the existing environment. The latter requires the user to actively manage the reaction that the hardware provides, whereas the former is more of a predictive system designed on hardware. The curation done by the device is referred to as "Direct Machine Based Curation" and is based on the sensor data it gets from its end points (sensory hardware units). Additionally, the gadget and cloud server offer a hybrid machine-based curation service that uses Weather Forecast data along with sensor data from it.

2.2 Reference

1. Zhao Hongzhuang, Li Weidong, Zhou Pinggen, et al. For geological disaster monitoring and early warning of intelligent multimedia sensor network, Science and Technology Consulting Herald, 2012(2):29~30.

2. Lin Liangjun, Fang Cheng, Li Xiaojie, et al. Preliminary analysis of the Wenchuan earthquake disaster area geological disaster, Hydrogeology and Engineering Geology, 2008,35(4):129~132.

3. WANG Xin, LIU Xiaoying, QI Shi, LAN Jingtao, LIU Dan. Monitoring and Prediction of Landslide and Debris Flow in Japan, Journal of Anhui Agri Sci, 2009, 37(14): 6503-6505.

4. ZHANG Yan. Current investigation and control countermeasure of landslides in Japan--The investigation report about geological hazard

monitoring and controlling technique of Japan, The Chinese Journal of Geological Hazard and Control, 2007, 12 (18): 1-4.

5. CUI Zhongxin. Development of a Field Automatic Measuring System For Landslide—An Brief Introduction on a Field Automatic Measuring System For Landslides Had Created by Hisashi TSUCHIYA and others, Bulletion of Soil and Water Conservation, 1994,14(5): 1- 7.

6. U.S. Geological Survey. Landslide Hazards Program 5-Year Plan 2006-2010, 2005. http://landslides.usgs.gov

7. ZHE Lun. Landslide Hazards Program of the U.S. Geological Survey, Resources and living environment, 2009,(17)·42-46.

8. WANG Zhuoni. Enlightenment and progress of the USGS landslide research and service, Advances in Meteorological Science and Technology, 2013,3 (suppl):62-69.

9. Liu Chuanzheng, Yang Bing. A new thought of surveying, evaluating, monitoring and forecasting for the geologic hazards in the threegorges on changjiang river, Journal of Engineering Geology, 2001, 9(2) 121~126

10. Atzori L, Iera A, Morabito G. The Internet of Things: A survey, Computer Networks, 2010(15):2787-2805.

11. Domingo MC. An overview of the Internet of Things for people with disabilities, Journal of Network and Computer Applications, 2012(2): 584-596.

12. Kortuem G, Kawsar F, Fitton D et al. Smart objects as building blocks for the Internet of Things, Internet Computing, IEEE 2010(1):44~51.

13. Hong-hui Wang, Xian-guo Tuo, Gui-yu Zhang, Feng-ling Peng. Panzhihua airport landslide (Oct. 3rd 2009) and an emergency monitoring

and warning system based on the internet of things, Journal of Mountain Science, 2013,10(05): 873~884.

14. Sun Enji, Zhang Xingkai, Li Zhongxue. The Internet of Things (IoT) and cloud computing (CC) based tailings dam monitoring and prealarm system in mines, Safety Science, 2012(4):811~815.

15. Zhu Yonghui, Bai Zhengdong, Guo Jingjun, et al. A new wireless system for geological disasters monitoring based on Beidou, Bulletin of Surveying and Mapping, 2010(2):5~7.

2.3 Problem Statement

Through this, we can monitor the temperature parameters of the hazardous areas in industrial plants.The area is integrated with smart beacon devices which will be broadcasting the temperature of that particular area.Every person working in those areas will be given smart wearable devices which will be acting as beacon scanners.Whenever the person goes near the beacon scanners he can view the temperature on his wearable device and if the temperature is high, he will receive the alerts to the mobile through SMS using API.Sending random Humidity and Temperature values will be sent to the IBM IoT platform.Sensors values can be viewed in the Web Application.Notifies the admin the random values cross the threshold valueThrough this wearable device, the data is sent to the cloud and through the dashboard, the admins of that particular plant can view the data and take necessary precautions if required.

Reference Link: https://miro.com/app/board/uXjVPPiSvZg=/

Problem Statement (PS)	I am	I'm trying to	But	Because,	Which makes me feel
PS-1	Fire accident detector	Detect fire accidents	Small amount of sparkle also leads to become fire accident	They are flammable and act as high source of ignition	It affect materials and endanger to humans if in case of rapid fire accident occurred
PS-2	Fire accident detector	To hire careful/experience employees in industry	Careless mistakes will affect whole industry	They are flammable and act as high source of ignition	If we done a work with careless method, it affect whole industry and their surrondings

CHAPTER 3

3. IDEATION & PROPOSED SYSTEM

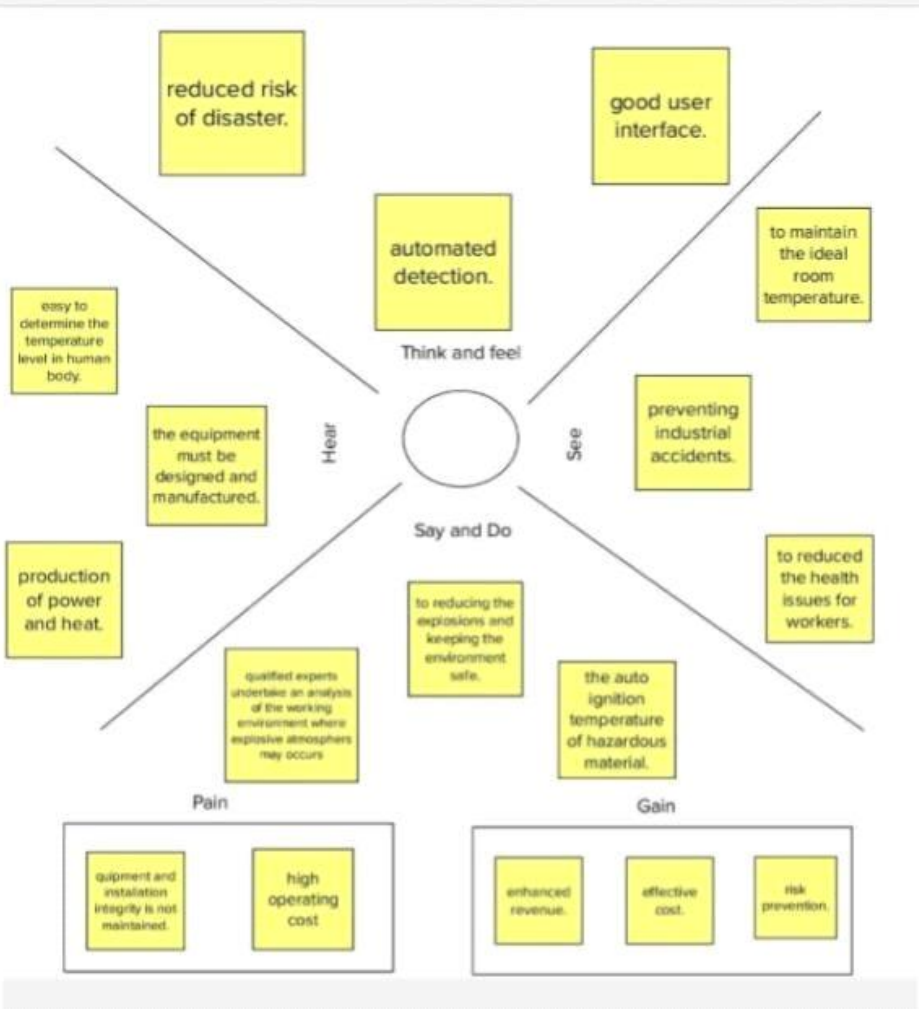
3.1 Empathy Map Canvas

An empathy map is a straightforward, simple-to-understand picture that summarises information about a user's actions and views. It is a helpful tool that enables teams to comprehend their users more fully. It's important to comprehend both the actual issue and the person who is experiencing it in order to develop a workable solution. Participants learn to

think about situations from the user's perspective, including goals and challenges, through the exercise of creating the map.

ReferenceLink:

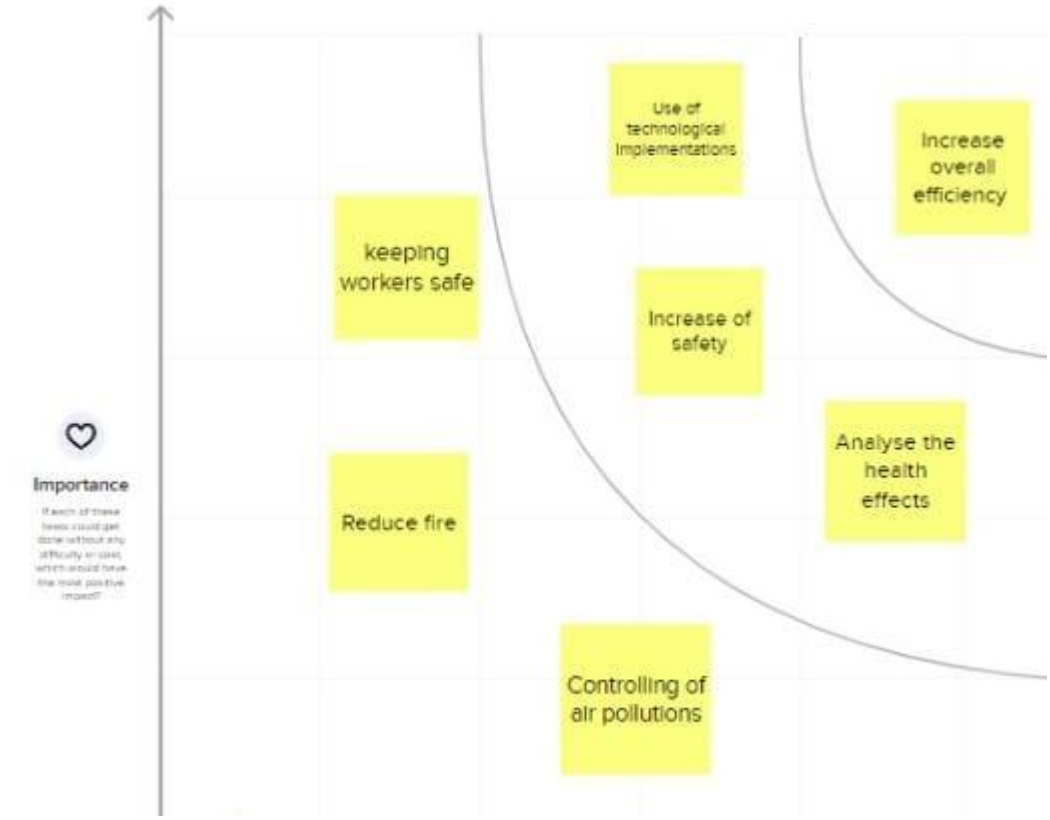
https://app.mural.co/t/psvv4056/m/psvv4056/1663738386818/1798484974df2cd87c35771c529f6c95616b0097?sender=u0b18d7eb1193b023227c5965



3.2 Ideation & Brainstorming:

ReferenceLink:

https://app.mural.co/t/psvv4056/m/psvv4056/1665129749840/ce975c4373efd7220ac521a3576abe7e8706368d?sender=u0b18d7eb1193b023227c5965



team leader
PRAVEENA S

Increase overall efficiency

To reduce maintenance cost

Reduce the amount of water source for convertion

Reduce the usage of fossile fuels

Team member 1
SNEKA T

Use of technological implementations

Use of cybersecurity

Analyse the health effects

Increase of safety

Team member 2

VARUN PRAKASH V

increasing environmental regulations

Reduce the chance of electric shocks

Reduce fire

keeping workers safe

Team Member 3

VARUN RAJ K

Reduce explosions

Growth and survival of vegetation

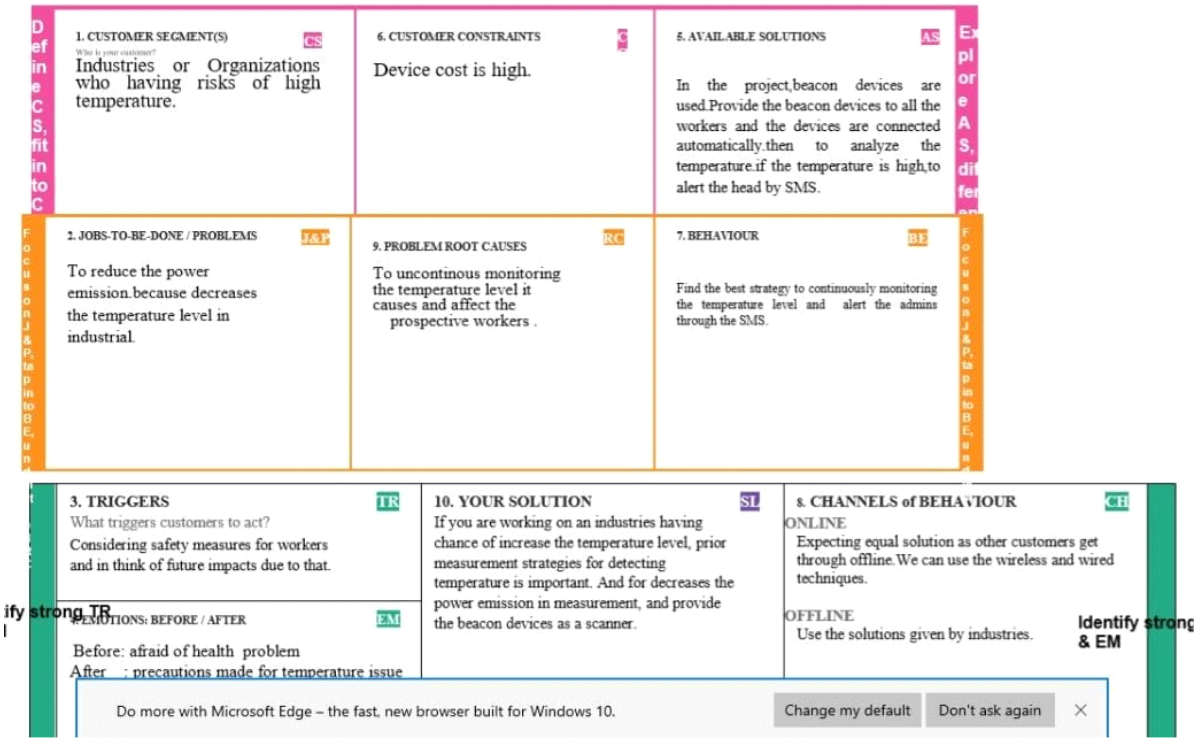
Reduce the contact of hazardous chemicals

Controlling of air pollutions

3.3 Proposed Solution:

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Most of the workers are worked in the industrial power plant ,on there most of the power are emitted from the power plant ,so the temperature will be increased that increase in temperature will affects the human health . To rectify these kind of problems the project is made.
2.	Idea / Solution description	Every persons is working in those areas will be given smart wearable devices which will be actings as beacon scanners.Whenever the person goes near beacon scanners he can view the temperature on his wearable device and if temperature is high,he will receive the alerts to the mobile through SMS using API.Through this wearable device,the data is sent to the cloud and through the dashboard,the admins of that particular plant can view the data and take necessary precautions if required.
3.	Novelty / Uniqueness	In novelty of the project,we can use the beacon devices which to sense the temperature.
4.	Social Impact / Customer Satisfaction	Low cost. Easy to operate. Reliability.
5.	Business Model (Revenue Model)	Sales revenues and maintanance. Periodically report and periodically meeting. It has the industrial areas.
6.	Scalability of the Solution	It is long reliability. It uses the long period of time.

3.4 Problem Solution Fit:



CHAPTER 4

4. REQUIREMENT ANALYSIS

4.1 Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Communicate and exchange information to provide server for user	To monitor the temperature parameter of theHazardous area in industrial plants. Alert the person working in those areas and admins ofthat particular plant through SMS using API.
FR-2	Live asset monitoring	Set the reference Temperature Detect the temperature and the particular location. Warning when the temperature raise to set temperature.
FR-3	User requirement	Easily integrate with the current solution It eliminates the time consuming process and workers requirement. Improve efficiency.
FR-4	Mandatory	Keep safe from unexpected injuries. The reduction of human risk. Spotting disastrous earlier and taking precautions. The required information exist for a long time.
FR-5	Testing Reference Temperature(T1) Crossed the Reference Temperature	The test case status is pass if When the current temperatures equal to reference temperature(T1). Once the temperature cross the warning SMS will be sent to the workers and admins of the plant.

4.2 Non-Functional Requirements:

Non-functional Requirements:

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

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	High usability of user experience design for user, which is to solve the problem efficiently.
NFR-2	**Security**	The system can accessed by authorized person only.
NFR-3	**Reliability**	Monitoring the temperature parameter and providing clear solution for it, by accurate real time data collection.
NFR-4	**Performance**	The Performance should be very effective and efficient.
NFR-5	**Availability**	The existing system affects the workers due to a minute error may lead to great loss and the company may face the catastrophic failure.
NFR-6	**Scalability**	Website traffic limit must be scalable enough to support users at a time. The system should have upgradable feature.

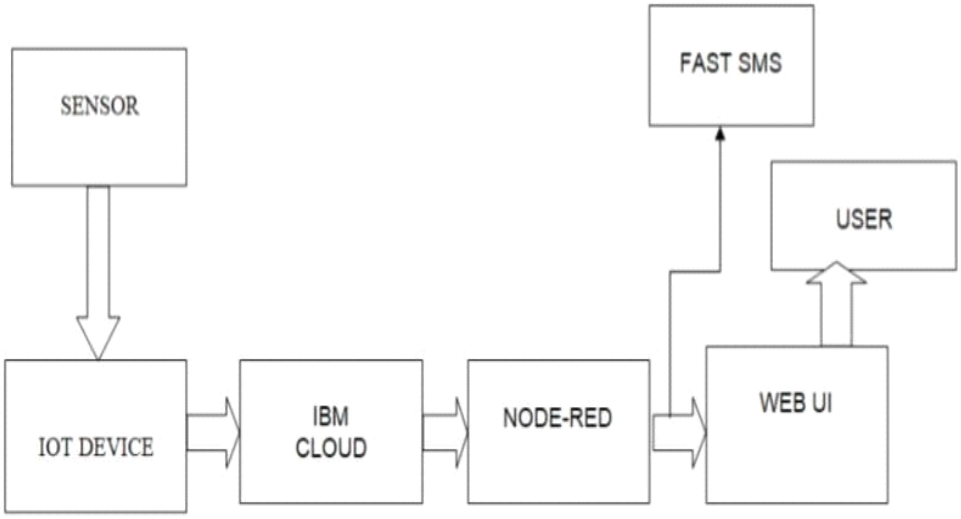
CHAPTER 5

5.1 Data Flow Diagrams:

An information flow diagram can depict how data moves throughout a process. This covers data input/output, data storage, and the numerous data-moving supporting operations. Standardized symbols and notations are used to generate DFDs in order to characterise diverse entities and their relationships.

Data Flow Diagrams:

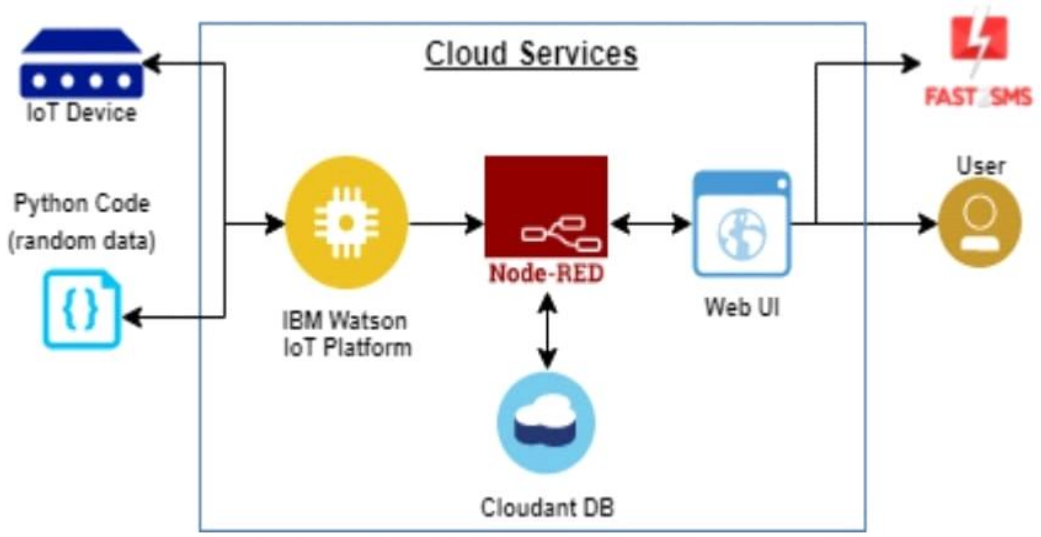
A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.



5.2 Solution & Technical Architecture:

For communication and analysis, IBM Cloud offers visualisations, exploration, dashboard reports, and tales. A view that includes visualisations, such as a graph, chart, plot, table, map, or any other type of visual

representation of data, can be put together. A dashboard provides critical insights and information about your data on one or more pages or screens, allowing you to keep track of events or actions at a glance.



5.3 User Stories:

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Industrial Owner)	Registration	USN-1	As an Industrial Owner, I can register into the application by entering email & password	I can access my account / dashboard	High	Sprint-1
	Data Modules	USN-2	As an Industrial Owner, I can get message about the temperature and humidity	I can receive confirmation email & click confirm	High	Sprint-1
	Login	USN-3	As an industrial Owner, I can login into my account through email and Password	I can access my account	Medium	Sprint-2
	Dashboard	USN-4	As an Industrial Owner, I can monitor of temperature	I can access the dashboard with individual Login id/password	High	Sprint-1
Customer (Industrial Worker)	Registration	USN-1	As an Industrial Worker, I can register into the application by entering email & password	I can access my account / dashboard	High	Sprint-1
	Data Modules	USN-2	As an Industrial Worker, I can get message about the temperature and humidity	I can receive confirmation email & click confirm	High	Sprint-1
	Login	USN-3	As an industrial Owner, I can login into my account through email and Password	I can access my account	Medium	Sprint-2
	Dashboard	USN-4	As an Industrial Owner, I can get alert high temperature	I can access the dashboard with individual Login	High	Sprint-1

CHAPTER 6

6. PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation:

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Installation of Beacons(External)	USN-1	The technician should install the smart beacon devices at vital points to increase the data sensing range	1	High	Praveena s
Sprint-2	Cloud Setup (Cloud Sevices)	USN-2	The smart beacons are connect with IBM cloud services for real-time data transfer	3	High	Sneka t
Sprint-3	Admin Dasboard Setup/ Web UI (Cloud Services)	USN-3	The web UI is developed and deployed for connecting the user to the cloud	3	High	Varunprakash v
Sprint-4	Mobile and wearable device setup (Users)	USN-4	Mobile applications are created using fast SMS API to send alert SMS message and also the watch display mechanism is developed	5	High	Varunraj k

6.2 Sprint Delivery Schedule:

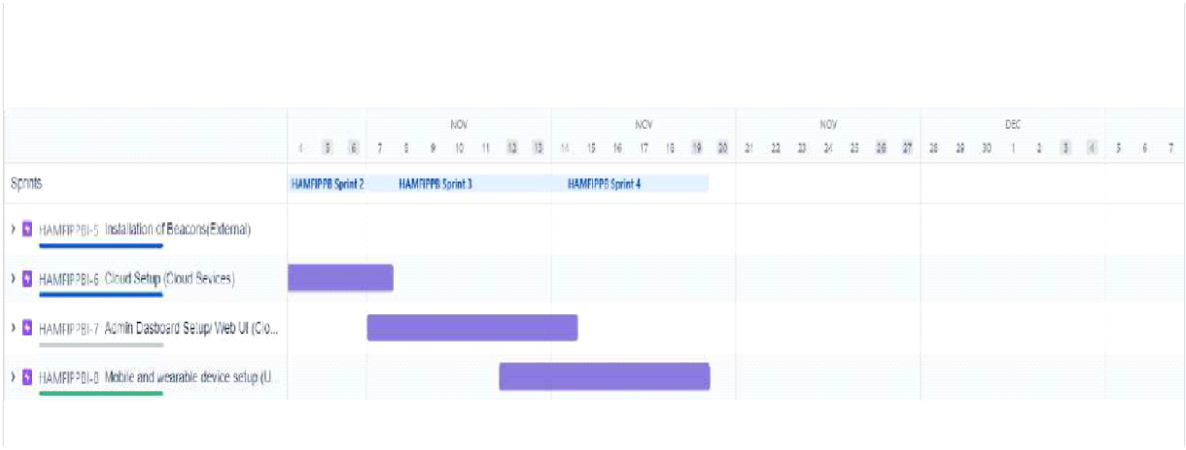
S.No.	Activity Title	Activity Description	Duration
1.	Understanding the project	Assign the team members after that create repository in the GitHub and then assign task to each member and guide them how to access the GitHub while submitting the assignments.	1 week
2.	Starting the project	Assign all the tasks based on sprints and work on it accordingly.	1 week
3.	Completing every tasks	Team Leader should ensure that whether revery team member have completed the assigned tasks or not.	1 week
4.	Stand-Up Meetings	Team Leader must have a Stand-Up Meeting with the Team and Work on the Updates and Requirement Session.	1 week
5.	Deadline	Ensure that team members are completing every task within the deadline.	1 week
6.	Budget and Scope of the project	Analyze the overallbudget which must be within certain limit. It should be favorable to every person.	1 week

6.3 Reports From JIIRA :

Jira brings teams together for everything from agile software development and customer service to start-ups and companies. Jira assists teams in planning, assigning, tracking, reporting, and managing work.

Reference Link:

https://pnt2022tmid13542.atlassian.net/jira/software/projects/HAMFIPPBI/boards/1/backlog



CHAPTER 7

7. CODING & SOLUTIONING

7.1 Feature 1:

To share your insights and analysis, IBM Cloud offers dashboards and stories. A view that includes visualisations, such as a graph, chart, plot, table, map, or any other type of visual representation of data, can be put together.

7.2 Feature 2:

Discover trends and correlations that have an impact on your business by exploring sophisticated visualisations of your data in the IBM cloud. By presenting critical insights and analyses about your data on one or more pages or screens, a dashboard enables you to keep track of events or actions at a glance.

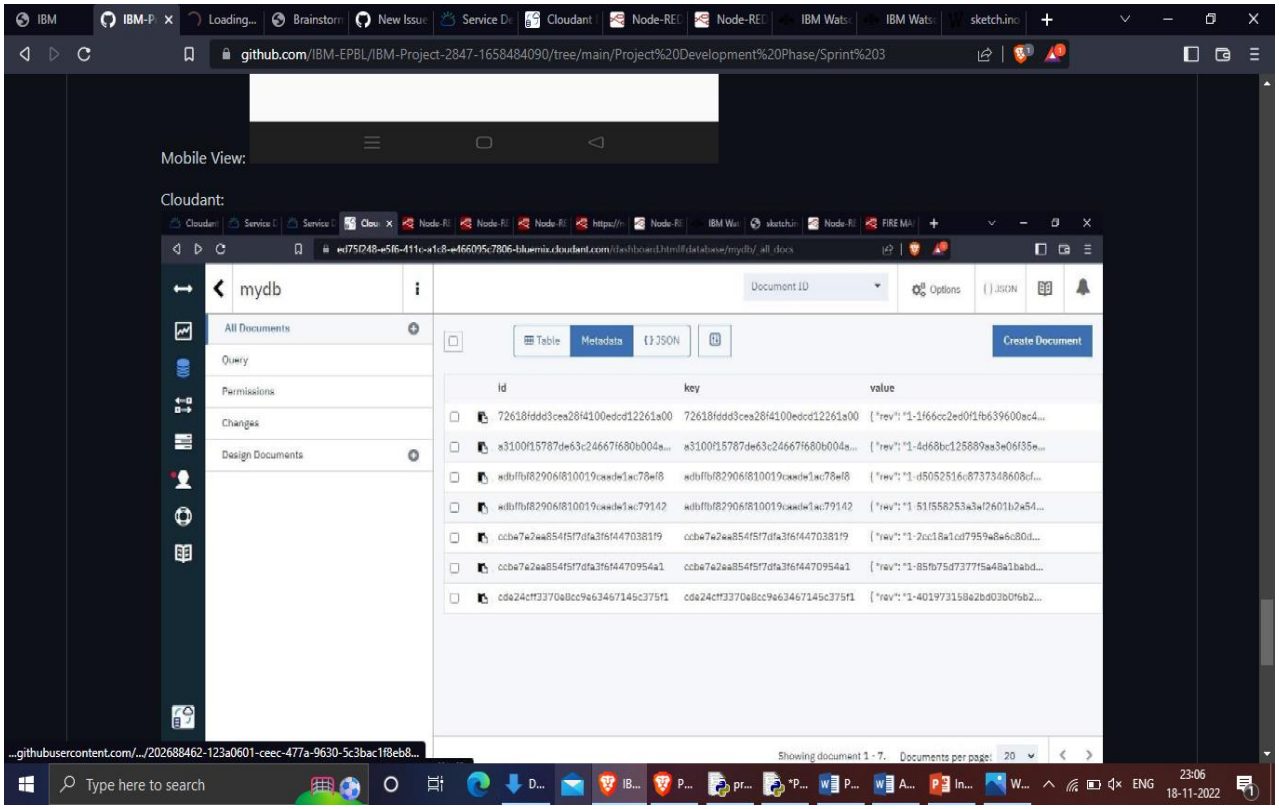
The modules in our work are as follows:

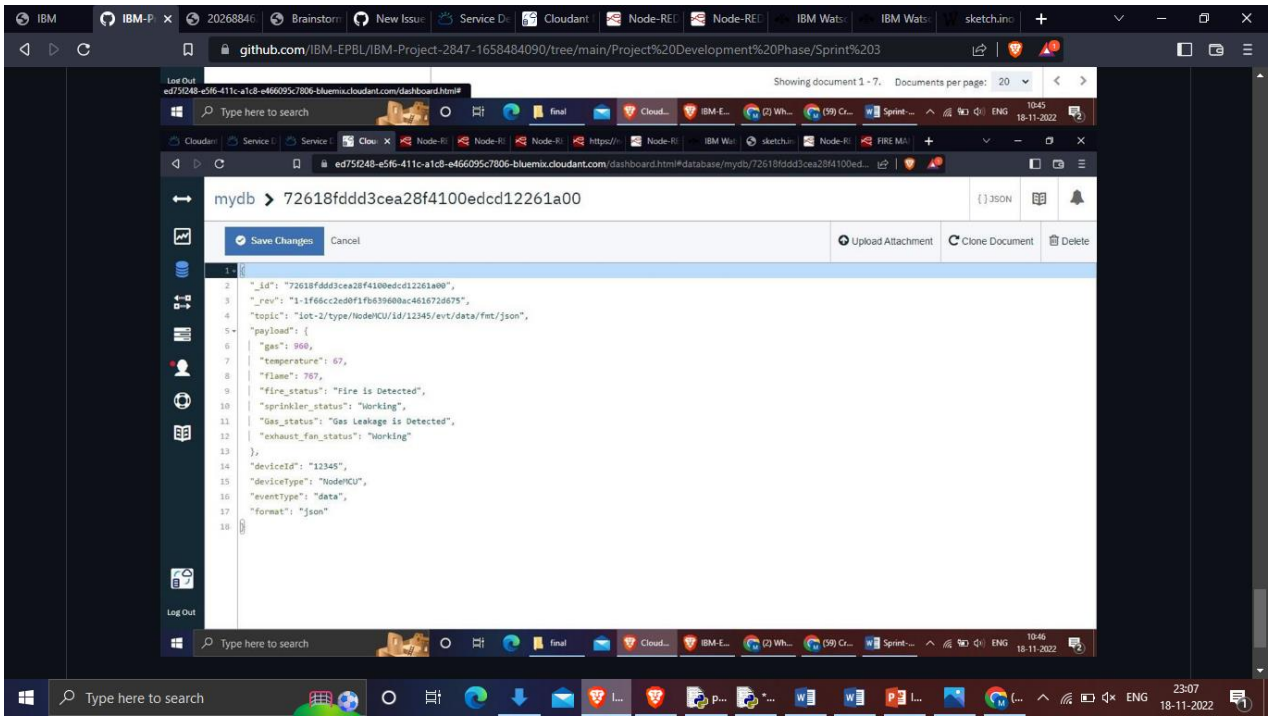
1. Working with the data set

2. Creating charts for data visualisation

3. Building the dashboard

7.3 Database Schema:





CHAPTER 8

8. Testing

8.1 Test Cases:

Testing is done to look for mistakes. Testing is the process of looking for any flaws or weaknesses in a piece of work. It offers a means of testing whether parts, sub-assemblies, assemblies, and/or a finished product perform properly. It is the process of testing software to make sure that it satisfies user expectations and meets requirements without failing in an unacceptable way. Different test types exist. Every test type responds to a certain testing requirement.

8.2 User Acceptance Testing :

Acceptance by users Any project's testing phase is crucial and necessitates the end user's active involvement. Additionally, it makes sure the system satisfies the functional specifications. At this step, all test cases are executed to make sure the software is accurate and complete.

Before the customer will accept the programme, the test must be successfully done. After customer personnel have verified that the preliminary production statistics load is accurate and that the test suite has been completed flawlessly, the customer formally accepts the delivery of this system.

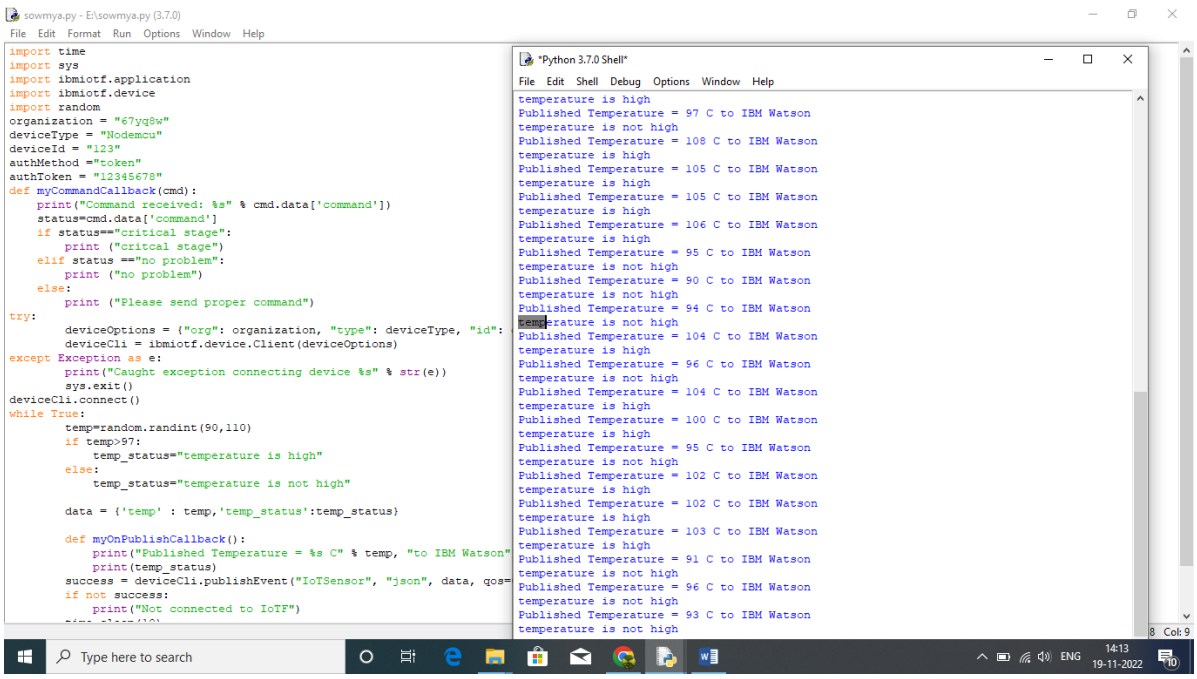
CHAPTER 9

9. RESULTS

9.1 Performance Metrics:

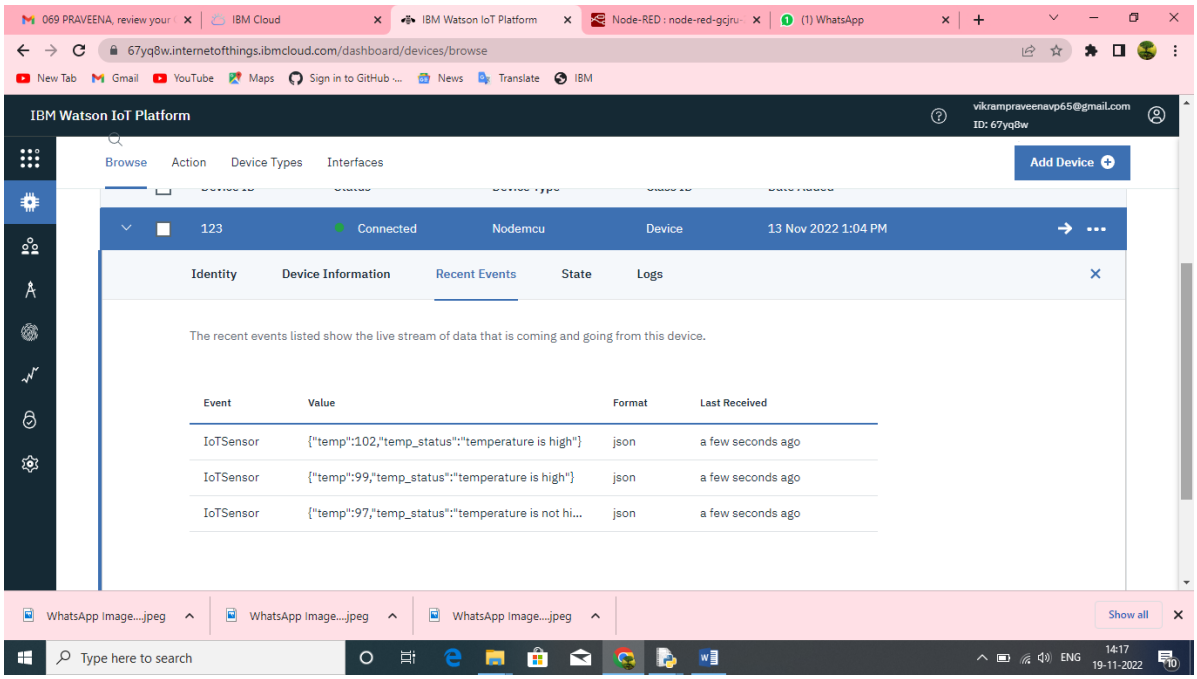
9.1.1 Python Code:

To create and execute the python program for the purpose of identify , detect and prevent the workers and their surrounding against fire accident. It send the detection of information to IBM Watson Cloud.



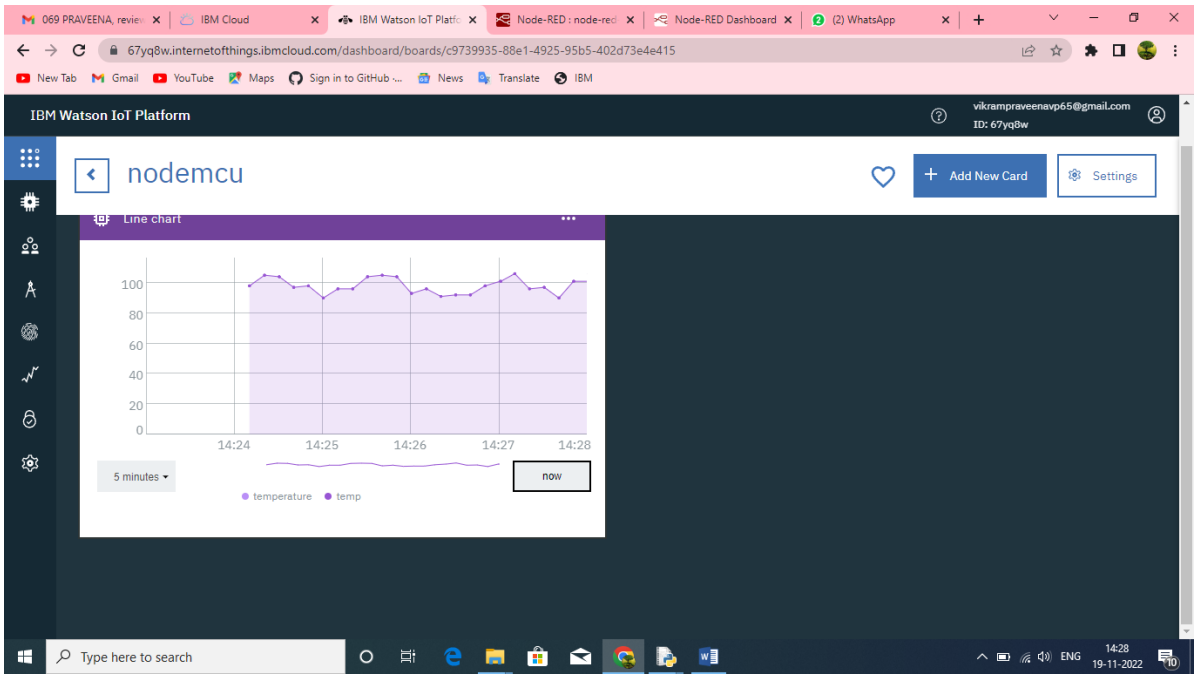
9.1.2 IBM Watson Output:

It is interconnect with Python code and transfer the detection of leakage output for preventing the industry and surroundings.



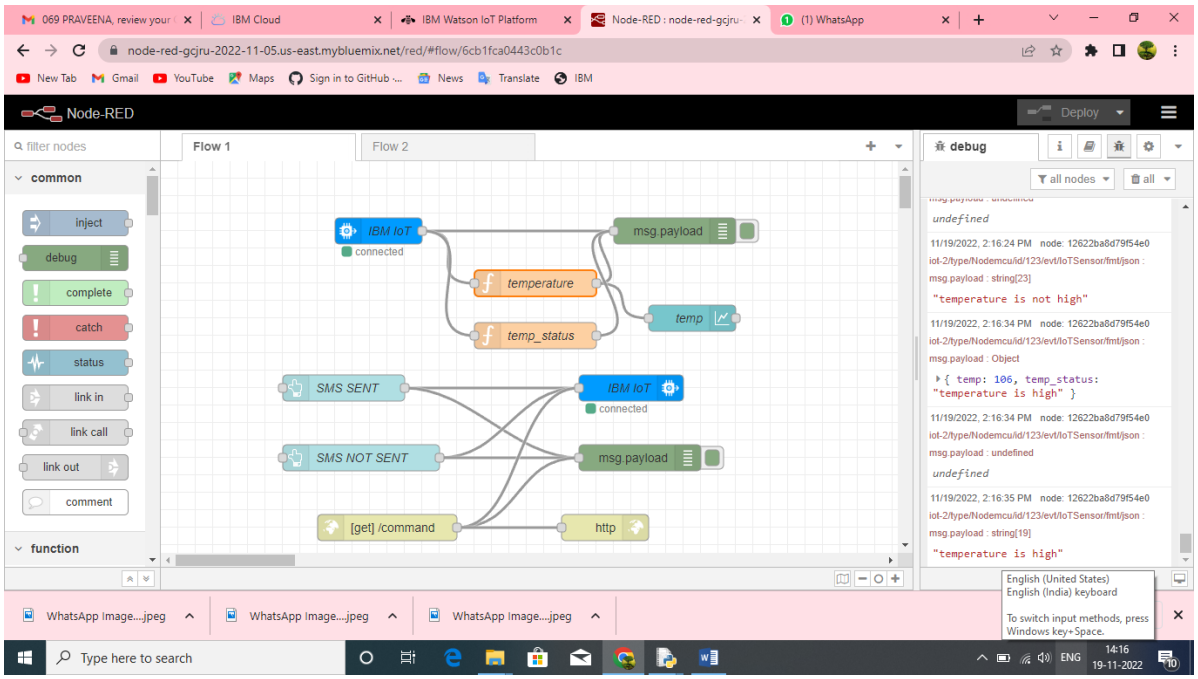
9.1.3 IBM Watson Dashboard :

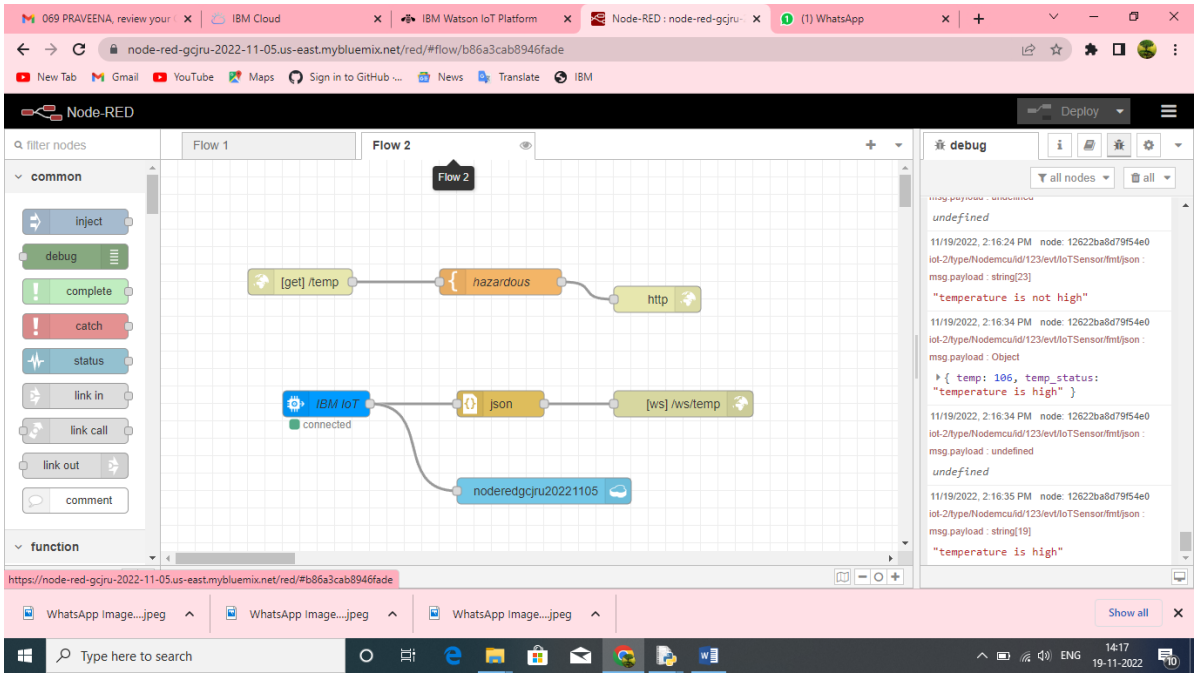
It is used to express the output in various form like flow chart, line chart, pie chart etc..



9.1.4 Node-Red :

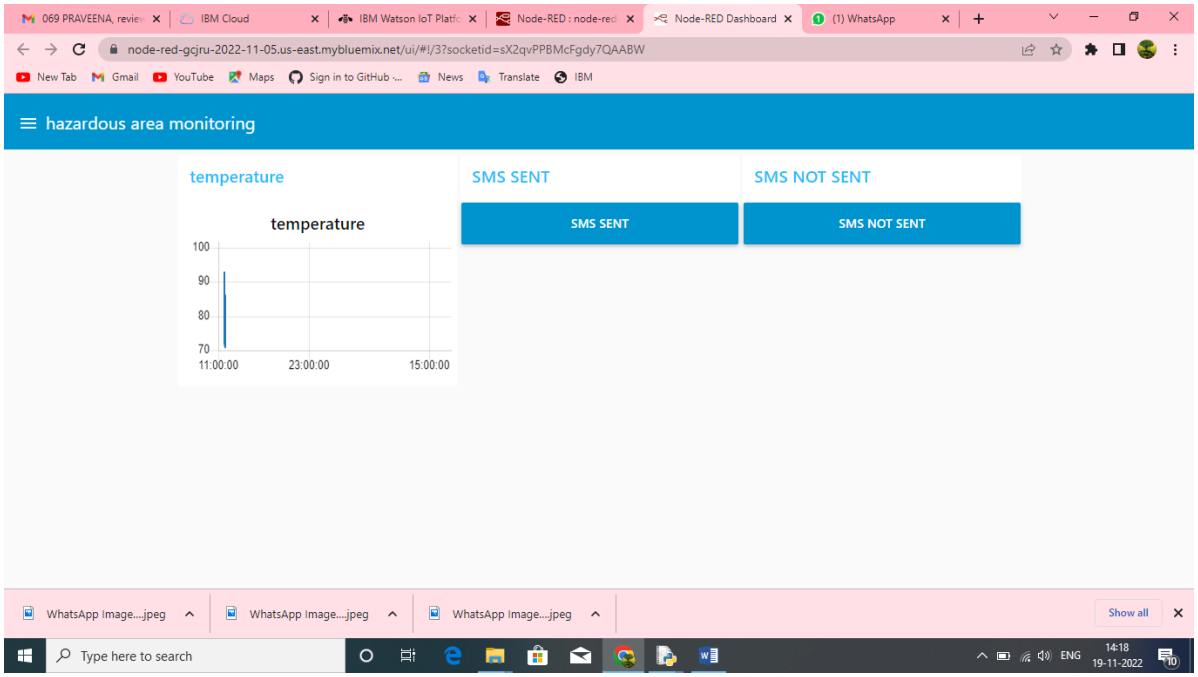
It interconnect with IBM watson and used to reate functionality by wiring together flows of data between nodes using a browser





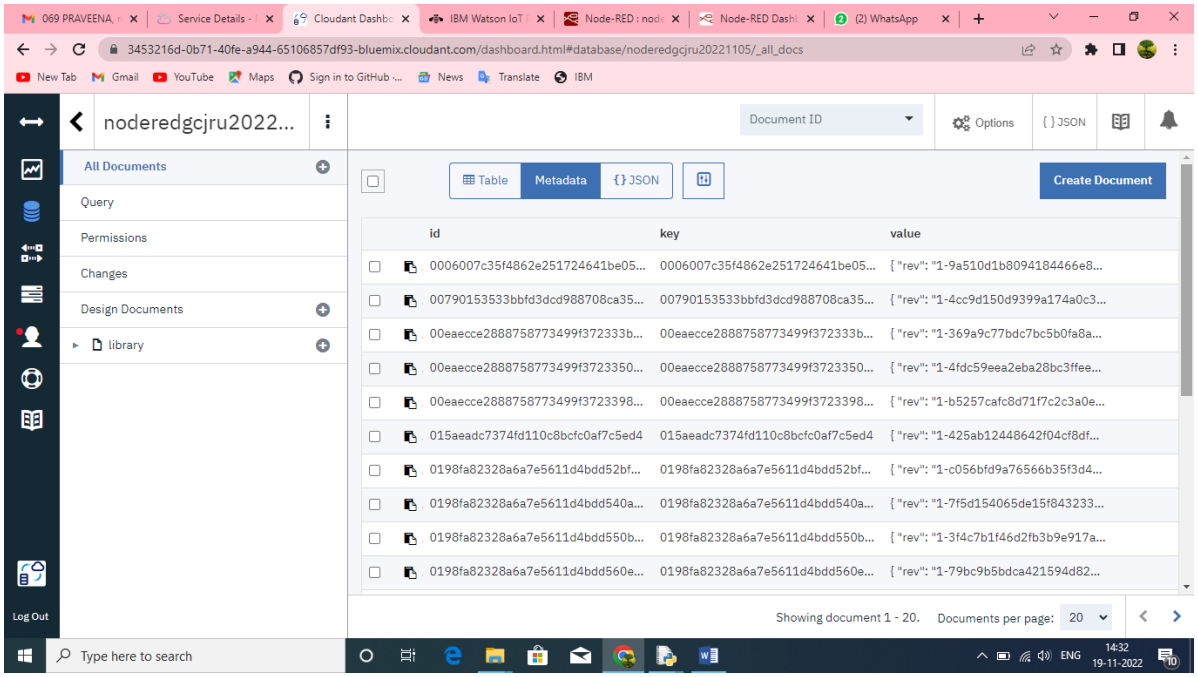
9.1.5 Node-Red Dashboard :

It is a module that provides a set of nodes in Node-RED to quickly create a live data dashboard. For example, it provides nodes to quickly create a user interface with buttons, sliders, charts, gauges, etc.

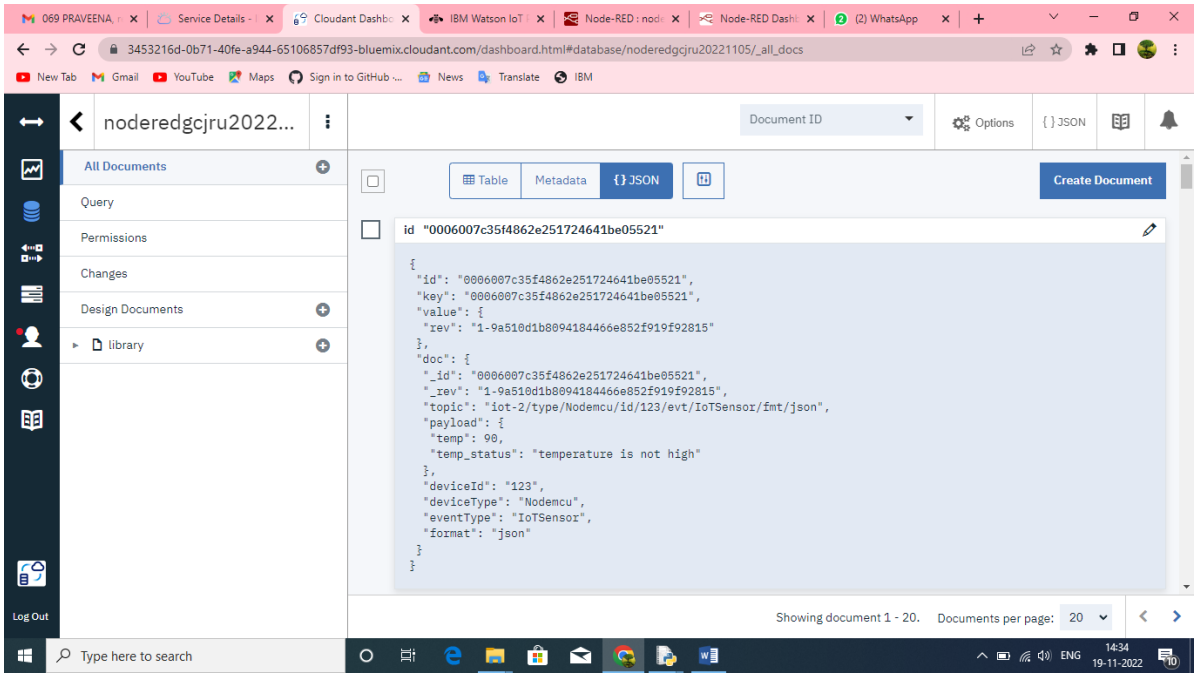


9.1.6 Cloudant :

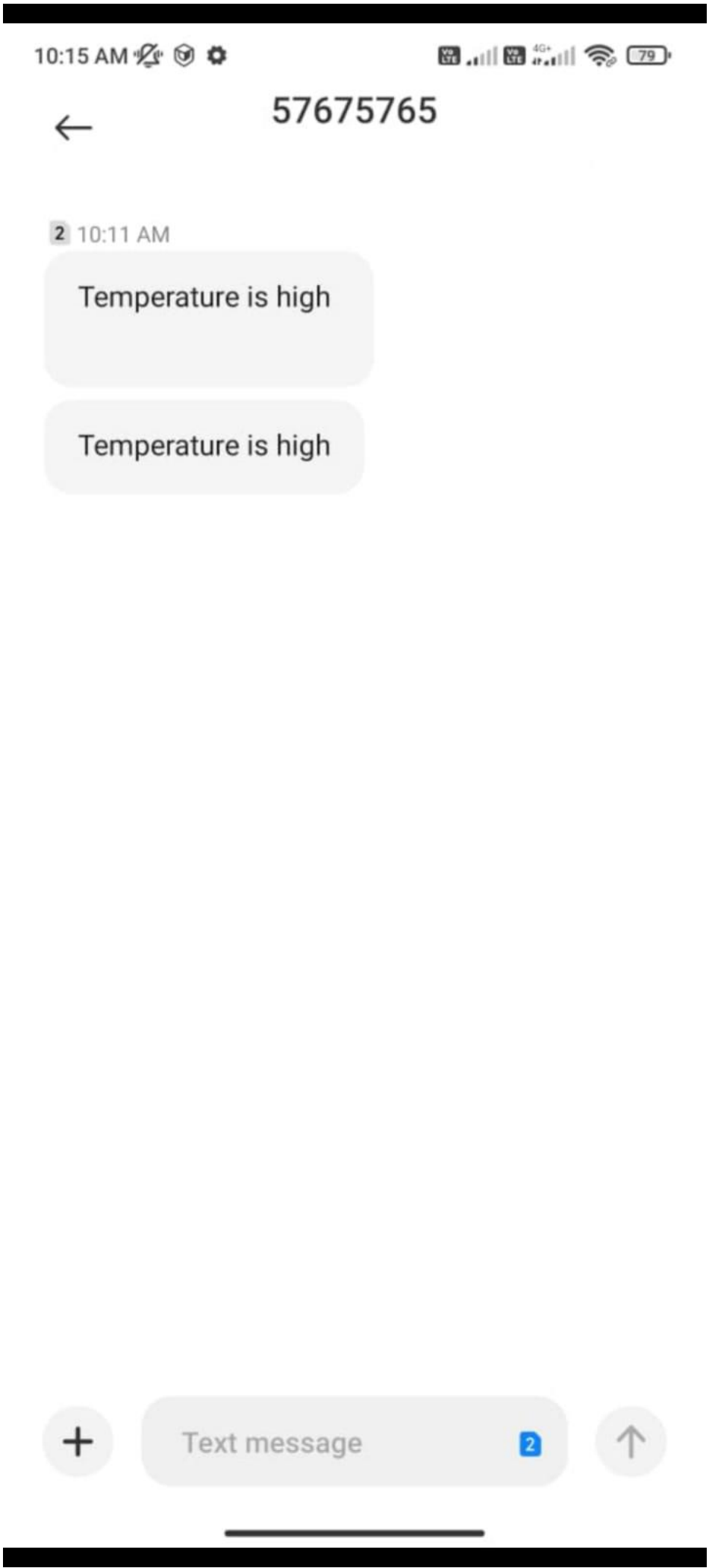
It handles software and hardware provisioning, management and scaling, and support.



9.1.7 Cloudant Dashboard:



9.1.8 SMS Output


10:15 AM
57675765
2 10:11 AM
Temperature is high
Temperature is high
Text message

CHAPTER 10

10.ADVANTAGES & DIS-ADVANTAGES

10.1 Advantages :

- When compared to hydroelectric producing stations, thermal power plants are less expensive to build initially.
- Compared to the hydroelectric power station, it takes up less space.
- Compared to gas, the cost of the fuel is lower.

- TPS is capable of producing a large quantity of electricity.
- Compared to diesel power plants, the cost of generating is lower.

10.2 Dis-Advantages :

- In comparison to hydro power stations, thermal power plants have higher operating costs.
- Due to the substantial smoke and fume generation, it pollutes the atmosphere.
- Cost of maintenance is higher.

- The power station needs to be built and maintained by skilled individuals.
- Storage of coal and ash requires more land.

CHAPTER 11

11. CONCLUSION

The IoT-based study can be improved even more by giving industry personnel advanced functions via an Android app to enhance industry control and monitoring. To protect workers and goods in the event of a fire or poisonous gas leak, smoke and tem sensors can also be connected to the system. Data can be used, among other things, to reduce industrial risks in well-known factories, monitor power plant production, ensure safety in fast-paced industries, and evaluate nuclear safety levels. If the information is given swiftly, time can be saved. The need for real-time monitoring systems based on physical models is necessary for accurate damage and defect identification.Through this project, we intend to obtain practical experience with the "Internet of Things" and "Embedded System" technologies that are now popular. In a number of industries, IoT-enabled industrial monitoring solutions are becoming more and more common because they raise safety standards by offering real-time monitoring of crucial characteristics as temperature, humidity, and smoke, as well as frequently informing authorities and staff. The deployment could boost industry yields in addition to being done for safety concerns. The Internet of Things (IoT) is utilized in our project to gather data and facilitate online communication. Our goal is to save lives and property from accidents and risks that industry frequently ignores by implementing our initiative in industries across India.

CHAPTER 12

12. FUTURE SCOPE

In our current concept, we solely use the GSM Technology to detect gases, temperatures, and people. Therefore, we might broaden the application of this idea in another method to centralize data collection. We can utilize the IR courting at the entry gate, which is tracked by the camera and will continuously record photos of the people entering the risky areas, for that purpose. Currently, only a few gases can be detected by gas sensors; however, in the future, we can expand to more types of gases.

CHAPTER 13

13.APPENDIX

13.1. Source Code :

```
import time
import sys
import ibmiotf.application
import ibmiotf.device
import random
organization = "67yq8w"
deviceType = "Nodemcu"
deviceId = "123"
authMethod ="token"
authToken = "12345678"
def myCommandCallback(cmd):
    print("Command received: %s" % cmd.data['command'])
    status=cmd.data['command']
```

```
    if status=="critical stage":
        print ("critcal stage")
    elif status =="no problem":
        print ("no problem")
    else:
        print ("Please send proper command")
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()
deviceCli.connect()
while True:
        temp=random.randint(90,110)
        data = {'temp' : temp,'temp_status':temp_status}

        if temp>97:
            temp_status="temperature is high"
        else:
            temp_status="temperature is not high"
        def myOnPublishCallback():
            print("Published Temperature = %s C" % temp, "to IBM Watson")
            print(temp_status)
        success = deviceCli.publishEvent("IoTSensor", "json", data, qos=0,
on_publish=myOnPublishCallback)
        if not success:
            print("Not connected to IoTF")
        time.sleep(10)
```

deviceClid.commandCallback=myCommandCallback

deviceCli.disconnect()

13.2. GitHub & Project Demo Link :

GitHub:

https://github.com/IBM-EPBL/IBM-Project-2883-1658485600

Project Demo Link:

PNT2022TMID13542 Hazardous area monitoring for power plants who are self reliant Praveena

https://youtu.be/JAhXN8x83HI