PROJECT REPORT

Date	18/11/2022
Team ID	PNT2022TMID46406
Project Name	Signs With Smart Connectivity For Better Road Safety

1. INTRODUCTION

1.1 Project Overview

In present systems the road signs and the speed limits are static. But the road signs can be changed in some cases. We can consider some cases when there are some road diversions due to accidents then we can change the road signs accordingly if they are digitalized. This project proposes a system which has digital sign boards on which the signs can be changed dynamically. If there is rainfall then the roads will be slippery and the speed limit would be decreased.When crowd or accident occur , it guides the travelers to choose best path. And it intimates the speed range depending upon roadway condition. Overall it helps to the traveler behaviour towards awareness of travel.

1.2 Purpose

1. To replace the static sign boards, smart connected sign boards are used.
2. These smart connected sign boards get the speed limitations from a web app using weather API and update automatically.
3. Based on the weather changes the speed may increase or decrease.

4. Based on the traffic and fatal situations the diversion signs are displayed.
5. Guide(Schools), warning and service(Hospitals, Restaurant)signs are also displayed accordingly.
6. Different modes of operations can be selected with the help of buttons.

2. LITERATURE SURVEY

2.1 Existing Problem

One of the main causes of accidents in sensitive public areas like schools, colleges, hospitals, etc. and sharp turning points in the over speed of vehicles avoiding the speed limit indicated i n the traffic sign board. Road accidents have now become a national catastrophe for overpopu lated developing countries. By not reducing their vehicle speed in these delicate public areas, drivers put the lives of passengers, pedestrians, and other drivers at danger. The suggested sys tem's primary goal is to run the vehicles at a safe speed in vital areas while reducing the poten tial danger of unintentional accidents and casualties. This project establishes a mechanism to notify drivers of speed limitations in particular locations and to slow down vehicles in sensitive public areas.

2.2 References

1. Chai K. Toh, Juan-Carlos Cano, Carlos Fernandez-Laguia, Pietro Manzoni, Carlos T. Calafate, Wireless digital traffic signs of the future, The Instituition of Engineering and Technology(IET)

   Description : In this architecture notify the sign can be narrated via voice to driver, in addition to displaying on the dashboard. , Changing a sign is easy as reprogramming it with advanced electronics and radio hardware embedded into poles, will be present to transmit programmed traffic signs wirelessly on the road.

2. Bhumika.R, Harshita. S.A, Meena. D, Asha. N, Accident Prevention and Road Safety in Hilly Region using IOT Module, International Research Journal of Engineering and Technology(IRJET). – 2021

   Description : Stay away from mishap & forestall clog in sloping region & hairclip twist. As a significant part of street mathematical plan bended street portion.

3. Pooja Pawar, SuvarnaLangade, MohiniBandgar , IOT Based digital Notice Board using Arduino ATMega 328, International Research Journal of Engineering and Technology(IRJET). - 2019.

Description : Circulates notice regularly & reduce physical efforts. Send message at any distant location within a second.

4. Sandeep Chaware, TrushithaChaware, Proposed Algorihm for Smart Traffic Control using Ultrasonic Sensor, International Journal of Engineering and Advanced Technology(IJEAT). - 2019.

   Description : The outcome of the project is to learn insights of the traffic controlling and management at the signal with the dynamically changing in timing of timer as per need.

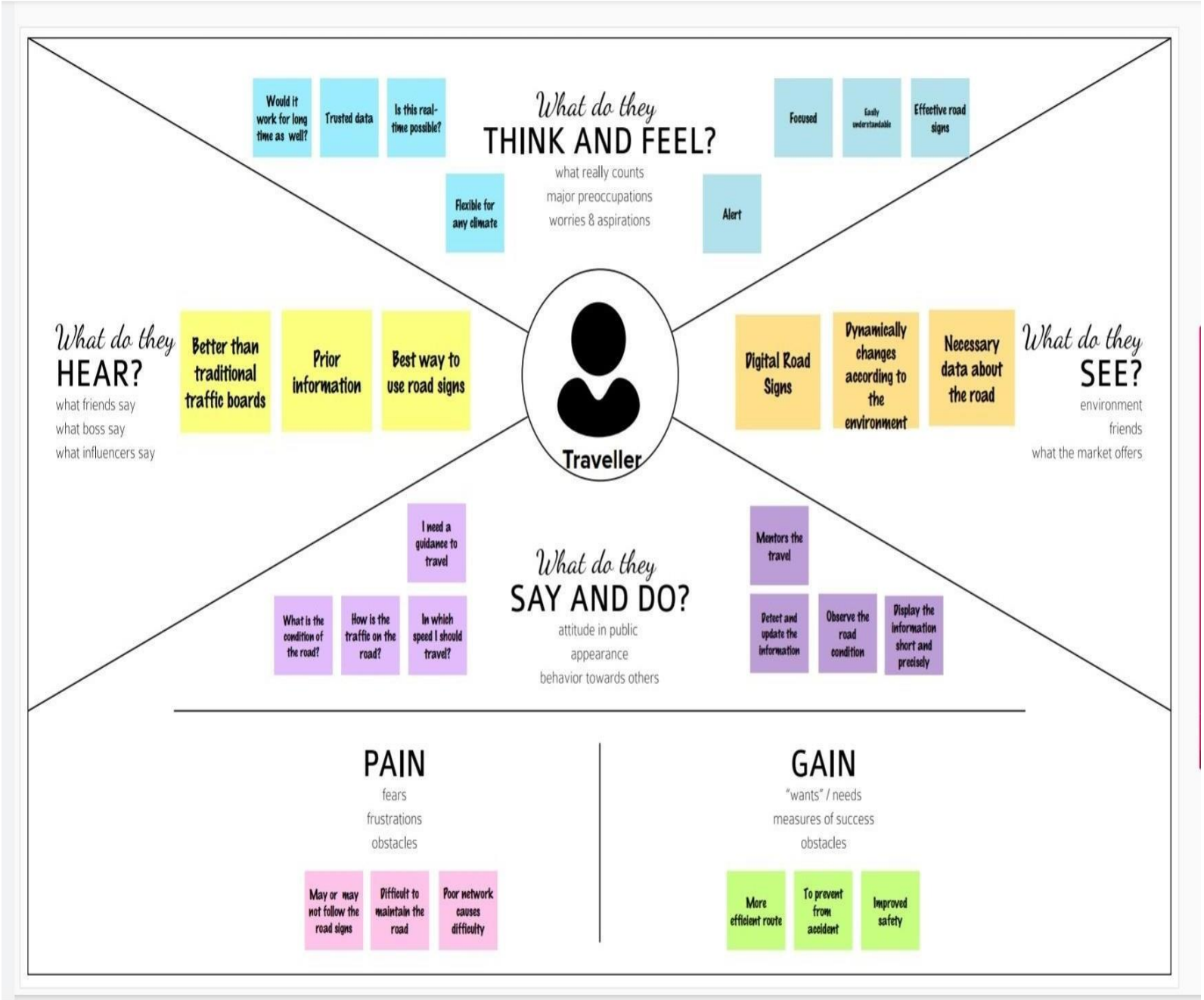
5. Deepika K. N, SangeethaThirumoorthy, Internet Of Things Based Notifications using Smart Notice Board, Sri Krishna College of Technology. - 2018

   Description : By using this system in the field of wireless communication we can make communication more effective, fast and very easy handling method. With the help of this, displaying of notices can be updated by every second from anywhere and anytime through a mobile phone.

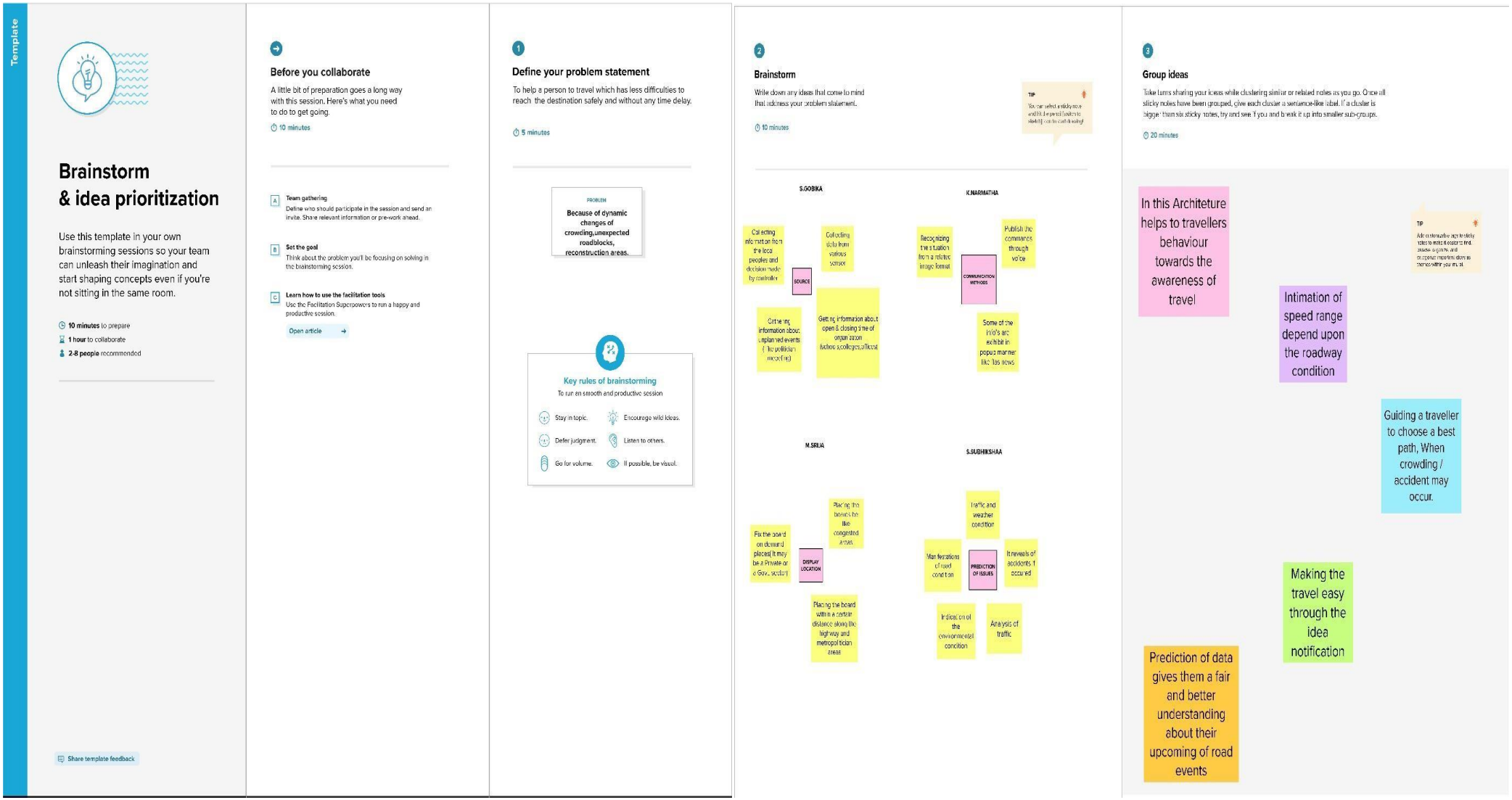
2.3 Problem Statement Definition

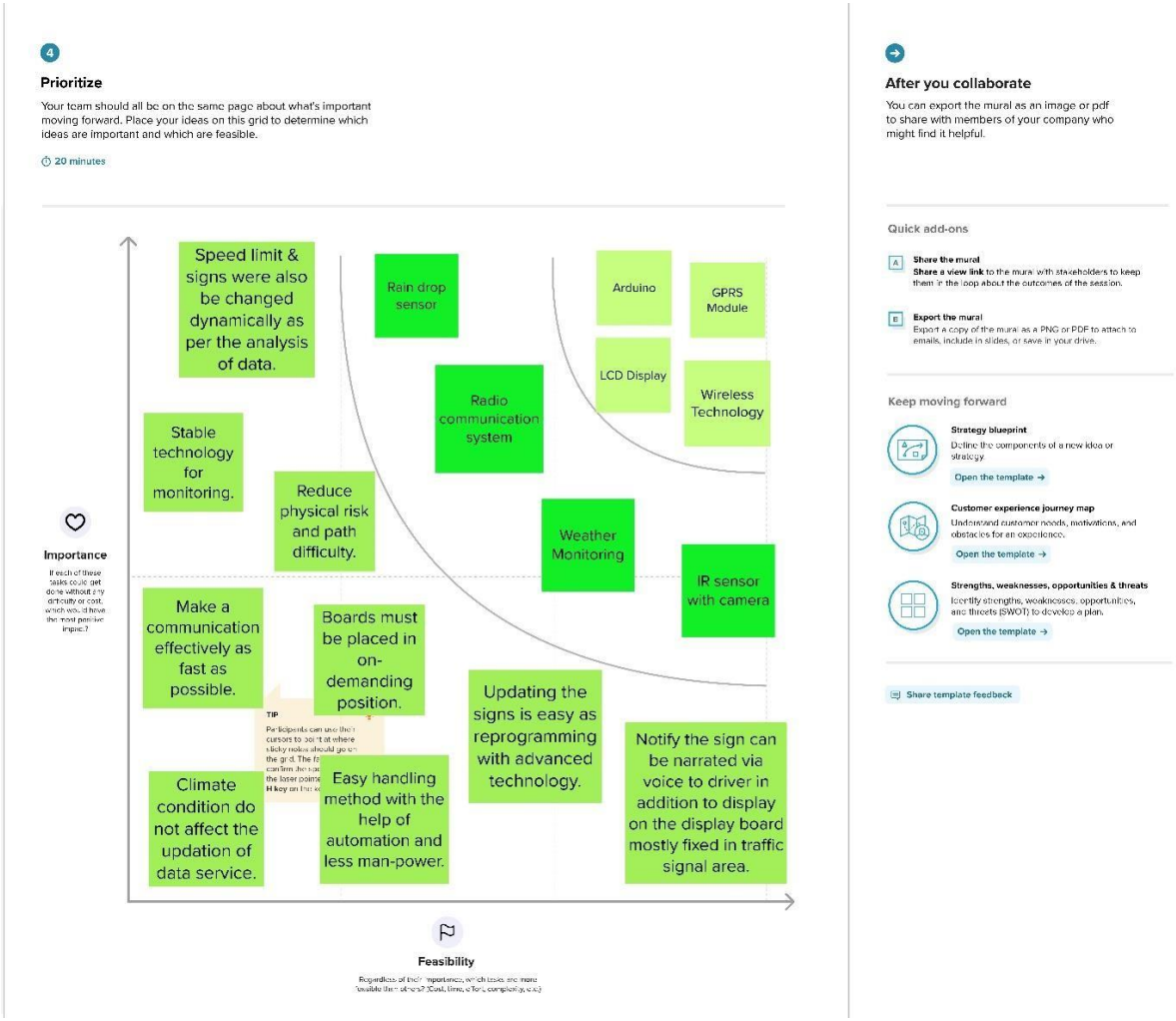
3. IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas



3.2 Ideation & Brainstroming





3.3 Proposed Solution

S.No	Parameter	Description
1.	**Problem Statement (Problem to be solved)**	The actual problem is that drivers are unable to know whether the road conditions is safe to travel or not. Hence there will be a need of guidance data for providing safety and to avoid travelling in convenience to reach destination.
2.	**Idea/Solution description**	This problem can be overcome by introducing the GPRS Module, IR Sensor with Camera to sense the traffic intensity even in dark areas. Rain drop sensor to indicate the accumulation of rain has occurred. And also collecting information from the local peoples and decision

		made by controller, who controls display manually(Manpower).
3.	**Novelty/Uniqueness**	Voice indicators are placed in near, the display board location adjusted to that traffic signal area. It will indicate the road dangers to the public as it senses then ear by vehicles. Speed limit changes according to the weather condition using rain drop sensor.

4.	**Social impact/Customer Satisfaction**	Large number of accidents may be minimized by replacing smart signs instead of static signs. Obvious information only displayed. Reports severity.
5.	**Business Model(revenue model)**	Systematic reduces manpower. The systems can be used in public and private sectors which gives good revenue. This type of system is helpful for education and medical institutions
6.	**Scalability of the Solution**	User friendly interface. Accessibility of data is easy from source.

		Precise information in sign boards can be easily captured

3.4 Problem Solution Fit

1. CUSTOMER SEGMENT(S) CS

- Awareness towards road infrastructure
- Data is useful in understanding the road user behavior & flow of traffic

6. CUSTOMER CONSTRAINTS CC

- Customers no need to spend any power (or)Network connection
- If they fail to obey traffic rules,then their money were marked as charged fines as per the court

5. AVAILABLE SOLUTIONS AS

- Record traffic offenses & provide existing data to collect, monitor,analyze with the periodic maintenance
- Monitoring the road events even in low

ExploreAS,differentia

2. JOBS-TO-BE-DONE/PROBLEMS

- Keep providing of valid data through dynamic signboard system helps to allow people predicting day to day complexities face along the road way
- Flow of data updating is quick & speedy, convenient and flexible

9. PROBLEM ROOT CAUSE

- Especially most of the people busy with their mobile phone actions leads to get distracted & they lose attention of traffic
- Simply, road accidents either due to carelessness(or) due to lack of road Safetyawareness

light (or) in bad weather conditions

7. BEHAVIOUR

- Customer need to make consciousness With regard to publicized instructions
- Obey the traffic signs &restrictions

FocusonJ&PtapintoBE, understandRC

3. TRIGGERS TR

- Creating a note that gives a direction on how to recognize that system effectively

10. YOUR SOLUTION SL

- Pre-functional record of specific voice record mode of data along with LED display provide in waiting time at traffic signs
- In this proposed system

8. CHANNEL of BEHAVIOUR CH

- Voice note
- Visual note

		is interface with Rain drop sensor check if it rainy there, to transmit data over IOT helps to display on LED to along with WIFI connection of internet changing data dynamically with current reporting of event sensing flow of Data	

	4. **EMOTIONS: BEFORE/AFTER** EM ➢ Before: Already existing of man-made static boards raising challenges due to un updated real-time issues &current changes of road events ➢ After: This system is better than existing method, of having automation of road signs & communication strategy in the manner of smart city to alert the drivers to reduce relay &congestion while travelling time		

4. REQUIREMENT ANALYSIS

4.1 Functional Requirements

	Functional Requirement (Epic)	**Sub Requirement (Story / Sub-Task)**
FR-1	User visibility	• Informations can be written in short form in the sign boards so that it can be very easily captured by drivers. • Place sign boards on popular places. • Symbols can be used so that drivers can save some amount of time in reading.

		• Static signs can be replaced by smart signs to reduce accidents.
FR-2	User convenience	• Display should be larger which can be visible from far distance.
FR-3	User need	• Awareness programmes should be conducted to bring awareness among the users about road safety. • Road safety education is essential for users.

4.2 Non-

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	• When crowd on accident occur it guides the travellers to choose best path. • Intimates the speed range depending upon roadway condition. • Ensure the vehicles are redirected to right path without causing much trouble for other drivers. • Easy to follow instructions based on given data on the digital board.
NFR-2	Security	• Prediction of data gives them a fair and better road understanding about their upcoming of toad events.
NFR-3	Reliability	• Helps to travellers behaviour towards awareness of travel.

Functional Requirements

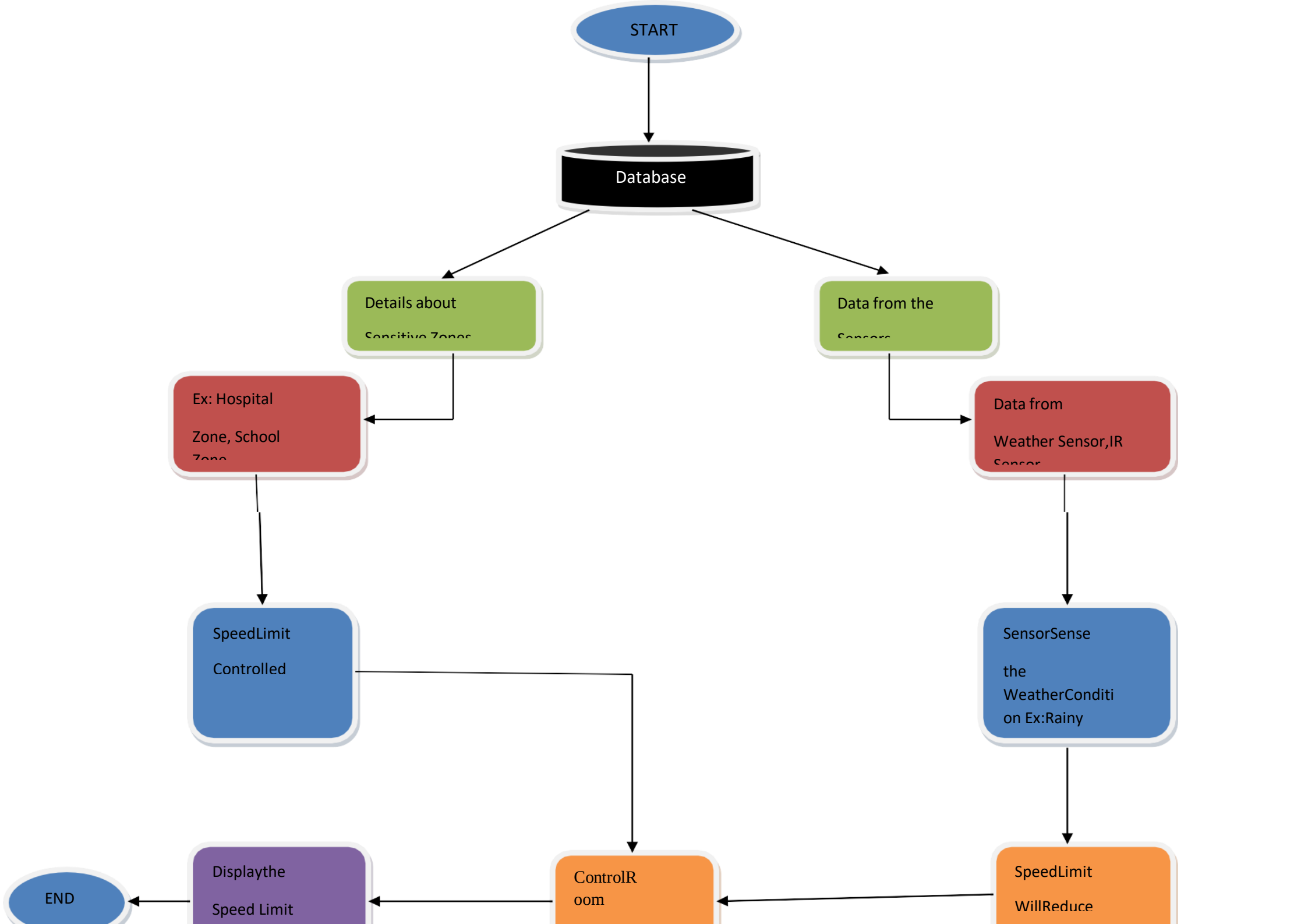
NFR-4	Performance	• Pre-functional record of voice record along with LED display provide in waiting time at traffic signs. • There is a rain drop sensor which checks whether there is a rain, to transmit data over IOT helps to display on LED along with wifi connection of internet changing data dynamically with current reporting of event sensing flow of data
NFR-5	Availability	• Monitors the road events even in low light on poor weather conditions. • Record traffic offenses
NFR	Scalability	• It is user friendly interface.

-6		• Data accessibility is easy from source.

5. PROJECT DESIGN

5.1 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.


START
Database
Details about
Sensitive Zones
Data from the
Sensors
Ex: Hospital
Zone, School
Zone
Data from
Weather Sensor,IR
Sensor
SpeedLimit
Controlled
SensorSense
the
WeatherConditi
on Ex:Rainy
END
Displaythe
Speed Limit
ControlR
oom
SpeedLimit
WillReduce

5.2 Solution & Technical Architecture

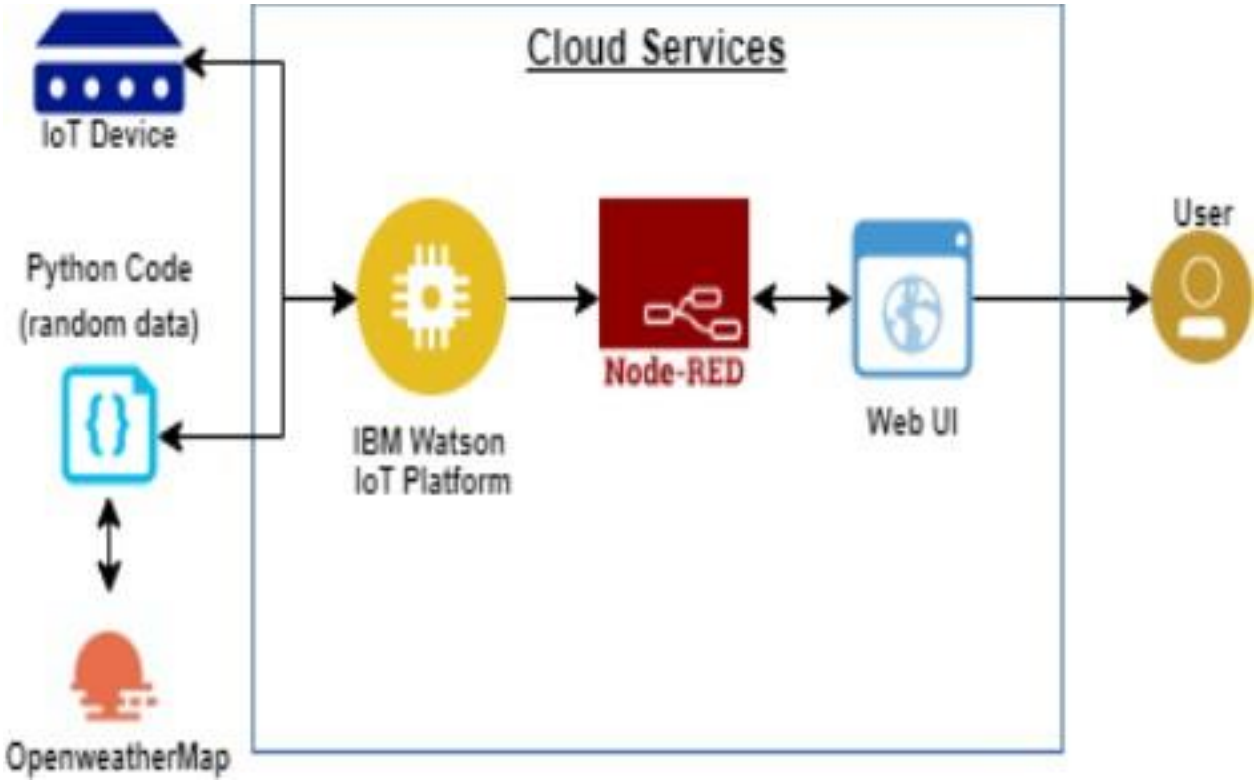


Table1: Components &Technologies:

	Component	Description	Technology
	User Interface	In what way we have to interact with the application	HTML, CSS, JavaScript
	Application Logic-1	Logic for a process in the application	Python/Java
	Application Logic-2	Logic for a process in the application	IBM Watson STT service
	Application Logic-3	Logic for a process in the application	IBM Watson Assistant
	Cloud Database	Cloud which has data base service	IBMDB2 , IBM Cloudant etc.,
	ExternalAPI-1	Purpose of External API used in the application	IBM Weather API

Table2: Application Characteristics:

	Characteristics	Description	Technology
	Security Implementations	Here no one will be able to access without login credentials in a very strong security system	IAM controls, Firewall, Cyber resiliency strategy
	Scalable Architecture	By increasing the bandwidth the operating range can be increased	IOT Internet
	Availability	Available 24/7	IBM Cloud
	Performance	It can support a large amount of users to access the technology	IBM Cloud

5.3 User Stories

User Type	Functional Requirement (epic)	User Story Number	User Story/Task	Acceptance Criteria
Customer (Drivers)	Distractions & Safety aspects	USN-1	The user don't know the road speed limit in the case of rainy or any other weather condition. So that they want to know appropriate speed limit for ensure safety.	The weather sensor s the weather condition data send to the serve
	Registration	USN-2	Login into the application	I can access dashboar
		USN-3	I will receive email once I have registered for the application	Receive email & con
		USN-4	Through sensor, speed limitation is controlled	Decrease the speed li
		USN-	I can get info	I can use the alternati

		5	about road accidents	route to reach my destination
Administrator	Analysis data & sending	USN-6	Monitoring & updating the information	Monitoring the sensor & sign board
Web users	Data producing	USN-7	Use of Node Red	Connect devices

6. PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation

	DESCRIPTION	DATE
reSurvey	Literature Survey is done with help of some research paper which is available in websites.	3 SEPTEMBER 2022
yMap	Empathy Map design is fully based on customer point of view**.**	10 SEPTEMBER 2022

	Our teammates work were work together to provide conceptualies towards brainstorm and idea prioritization.	17 SEPTEMBER 2022
n Statement	Problem Statement is entirely made with different perspective of customer requirement and issue based.	10 SEPTEMBER 2022
ed Solution	Proposed Solution contains the information in manner of parameters be like our ideas to b be fulfilled the customer satisfaction and provide good scalability business model.	24 SEPTEMBER 2022

Problem SolutionFit	Problem Solution Fit explore the customer behaviour and experience.	24SEPTEMBER2022
SolutionArchitecture	Solution Architecture fully focused on components and technology of our project.	19 SEPTEMBER 2022
Customer Journey	Customer Journey helps to analyze user interaction and kind of moments to attain the needs.	15 OCTOBER 2022
Functional Requirement	It is accomplished with task classification of functional requirement and non-functional requirement.	3 OCTOBER 2022

DataFlow Diagram	According to Data Flow Diagram exhibits the program architecture.	15 OCTOBER 2022
Technical Architecture	Technical Architecture is a better understanding of solution that have various technologies need to be Implemented in our project.	17OCTOBER 2022
Milestone & ActivityList	It shows our statistical dataprogress of our project deliverable state.	08 NOVEMBER 2022
Sprint Delivery	It is a kind of planning to define what can be delivere in the sprint and what kind of work have to be achieved On the timebase.	19 NOVEMBER 2022

6.2 Sprint Delivery Schedule

Sprint	Functional Requirement (Epic)	User Story/Task	Story Points	Priority	Team Members
Sprint-1	Resources Initialization	Create and initialize accounts in various public APIs like OpenWeatherAPI.	13	Low	S.Gobika, K. Narmatha,
Sprint-1	Resources Initialization	Create IBM Watson IOT Platform&Node-Red Services in IBM cloud.	5	Low	M.Srija, S.Subhikshaa
Sprint-2	Push the server/software to cloud	Develop a python script to retrieve data from API.Push thecode from Sprint 1 to cloud so it can be accessed fromanywhere.	10	Low	S.Gobika, S.Subhikshaa

Sprint-2	Sending data to cloud	Delevop a web using Node Red service for display weather data, by accessing the data from IBM Watson.	20	Medium	S.Gobika, K.Narmatha, M.Srija, S.Subhikshaa
Sprint-3	GPS module interconnection	Using GPS module, hospitals& schools are as are tracked and data is gathered then it's execute in a web user interface.	20	High	S.Gobika, K.Narmatha, M.Srija, S.Subhikshaa
Sprint-4	Collection of Data	Information about Traffic around the are a is gathered as a data.And the data is further encoded.	20	Medium	S.Gobika, K.Narmatha, M.Srija, S.Subhikshaa
Sprint-4	Setup	Data collected from sprint2 & sprint3 is deployed in Node-Red service to link API.	20	High	S.Gobika, K.Narmatha, M.Srija,

					S.Subhikshaa
	Service and Debugging	Better user experience		High	S.Gobika, K.Narmatha, M.Srija, S.Subhikshaa

Project Tracker,Velocity & Burndown Chart(4Marks):

Sprint	Total Story Points	Duration	Sprint Start Date	SprintEndDate (Planned)	StoryPoints Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6Days	24Oct2022	29Oct2022	20	29Oct2022
Sprint-2	20	6Days	31Oct2022	05Nov2022	20	02Nov2022
Sprint-3	20	6Days	07Nov2022	12Nov2022	20	09Nov2022
Sprint-4	20	6Days	14Nov2022	19Nov2022	20	17Nov2022

Velocity:

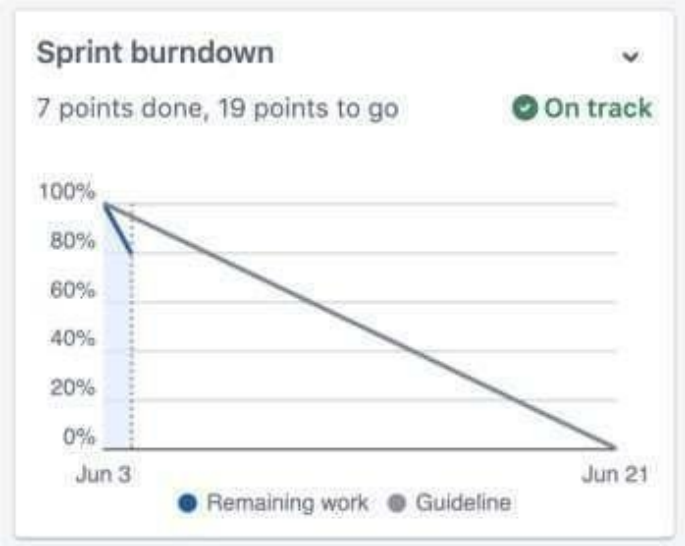
Imagine we have a 10-days print duration, and the velocity of the team is 20 (points per sprint). Let’s calculate the team’s average velocity(AV) per iteration unit(story points per day)

$$AV = \frac{sprint\ duration}{velocity} = \frac{20}{10} = 2$$

Given: Sprint duration=6Days velocity=20AV=6/20=0.3

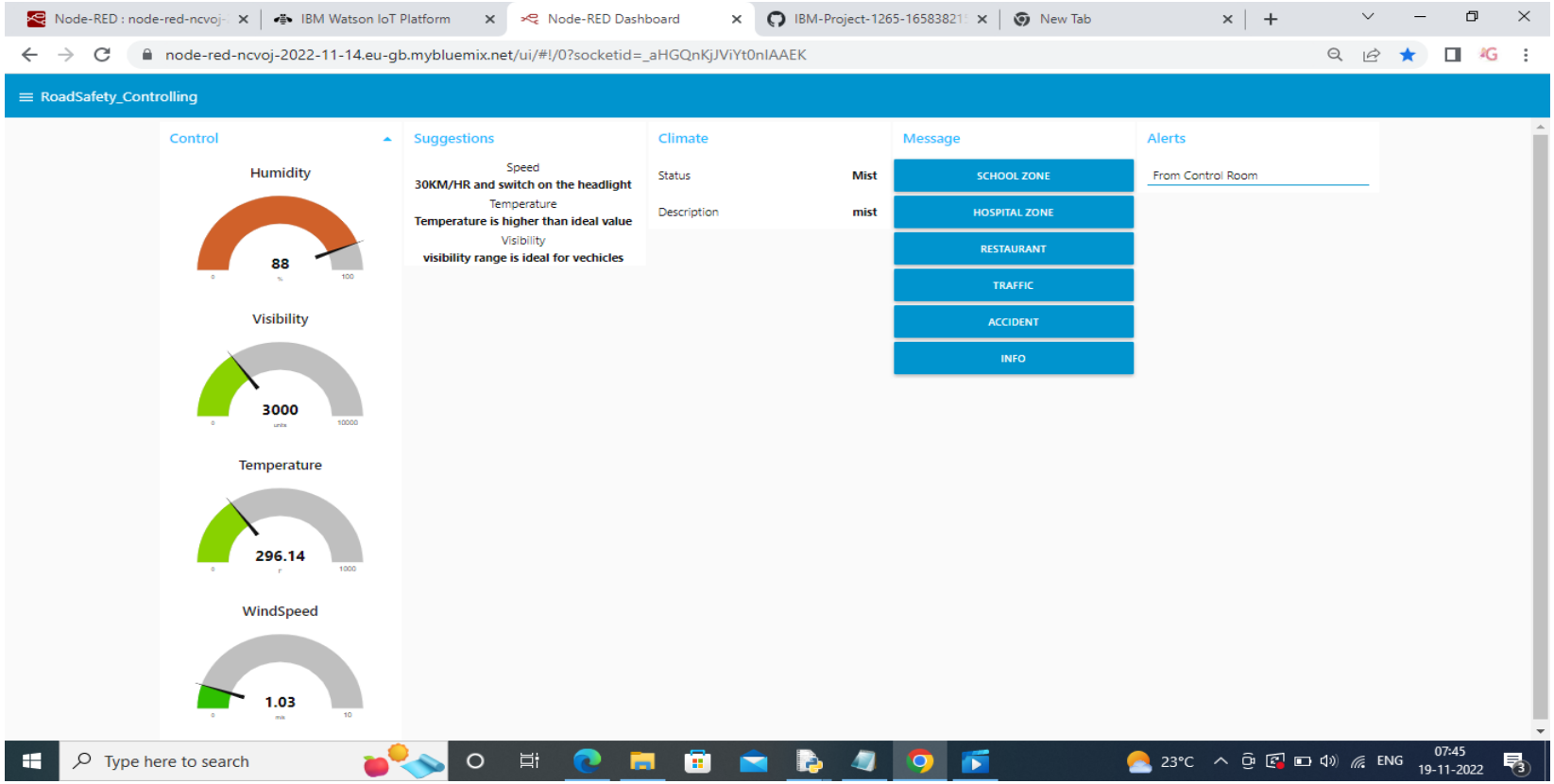
AV=0.3

Burndown chart:

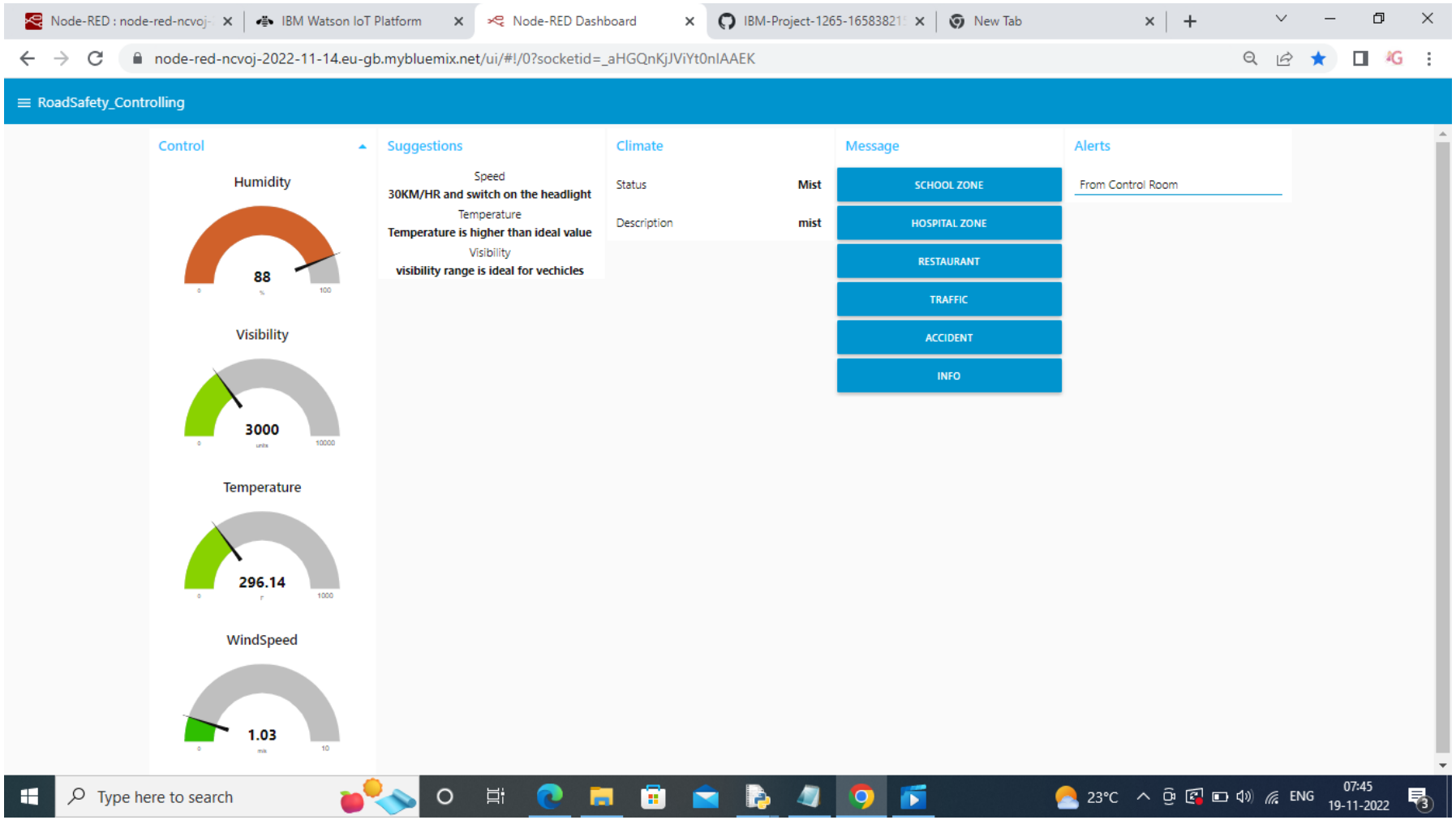


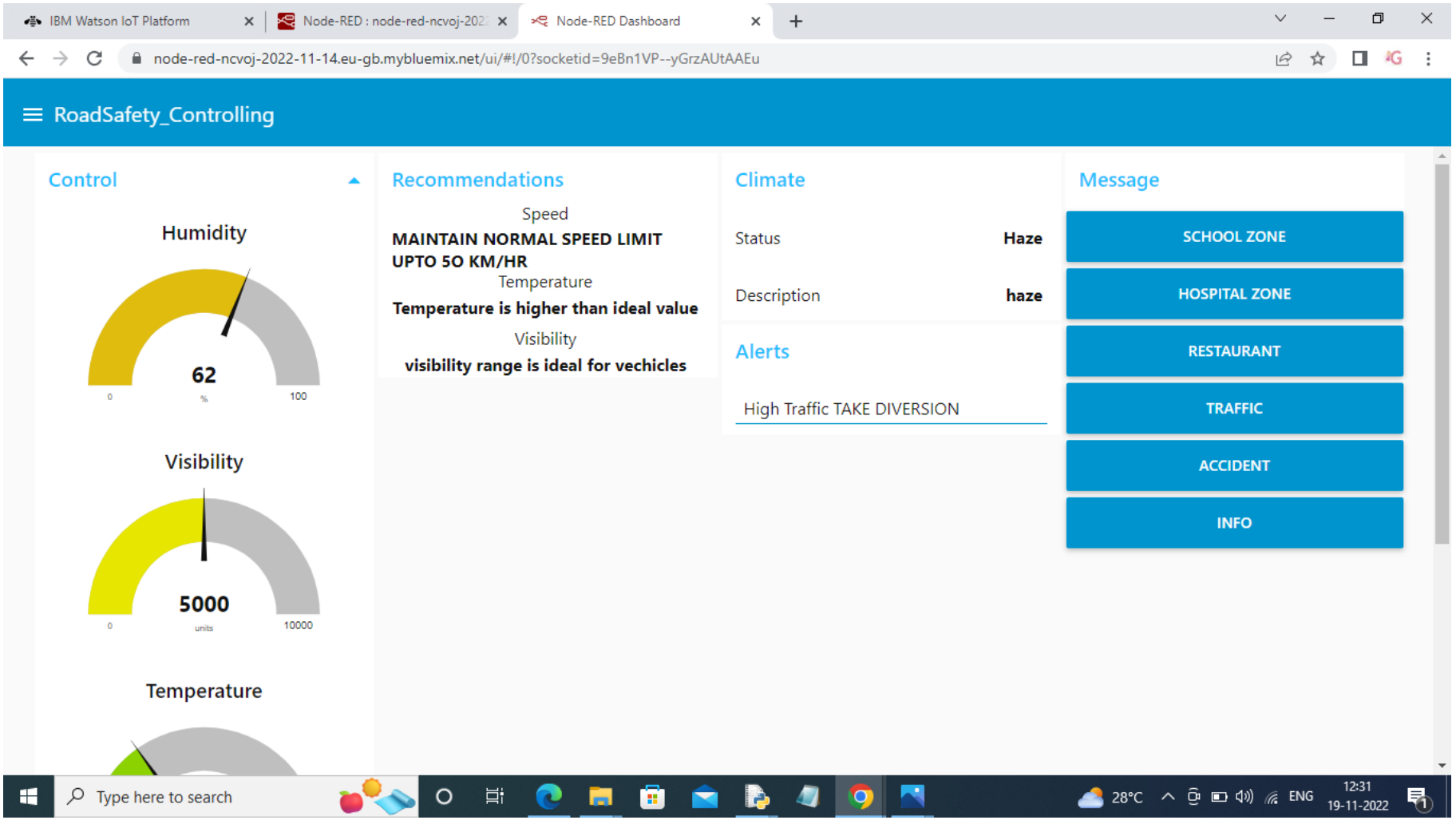
7. CODING & SOLUTIONING

7.1 Feature 1


Node-RED : node-red-ncvoj
IBM Watson IoT Platform
Node-RED Dashboard
IBM-Project-1265-16583821
New Tab
node-red-ncvoj-2022-11-14.eu-gb.mybluemix.net/ui/#!/0?socketid=_aHGQnKjJViYt0nIAAEK
RoadSafety_Controlling
Control
Humidity
88
Visibility
3000
Temperature
296.14
WindSpeed
1.03
Suggestions
Speed
30KM/HR and switch on the headlight
Temperature
Temperature is higher than ideal value
Visibility
visibility range is ideal for vechicles
Climate
Status
Mist
Description
mist
Message
SCHOOL ZONE
HOSPITAL ZONE
RESTAURANT
TRAFFIC
ACCIDENT
INFO
Alerts
From Control Room
Type here to search
23°C
ENG
07:45
19-11-2022

7.2 Feature 2


Node-RED : node-red-ncvoj-
IBM Watson IoT Platform
Node-RED Dashboard
IBM-Project-1265-16583821
New Tab
node-red-ncvoj-2022-11-14.eu-gb.mybluemix.net/ui/#!/0?socketid=_aHGQnKjJViYt0nIAAEK
RoadSafety_Controlling
Control
Humidity
88
Visibility
3000
Temperature
296.14
WindSpeed
1.03
Suggestions
Speed
30KM/HR and switch on the headlight
Temperature
Temperature is higher than ideal value
Visibility
visibility range is ideal for vechicles
Climate
Status
Mist
Description
mist
Message
SCHOOL ZONE
HOSPITAL ZONE
RESTAURANT
TRAFFIC
ACCIDENT
INFO
Alerts
From Control Room
Type here to search
23°C
ENG
07:45
19-11-2022


IBM Watson IoT Platform
Node-RED : node-red-ncvoj-202
Node-RED Dashboard
node-red-ncvoj-2022-11-14.eu-gb.mybluemix.net/ui/#!/0?socketid=9eBn1VP--yGrzAUtAAEu
RoadSafety_Controlling
Control
Humidity
62
0
%
100
Visibility
5000
0
units
10000
Temperature
Recommendations
Speed
MAINTAIN NORMAL SPEED LIMIT UPTO 50 KM/HR
Temperature
Temperature is higher than ideal value
Visibility
visibility range is ideal for vechicles
Climate
Status
Haze
Description
haze
Alerts
High Traffic TAKE DIVERSION
Message
SCHOOL ZONE
HOSPITAL ZONE
RESTAURANT
TRAFFIC
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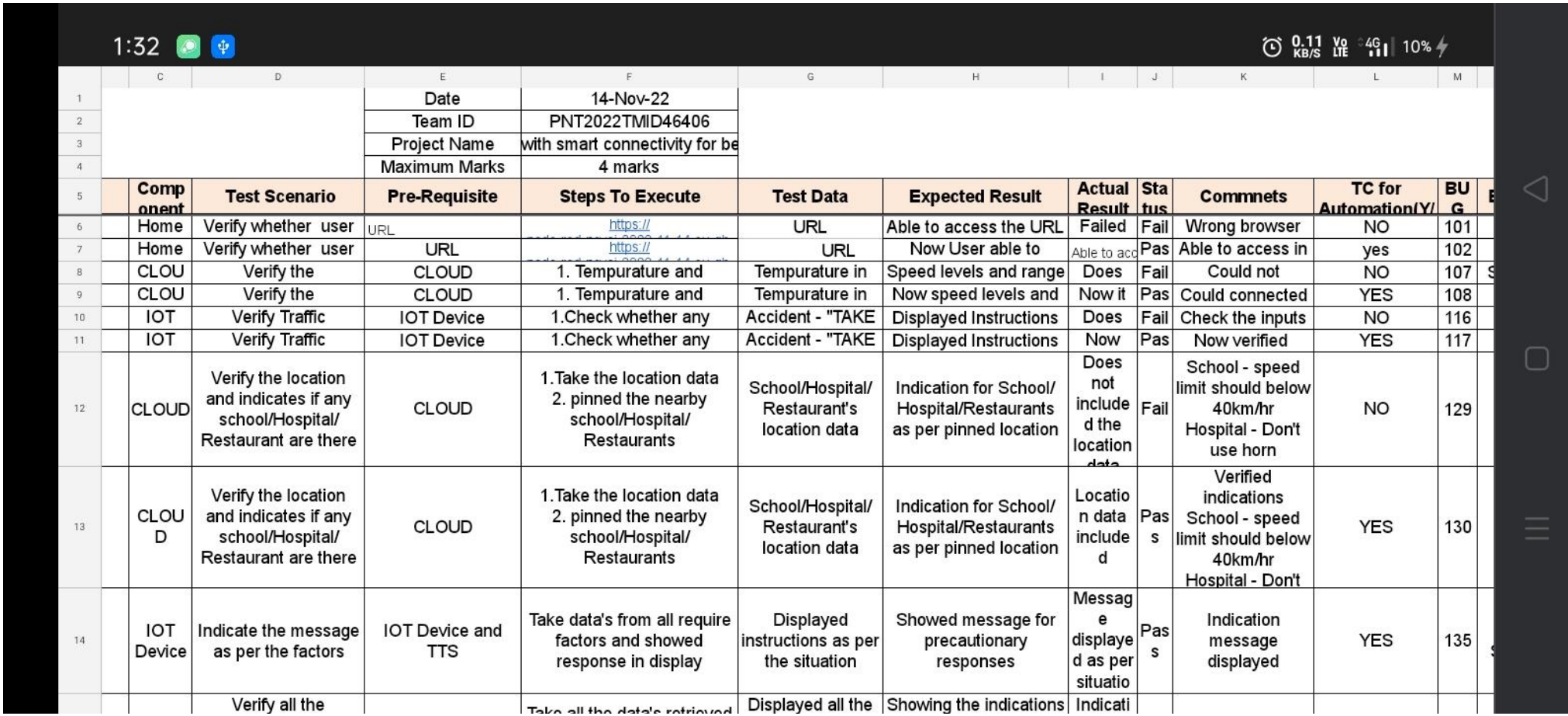
Type here to search
28°C
ENG
12:31
19-11-2022

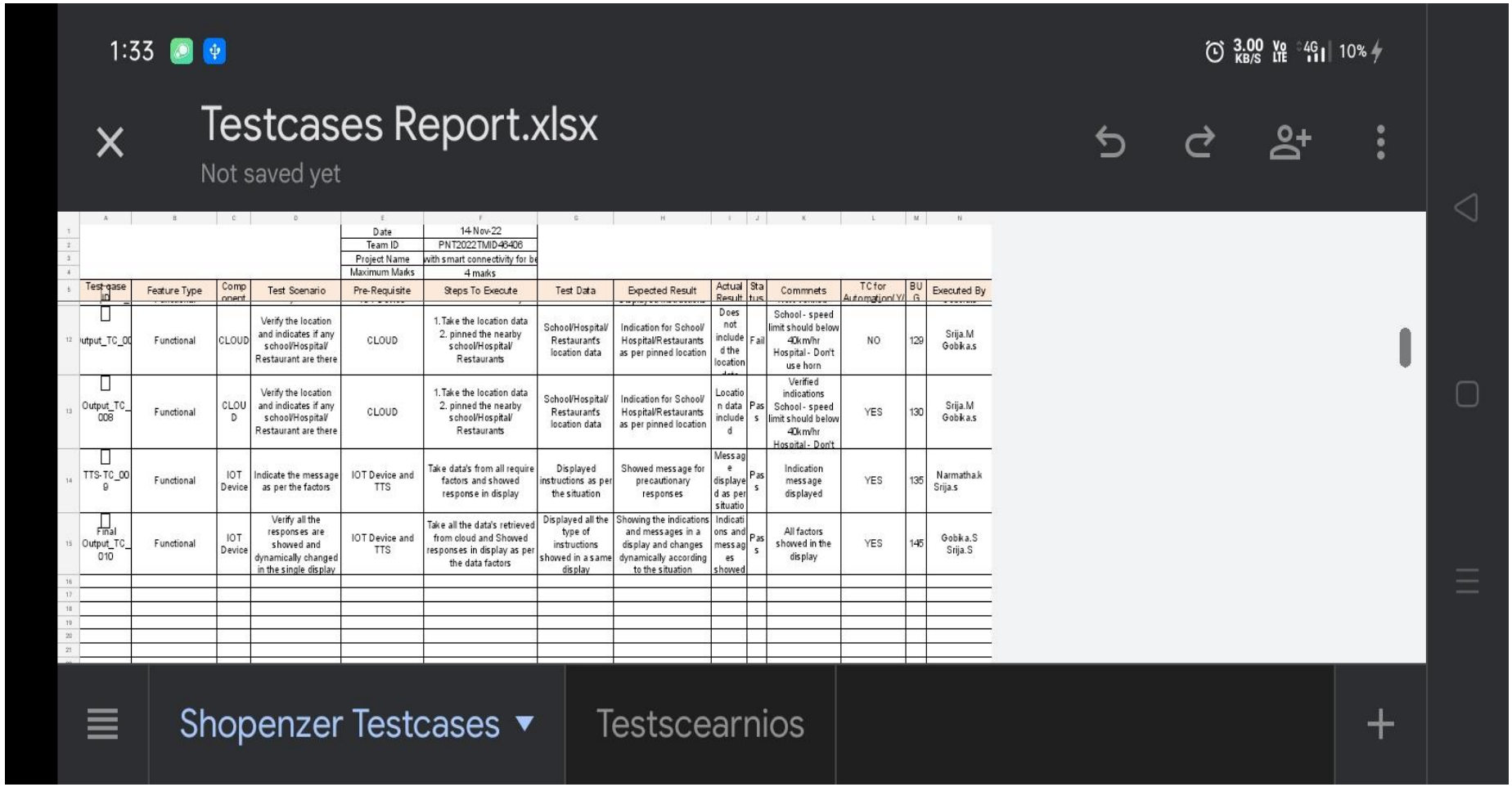
8 TESTING

8.2 Test Cases



Date	14-Nov-22		
Team ID	PNT2022TMID46406		
Project Name	with smart connectivity for be		
Maximum Marks	4 marks		

Component	Test Scenario	Pre-Requisite	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Commnets	TC for Automation(Y/	BUG
Home	Verify whether user	URL	https://	URL	Able to access the URL	Failed	Fail	Wrong browser	NO	101
Home	Verify whether user	URL	https://	URL	Now User able to	Able to acc	Pas	Able to access in	yes	102
CLOU	Verify the	CLOUD	1. Tempurature and	Tempurature in	Speed levels and range	Does	Fail	Could not	NO	107
CLOU	Verify the	CLOUD	1. Tempurature and	Tempurature in	Now speed levels and	Now it	Pas	Could connected	YES	108
IOT	Verify Traffic	IOT Device	1.Check whether any	Accident - "TAKE	Displayed Instructions	Does	Fail	Check the inputs	NO	116
IOT	Verify Traffic	IOT Device	1.Check whether any	Accident - "TAKE	Displayed Instructions	Now	Pas	Now verified	YES	117
CLOUD	Verify the location and indicates if any school/Hospital/ Restaurant are there	CLOUD	1.Take the location data 2. pinned the nearby school/Hospital/ Restaurants	School/Hospital/ Restaurant's location data	Indication for School/ Hospital/Restaurants as per pinned location	Does not included the location	Fail	School - speed limit should below 40km/hr Hospital - Don't use horn	NO	129
CLOUD	Verify the location and indicates if any school/Hospital/ Restaurant are there	CLOUD	1.Take the location data 2. pinned the nearby school/Hospital/ Restaurants	School/Hospital/ Restaurant's location data	Indication for School/ Hospital/Restaurants as per pinned location	Location data included	Pass	Verified indications School - speed limit should below 40km/hr Hospital - Don't	YES	130
IOT Device	Indicate the message as per the factors	IOT Device and TTS	Take data's from all require factors and showed response in display	Displayed instructions as per the situation	Showed message for precautionary responses	Message displayed as per situatio	Pass	Indication message displayed	YES	135
	Verify all the		Take all the data's retrieved	Displayed all the	Showing the indications	Indicati				



				Date	14-Nov-22								
				Team ID	PNT2022TMID46406								
				Project Name	with smart connectivity for be								
				Maximum Marks	4 marks								
Test-case ID	Feature Type	Comp onent	Test Scenario	Pre-Requisite	Steps To Execute	Test Data	Expected Result	Actual Result	Sta tus	Commnets	TC for Automation(Y/	BU G	Executed By
utput_TC_00	Functional	CLOUD	Verify the location and indicates if any school/Hospital/ Restaurant are there	CLOUD	1.Take the location data 2. pinned the nearby school/Hospital/ Restaurants	School/Hospital/ Restaurants location data	Indication for School/ Hospital/Restaurants as per pinned location	Does not included the location	Fail	School - speed limit should below 40km/hr Hospital - Don't use horn	NO	129	Srija.M Gobika.s
Output_TC_ 008	Functional	CLOUD	Verify the location and indicates if any school/Hospital/ Restaurant are there	CLOUD	1.Take the location data 2. pinned the nearby school/Hospital/ Restaurants	School/Hospital/ Restaurants location data	Indication for School/ Hospital/Restaurants as per pinned location	Location data included	Pass	Verified indications School - speed limit should below 40km/hr Hospital - Don't	YES	130	Srija.M Gobika.s
TTS-TC_00 9	Functional	IOT Device	Indicate the message as per the factors	IOT Device and TTS	Take data's from all require factors and showed response in display	Displayed instructions as per the situation	Showed message for precautionary responses	Message displayed as per situatio	Pass	Indication message displayed	YES	135	Narmatha.k Srija.s
Final Output_TC_ 010	Functional	IOT Device	Verify all the responses are showed and dynamically changed in the single display	IOT Device and TTS	Take all the data's retrieved from cloud and Showed responses in display as per the data factors	Displayed all the type of instructions showed in a same display	Showing the indications and messages in a display and changes dynamically according to the situation	Indications and messages showed	Pass	All factors showed in the display	YES	145	Gobika.S Srija.S

8.3 User Acceptance Testing

1. Purpose of Document

The purpose of this document is to briefly explain the test coverage and open issues of the web UI which provides signs with smart connectivity for better road safety at the time of the release to user acceptance testing.

2. Defect analysis

Section	Total Cases	Not tested	Fail	Pass
Print Engine	20	0	0	10
Client application	21	0	0	20
Security	4	0	0	4

This report shows the no.of resolved or closed bugs at each severity level, and how they were resolved.

Resolution	Severity 1	Severity2	Severity 3	Severity 4	Subtotal
By design	7	3	2	2	14
Duplicate	4	0	4	0	8
External	4	2	0	2	8
Fixed	6	1	3	8	18
Not reproduced	0	0	0	0	0

Skipped	2	1	2	1	6
Won’t fix	0	2	1	1	4
Totals	23	9	12	14	58

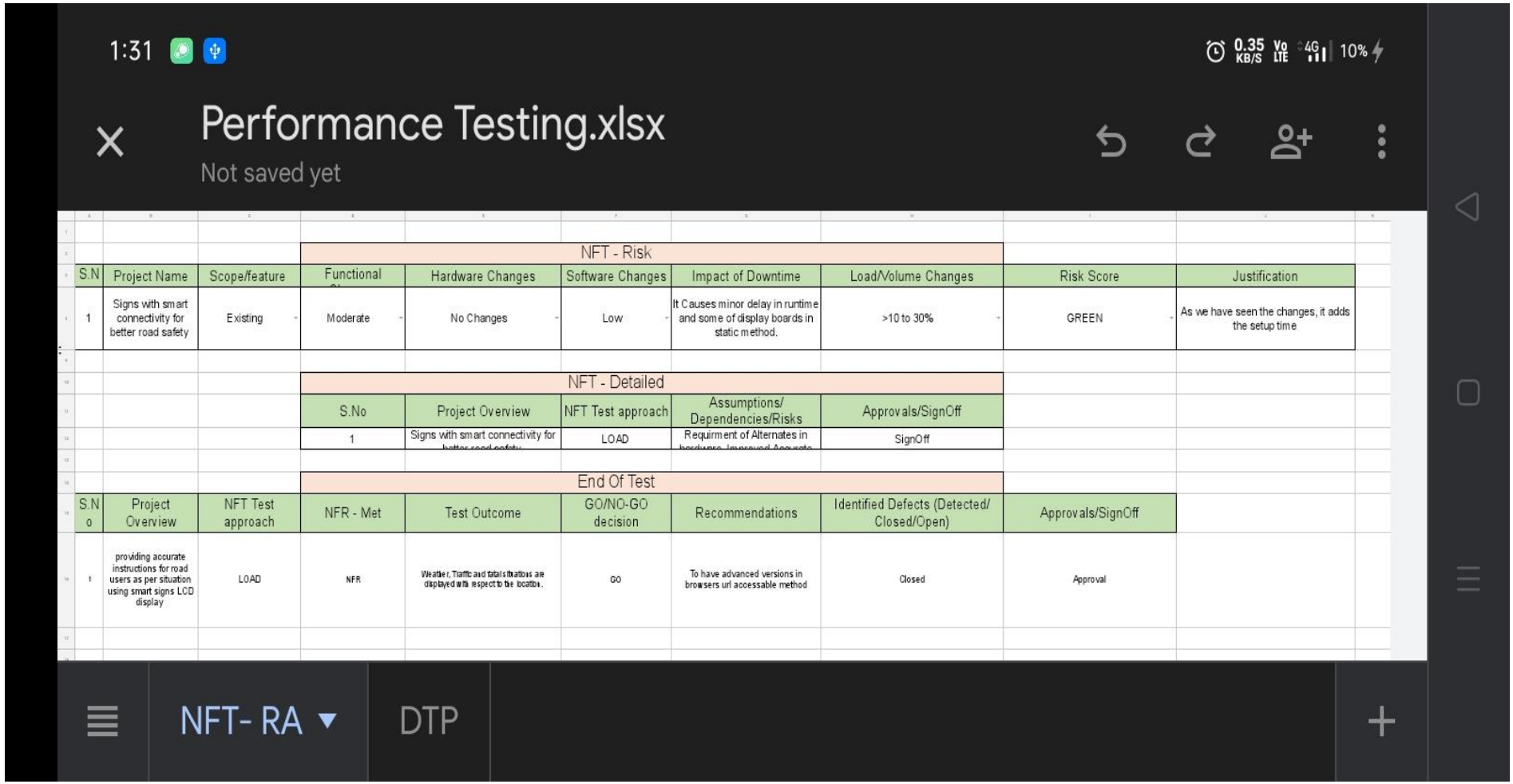
Test Case Analysis

This report shows the no.of test cases that have passed ,failed, untested.

Outsource shipping	4	0	0	4
Exception reporting	5	0	0	5
Final report output	4	0	0	4
Version control	3	0	3	3

9 RESULTS

9.1 Performance Metrics



10.**ADVANTAGES & DISADVANTAGES**

Advantages:

- ➢Enable a better way for drivers to access the information.
- ➢Smart intersection help to address increasing traffic density and improve road safety.
- ➢Can also help cities adapt for long term sustainable tranportation needs.
- ➢It enables you to control traffic, catch lawbreakers, and provide road safety.

Disadvantages:

- ➢May give faulty results.
- ➢Not the best option for long distance.
- ➢Not practical for all roads.

11.CONCLUSION

This work illustrates the viability of an economic road safety monitoring and assessment solution. through exploiting advances in the Internet of Things (IoT) within the context of smart cities.

The introduced architecture facilitates robust and dynamic road safety assessment that complements the Safe System approach motivated by the World Health Organization (WHO), which has been increasingly adopted worldwide. An application of the dynamic assessment framework for route planning is also demonstrated.
Future work involves exploring further applications, especially in the context of raising driver awareness of the road safety conditions during their trips.

12.FUTURE SCOPE:

- To create traffic free city
- To maintain zero accidents
- Spread all the road rules to all road user.

13. APPENDIX

SOURCE CODE :

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

```
import random
import requests
from pprint import pprint



#Provide your IBM Watson Device Credentials
organization = "uaortj"
deviceType = "weatherapptype"
deviceId = "weatherappid"
authMethod = "token"
authToken = "app12345678"

city = input('Enter your city : ')

url =
'http://api.openweathermap.org/data/2.5/weather?q={}&appid=b23b5fad240356d80f95242dcf1d
6cad'.format(city)

res = requests.get(url)

data = res.json()
```

```
temp = data['main']['temp']
humidity = data['main']['humidity']

wind_speed = data['wind']['speed']

latitude = data['coord']['lat']
longitude = data['coord']['lon']

visibility = data['visibility']

main = data['weather'][0]['main']
description = data['weather'][0]['description']

print('Temperature : {} degree celcius'.format(temp))
print('Humidity : {} %'.format(humidity))

print('Wind Speed : {} m/s'.format(wind_speed))

print('Latitude : {}'.format(latitude))
print('Longitude : {}'.format(longitude))

print('Visibility : {}'.format(visibility))
```

```
print('Main : {}'.format(main))
print('Description : {}'.format(description))

#TRAFFIC AND FATAL SITUATION ALERT BY ROADSAFETY CONTROL
OFFICE(SPRINT 3) - {REQUIREMENT 2 OF THE PROJECT TO DISPLAY
THE ALERT AND DIVERSION MESSAGE THAT WAS FROM ROAD
SAFETY OFFICE

import wiotp.sdk.device
#importing library files for connecting with CLOUD,sdk=software developement kit
import requests
#for API request
import json
#converting it to json(key:values)
myConfig = {
    "identity": {
        "orgId": "uaortj",
        "typeId": "Monitor_devicetype",     #configuration wit CLOUD,finding identity
        "deviceId":"Monitor_deviceid"
        },
    "auth": {
```

```
        "token": "sngs123monitor"   #authenticating with cloud device
        }
    }

#TRAFFIC AND FATAL SITUATION ALERT MESSAGE DISPLAYING IN WEB UI
WHWN THE
client = wiotp.sdk.device.DeviceClient(config=myConfig, logHandlers=None)
#initialising device client with above myconfig detail
client.connect()
def myCommandCallback(cmd):
    print("Message received from IBM IoT Platform: %s" %cmd.data['command'])
    m=cmd.data['command']
    ALERT=""
#THIS IF CONDITION BLOCK IS FOR TRAFFIC AND FATAL SITUATION ALERT
MESSAGE DISPLAYING IN WEB UI WHEN THE MESSAGE WAS RECEIVED FROM
THE ROAD SAFETY OFFICE
    if (m=="TRAFFIC"):
        ALERT="TRAFFIC - TAKE DIVERSION"
        print("*****///TAKE DIVERSION///*****")
    elif(m=="ACCIDENT"):
        ALERT="ACCIDENT - TAKE DIVERSION"
        print("*****///TAKE DIVERSION///*****")
```

```
    else:
        ALERT="HAVE A NICE DAY!"
        print("HAVE A NICE DAY!")
        mydata1={"SITUATION":ALERT,}
        client.publishEvent("Monitor_deviceid","json",mydata1)
while True:
        print("=====================================")
        weatherData =
requests.get('https://api.openweathermap.org/data/2.5/weather?q=Chennai,IN&appid=b23b5fad2
40356d80f95242dcf1d6cad')
        b = weatherData.json()
        temp = b["main"]["temp"]
        humi = b["main"]["humidity"]
        main = b["weather"][0]["main"]      #0th index is taken from the object
        description = b["weather"][0]["description"]
        visibility = b["visibility"]
        Windspeed = b["wind"]["speed"]
        TemperatureRecommendation =""
        SpeedRecommendation = ""
        RecommendationForVisibilty = ""
#print("Temperature(celcius) :",b["main"]["temp"])
        if(temp > 33):
```

```
            TemperatureRecommendation="Temperature is higher than ideal value"
            print("Temperature is higher than ideal value")
        elif(temp<19):
            TemperatureRecommendation="Temperature is lower than ideal value"
            print("Temperature is lower than ideal value")
        else:
            TemperatureRecommendation="Temperature is ideal"
            print("Temperature is ideal ")
    #print("Humidity :",b["main"]["humidity"])
    #print("WeatherCondition",(b["weather"][0]["main"]))
        if(main == "Rain"):
            rain = b["rain"]["1h"]
            SpeedRecommendation = "30KM/HR ,ROAD WILL BE SLIPPERY"
#print("Rain:",b["rain"]["1h"])
#print("SPEED RECOMMENDATION : 30KM/HR ,ROAD WILL BE SLIPPERY")
        elif(main == "Drizzle"):
            SpeedRecommendation = "30KM/HR"
#print("SPEED RECOMMENDATION : 30KM/HR")
        elif(main == "Mist"):
            SpeedRecommendation = "30KM/HR and switch on the headlight"
#print("SPEED RECOMMENDATION : 30KM/HR and switch on the Headlight")
        elif(main == "Thunderstorm"):
```

```
            SpeedRecommendation = "30KM/HR and stay away in the open place"
#print("SPEED RECOMMENDATION : 30KM/HR and stay away in the open place")
#print("Description of weather :",(b["weather"][0]["description"]))
#print("visibility",(b["visibility"]))
        if(visibility<1000):
            RecommendationForVisibilty = "SPEED RECOMMENDATION : 30KM/HR and
SWITCH ON THE HEAD LIGHT"
        else:
            RecommendationForVisibilty = "Visibility range is ideal for vechicles"
#print("SPEED RECOMMENDATION : 30KM/HR and SWITCH ON THE HEAD LIGHT")
        mydata={"temperature":temp,
"TemperatureRecommendation":TemperatureRecommendation,"humidity":humi,"WeatherCond
ition":main,"SpeedRecommendation":SpeedRecommendation
,"DescriptionOfWeather":description,"visibility":visibility,"RecommendationForVis
ibilty":RecommendationForVisibilty,"WindSpeed":Windspeed}
        print(mydata)
        client.publishEvent("Monitor_deviceid","json",mydata)
        client.commandCallback = myCommandCallback

#HOSPITAL,SCHOOL AND PEOPLE CROWDED AREA LIKE RESTAURANT
SIGNS DISPLAYED SPEED RECOMMENDATION ARE PROVIDED(SPRINT
4) - {REQUIREMENT 3 0F THE PROJECT TO DISPLAY HOSPITAL AND
```

SCHOOL REGION BY THE ROAD SAFETY CONTROL OFFICE}
#OPENWEATHER MAP(SPRINT 2)-{REQUIREMENT 1 OF THE PROJECT
TO GET WEATHER DATA}

```
import wiotp.sdk.device  #importing library files for connecting with CLOUD,sdk=software
developement kit
import requests  #for API request
import json  #converting it to json(key:values)
import sys
myConfig = {
    "identity": {
        "orgId": "uaortj",
        "typeId": "Monitor_devicetype",     #configuration wit CLOUD,finding identity
        "deviceId":"Monitor_deviceid"
    },
    "auth": {
        "token": "sngs123monitor"   #authenticating with cloud device
    }
}
```

#TRAFFIC AND FATAL SITUATION ALERT MESSAGE DISPLAYING IN WEB UI
WHWN THE

```
client = wiotp.sdk.device.DeviceClient(config=myConfig, logHandlers=None)     #initialising device client with above myconfig detail
client.connect()
ALERT=""
NOTIFY=""
def myCommandCallback(cmd):
    print("Message received from IBM IoT Platform: %s" % cmd.data['command'])
    m=cmd.data['command']
        #THIS IF COMDITION BLOCK IS FOR TRAFFIC AND FATAL SITUATION ALERT MESSAGE DISPLAYING IN WEB UI WHEN THE MESSAGE WAS RECEIVED FROM THE ROAD SAFETY OFFICE
    ALERT=""
    NOTIFY=""
    if(m=="TRAFFIC"):
        ALERT="TRAFFIC - PLEASE WAIT OR PREFER ANOTHER ROUTE"
        print("*****///PLEASE WAIT OR PREFER ANOTHER ROUTE///*****")
    elif(m=="ACCIDENT"):
        ALERT="ACCIDENT - TAKE DIVERSION"
        print("*****///TAKE DIVERSION///*****")
    elif(m=="MESSAGE"):
        ALERT="HAVE A NICE DAY!"
        print("HAVE A NICE DAY!")
```

```
        #THE BELOW CONDITION BLOCK IS TO DISPLAY HOSPITAL ,SCHOOL, AND RESTAURANT REGIONED AREA AND SPEED RECOMMENDATION
    if(m=="SCHOOL"):
        NOTIFY="SCHOOL REGION MAINTAIN SPEED LIMIT BELOW 40KM/HR"
        print("SCHOOL REGION MAINTAIN SPEED LIMIT BELOW 40KM/HR")
    elif(m=="HOSPITAL"):
        NOTIFY="HOSPITAL REGION DONT USE HORN"
        print("HOSPITAL REGION DONT USE HORN")
    elif(m=="RESTAURANT"):
        NOTIFY="CROWDED AREA PLEASE MAINTAIN SPEED LIMIT"
        print("CROWDED AREA PLEASE MAINTAIN SPEED LIMIT")
    mydata1={}
    if(m=="TRAFFIC" or m=="ACCIDENT" or m=="MESSAGE"):
        mydata1={"SITUATION":ALERT}
    elif(m=="SCHOOL"or m=="HOSPITAL" or m=="RESTAURANT" ):
        mydata1={"CAUTION":NOTIFY}
    client.publishEvent("Monitor_deviceid","json",mydata1)
while True:
    print("==================================")
    AREA = "Chennai,%20IN"
```

```
    weatherData =
requests.get("https://api.openweathermap.org/data/2.5/weather?q=Chennai,IN&appid=b23b5fad
240356d80f95242dcf1d6cad")
    b = weatherData.json()
    temp = b["main"]["temp"]
    humi = b["main"]["humidity"]
    main = b["weather"][0]["main"]      #0th index is taken from the object
    description = b["weather"][0]["description"]
    visibility = b["visibility"]
    Windspeed = b["wind"]["speed"]
    TemperatureRecommendation =""
    SpeedRecommendation = ""
    RecommendationForVisibilty = ""
    #print("Temperature(celcius) :",b["main"]["temp"])
    if (temp>33):
        TemperatureRecommendation="Temperature is higher than ideal value"
        #print("Temperature is higher than ideal value")
    elif (temp<19):
        TemperatureRecommendation="Temperature is lower than ideal value"
        #print("Temperature is lower than ideal value")
    else:
        TemperatureRecommendation="Temperature is ideal"
```

```
    #print("Temperature is ideal ")
#print("Humidity :",b["main"]["humidity"])
#print("WeatherCondition",(b["weather"][0]["main"]))
if (main == "Rain"):
    rain = b["rain"]["1h"]
    SpeedRecommendation = "30KM/HR ,ROAD WILL BE SLIPPERY"
    #print("Rain:",b["rain"]["1h"])
    #print("SPEED RECOMMENDATION : 30KM/HR ,ROAD WILL BE SLIPPERY")
elif (main == "Drizzle"):
    SpeedRecommendation = "30KM/HR"
    #print("SPEED RECOMMENDATION : 30KM/HR")
elif (main == "Mist"):
    SpeedRecommendation = "30KM/HR and switch on the headlight"
    #print("SPEED RECOMMENDATION : 30KM/HR and switch on the Headlight")
elif (main == "Thunderstorm"):
    SpeedRecommendation = "30KM/HR and stay away in the open place"
    #print("SPEED RECOMMENDATION : 30KM/HR and stay away in the open place")
elif (main == "Clouds" or "Haze"):
    SpeedRecommendation = "MAINTAIN NORMAL SPEED LIMIT UPTO 5O KM/HR"
    #print("SPEED RECOMMENDATION : 30KM/HR and stay away in the open place")
#print("Description of weather :",(b["weather"][0]["description"]))
#print("visibility",(b["visibility"]))
```

```
    if (visibility<1000):
        RecommendationForVisibilty = "SPEED RECOMMENDATION : 30KM/HR and
SWITCH ON THE HEAD LIGHT"
    else:
        RecommendationForVisibilty = "visibility range is ideal for vechicles"
    #print("SPEED RECOMMENDATION : 30KM/HR and SWITCH ON THE HEAD LIGHT")
    mydata={"temperature":temp,
"TemperatureRecommendation":TemperatureRecommendation,"humidity":humi,"WeatherCond
ition":main,"SpeedRecommendation":SpeedRecommendation
,"DescriptionOfWeather":description,"visibility":visibility,"RecommendationForVisibilty":Reco
mmendationForVisibilty,"WindSpeed":Windspeed,"LOCATION":AREA}
    print(mydata)
    client.publishEvent("Monitor_deviceid","json",mydata)
    client.commandCallback = myCommandCallback
```

GITHUB LINK:

https://github.com/IBM-EPBL/IBM-Project-50644-1660920158

DEMO LINK:

https://drive.google.com/file/d/1qS18IptmSY6axM62SnX6VuI-X1FOQgiR/view?usp=drivesdk