DROWSINESS DETECTION AND ALERTING SYSTEM

NAANMUDHALVAN PROJECT BASED LEARNING

ON

PROFESSIONAL READINESS FOR INNOVATION, EMPLOYABILITY AND ENTERPRENEURSHIP

A PROJECT REPORT

Submitted by

A.K. VIGNESH

R. VIJAYAKUMAR

A. GOKULAKANNAN

K. BRUNDHA

BACHELOR OF ENGINEERING

IN

ELECTRONICS AND COMMUNICATION ENGINEERING

UNIVERSITY COLLEGE OF ENGINEERING, RAMANATHAPURAM

ANNA UNIVRSITY: CHENNAI 600 025

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A.K. VIGNESH	**(9080846681)**
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BONAFIDE CERTIFICATE

Certified that this project report titled "Drowsiness Detection And Alerting System by **NAANMUDHALVAN PROJECT BASED LEARNING** Program", is the Bonafide work of **VIGNESH A.K** (9080846681), **VIJAYAKUMAR. R** (8825722976) , **GOKULAKANNAN. A** (9150152227), **BRUNDHA .K** (9080172584) who carried out the work under faculty mentor and industry mentor supervision, for the partialfulfillment of the requirements for the award of the degree of **BACHELOR OF ENGINEERING IN ELECTRONICS AND COMMUNICATION ENGINEERING.**

Certified further that to the best of my knowledge and belief, the work reported here in does not form part of any other thesis or dissertation on the basis of which a degree or an award was conferred on a nearlier occasion.

DECLARATION

I, hereby declare that the Project work entitled **"DROWSINESS DETECTION AND ALERTING System by NAANMUDHALVAN PROJECT BASED LEARNING PROGRAM"** submitted to the IBM November 2022 in partial fulfilment for the award of the degree of **BACHELOR OF ENGINEERING IN ELECTRONICS AND COMMUNICATION ENGINEERING,** is the report of the original project work done by us under the guidance of Mr. (Faculty Mentor),Department of **ELECTRONICS AND COMMUNICATION ENGINEERING**, University College of Engineering, Ramanathapuram.

NAME

A.K. VIGNESH

(Team Leader)

I certify that the declaration made by the above candidate is true.

SIGNATURE FACULTY MENTOR
Department of Electronics and
Communication Engineering
University College of Engineering
Ramanathapuram-623 513

TABLE OF CONTENTS

1. INTRODUCTION

1.1 Project overview:

Drowsiness detection is a car safety technology which helps prevent accidents caused by the driver getting drowsy. Various studies have suggested that around 20% of all road accidents are fatigue-related, up to 50% on certain roads. Some of the current systems learn driver patterns and can detect when a driver is becoming drowsy. The system can be made more accurate using various other parameters such as State of the Car, Detecting Foreign Substances on Face etc. an application can be developed where it can alert or prevent the user from sleeping.

Drowsiness detection is a safety technology that can prevent accidents that are caused by drivers who fell asleep while driving. The objective of this intermediate Python project is to build a drowsiness detection system that will detect that a person's eyes are closed for a few seconds. This system will alert the driver when drowsiness is detected.

In this Python project, we will be using OpenCV for gathering the images from webcam and feed them into Deep Learning model which will classify whether the person's eyes are 'Open' or 'Closed'.

1.2 PURPOSE:

The purpose of the drowsiness detection system is to aid in the prevention of accidents passenger and commercial vehicles. The system will detect the early symptoms of drowsiness before the driver has fully lost all attentiveness and warn the driver that they are no longer capable of operating the vehicle safely. This device will not, however, guarantee that the driver will be fully awakened and that an accident will be avoided. It is simply a tool for improving driver safety; focusing primarily on long-haul truck drivers, night-time drivers, people driving long distances alone or people suffering from sleep deprivation.

Drowsiness is a serious concern when driving and can cause accidents because it impairs the elements of human performance that are critical to safe driving: slower reaction time, reduced vigilance, deficits in information processing.

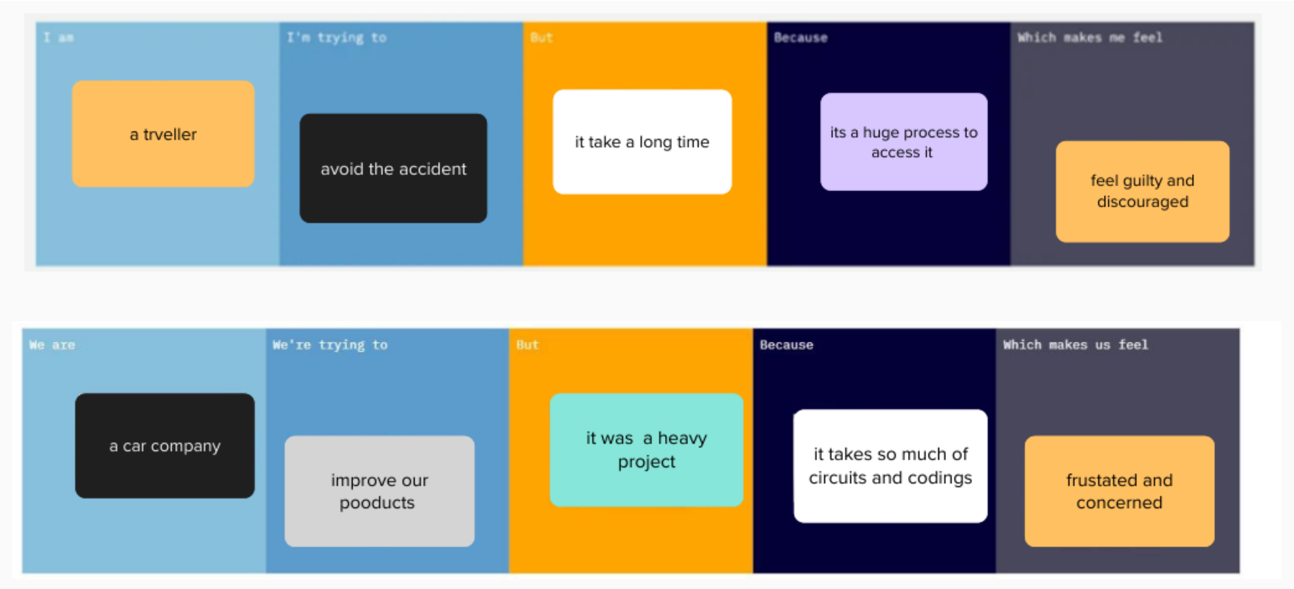
2. IDEATION & PROPOSED SOLUTION

2.1 PROBLEM STATEMENT DEFINITION:

Customer problem statement:

Drowsy driving is responsible for one out of every four car accidents. Driving while drowsy is a dangerous combination of driving and tiredness. The most terrifying aspect is that drowsy driving isn’t merely falling asleep behind the wheel. When a driver is not paying full attention to the road, drowsy driving can be as simple as a momentary episode of unconsciousness. Because of the importance of this issue, we believe it is critical to develop a drowsiness detection system, particularly in the early phases, in order to avoid accidents. Our approach to this problem is to create a detection system that recognizes key drowsiness characteristics and sends out an alert before it’s too late.

Customer problem statement in a visualized way:



I am	I'm trying to	But	Because	Which makes me feel
a trveller	avoid the accident	it take a long time	its a huge process to access it	feel guilty and discouraged

We are	We're trying to	But	Because	Which makes us feel
a car company	improve our pooducts	it was a heavy project	it takes so much of circuits and codings	frustated and concerned

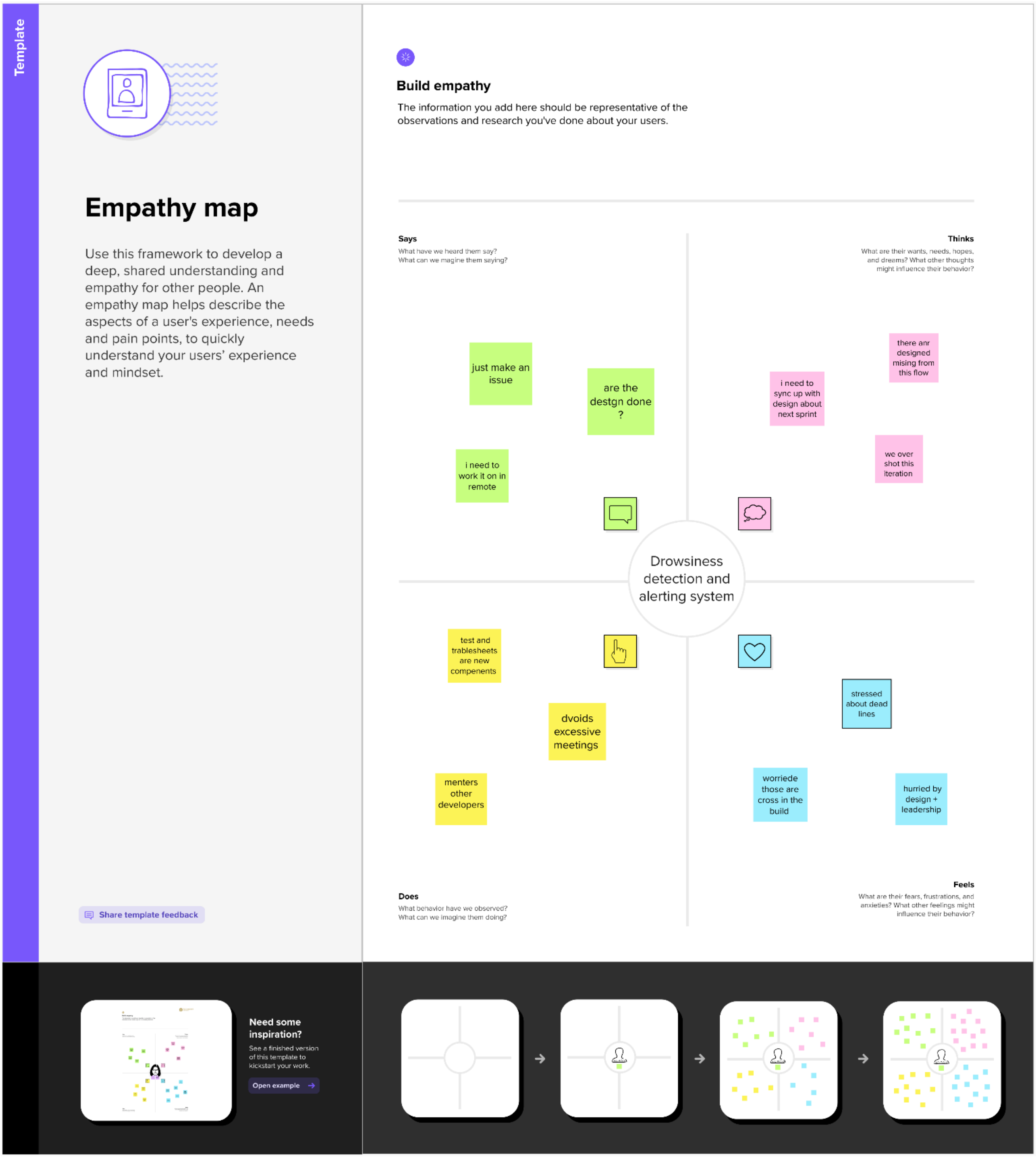
2.2 Empathy Map Canvas:

An empathy map is a simple, easy-to-digest visual that captures knowledge about a user’s behaviours and attitudes.

It is a useful tool to helps teams better understand their users.

Creating an effective solution requires understanding the true problem and the person who is experiencing it. The exercise of creating the map helps participants consider things from the user’s perspective along with his or her goals and challenges.

An empathy map is a collaborative tool teams can use to gain a deeper insight into their customers. Much like a user persona, an empathy map can represent a group of users, such as a customer segment. The empathy map was originally created by Dave Gray and has gained much popularity within the agile community.



Template

Empathy map

Use this framework to develop a deep, shared understanding and empathy for other people. An empathy map helps describe the aspects of a user's experience, needs and pain points, to quickly understand your users' experience and mindset.

Share template feedback

Build empathy

The information you add here should be representative of the observations and research you've done about your users.

Says

What have we heard them say?
What can we magine them saying?

just make an issue

are the destgn done ?

i need to work it on in remote

Thinks

What are their wants, needs, hopes, and dreams? What other thoughts might influence their behavior?

there anr designed mising from this flow

i need to sync up with design about next sprint

we over shot this iteration

Drowsiness detection and alerting system

test and trablesheets are new compenents

dvoids excessive meetings

menters other developers

Does

What behavior have we observed?
What can we imagine them doing?

stressed about dead lines

worriede those are cross in the build

hurried by design + leadership

Feels

What are their fears, frustrations, and anxieties? What other feelings might influence their behavior?

Need some inspiration?

See a finished version of this template to kickstart your work.

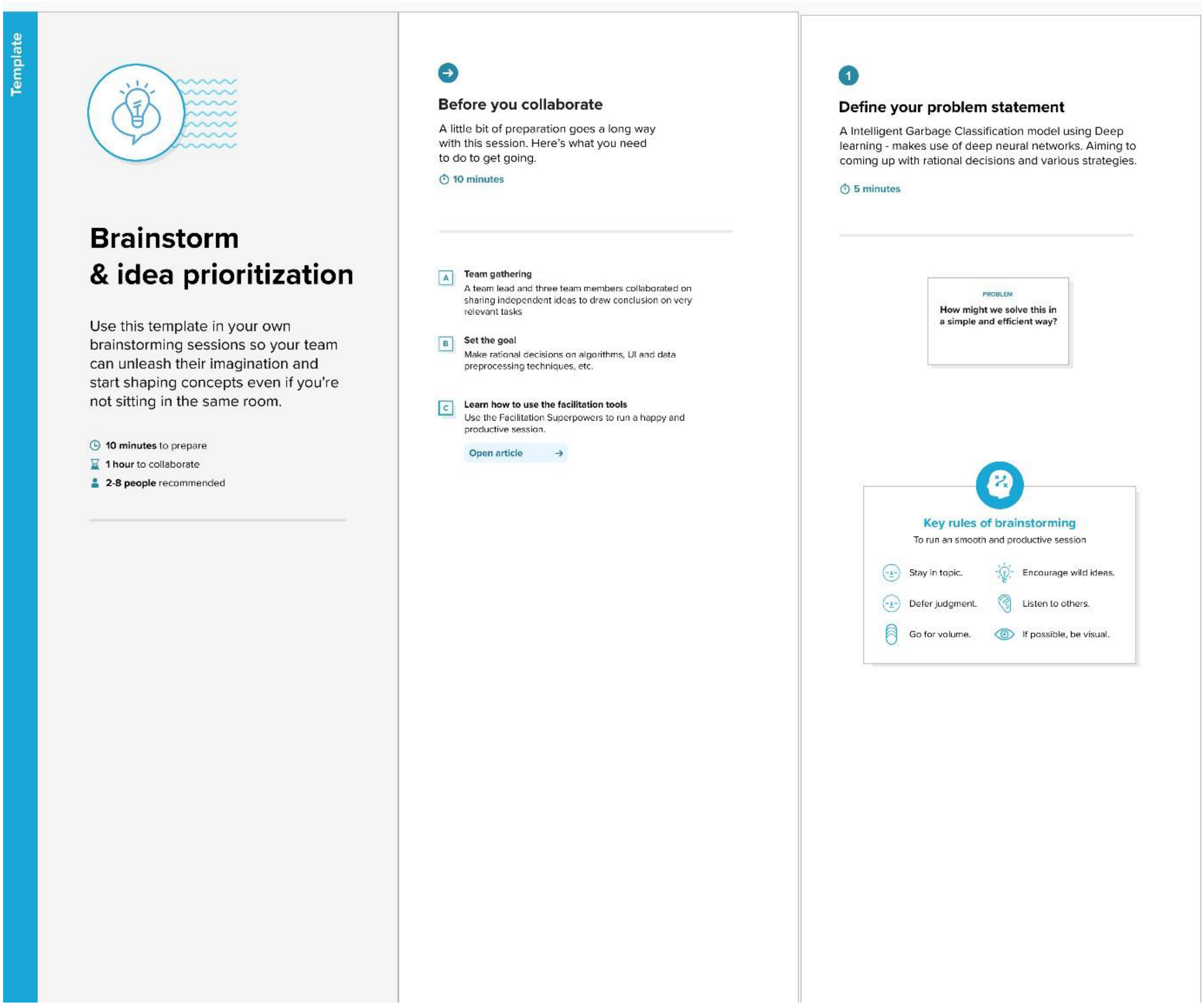
Open example →

2.3 Ideation & Brainstorming

Brainstorm & Idea Prioritization:

Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich amount of creative solutions.

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.



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**
A team lead and three team members collaborated on sharing independent ideas to draw conclusion on very relevant tasks

B **Set the goal**
Make rational decisions on algorithms, UI and data preprocessing techniques, etc.

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

1 Define your problem statement

A Intelligent Garbage Classification model using Deep learning - makes use of deep neural networks. Aiming to coming up with rational decisions and various strategies.

5 minutes

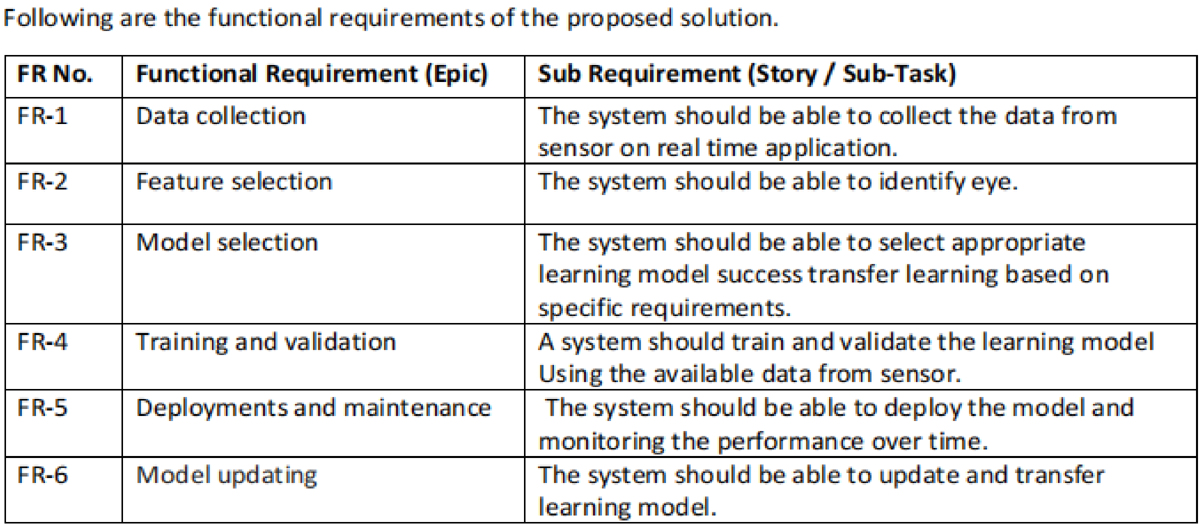
PROBLEM
How might we solve this in a simple and efficient way?

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.

3. REQUIREMENT ANALYSIS

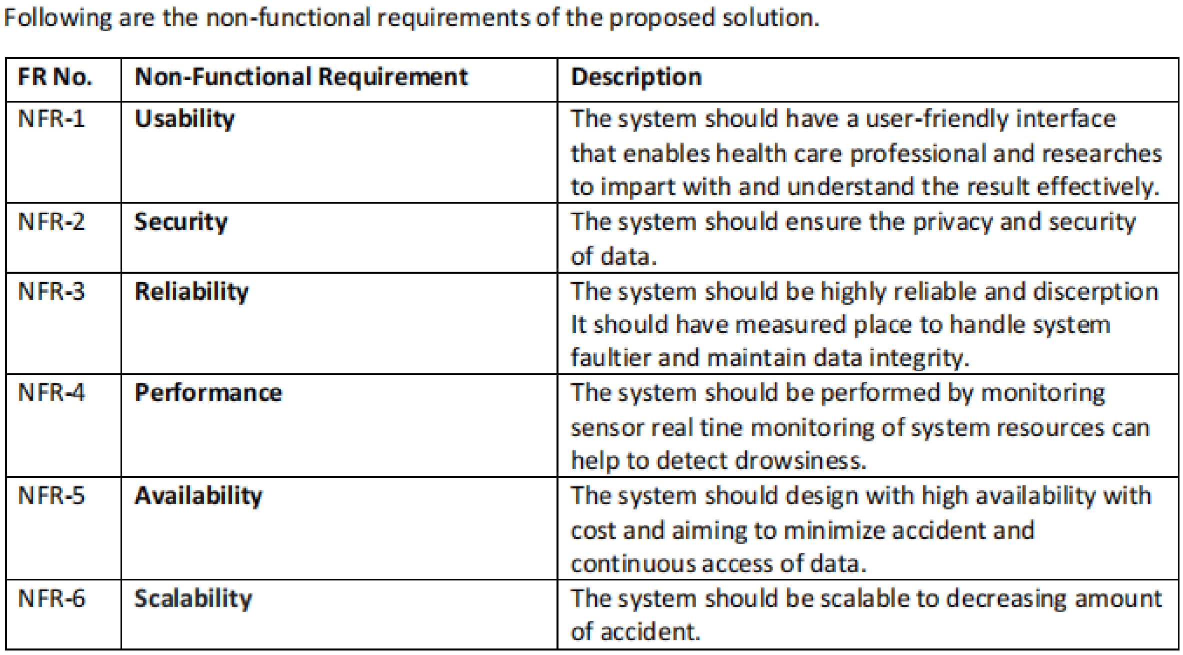
3.1 FUNCTIONAL REQUIREMENTS



Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Data collection	The system should be able to collect the data from sensor on real time application.
FR-2	Feature selection	The system should be able to identify eye.
FR-3	Model selection	The system should be able to select appropriate learning model success transfer learning based on specific requirements.
FR-4	Training and validation	A system should train and validate the learning model Using the available data from sensor.
FR-5	Deployments and maintenance	The system should be able to deploy the model and monitoring the performance over time.
FR-6	Model updating	The system should be able to update and transfer learning model.

3.2 NON-FUNCTIONAL REQUIREMENTS



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

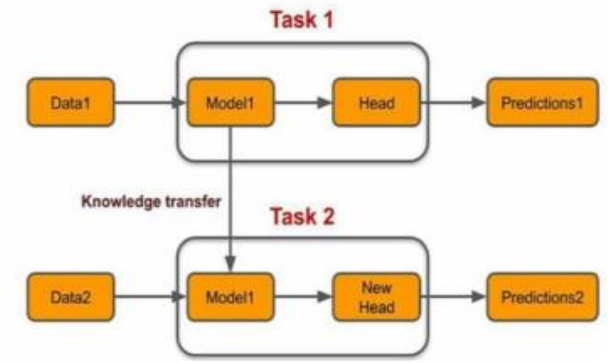
FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	The system should have a user-friendly interface that enables health care professional and researches to impart with and understand the result effectively.
NFR-2	**Security**	The system should ensure the privacy and security of data.
NFR-3	**Reliability**	The system should be highly reliable and discerption It should have measured place to handle system faultier and maintain data integrity.
NFR-4	**Performance**	The system should be performed by monitoring sensor real tine monitoring of system resources can help to detect drowsiness.
NFR-5	**Availability**	The system should design with high availability with cost and aiming to minimize accident and continuous access of data.
NFR-6	**Scalability**	The system should be scalable to decreasing amount of accident.

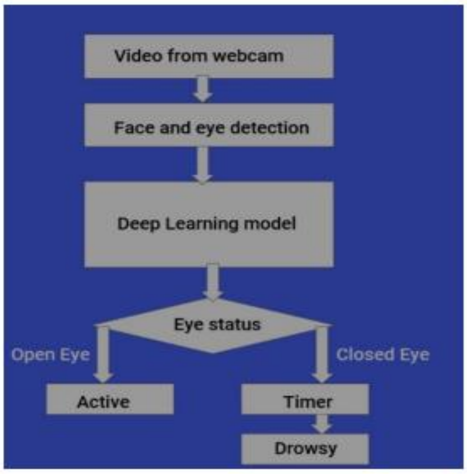
4. PROJECT DESIGN

4.1 Data Flow Diagram

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.

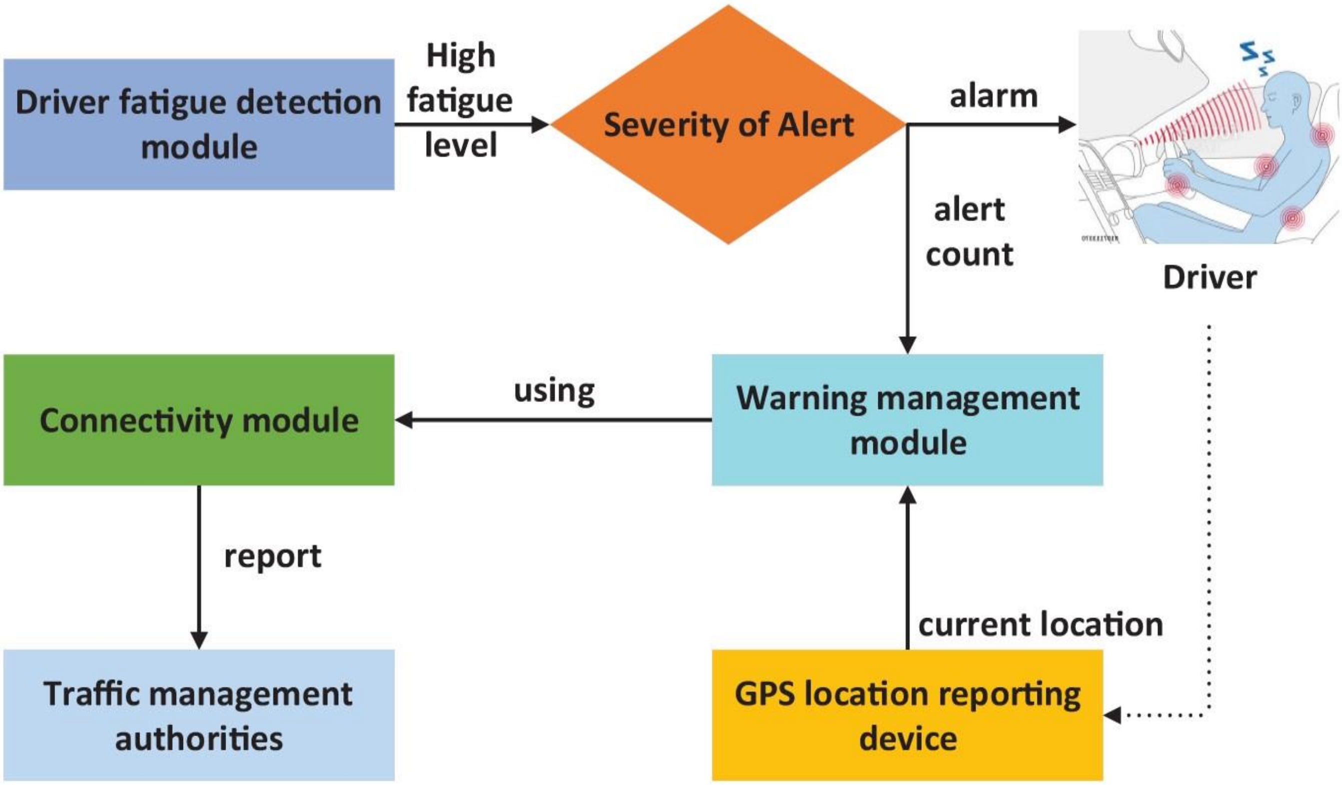
ed.





4.2 Solution & Technical Architecture

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


Driver fatigue detection module
High fatigue level
Severity of Alert
alarm
Driver
alert count
Warning management module
using
Connectivity module
report
Traffic management authorities
current location
GPS location reporting device

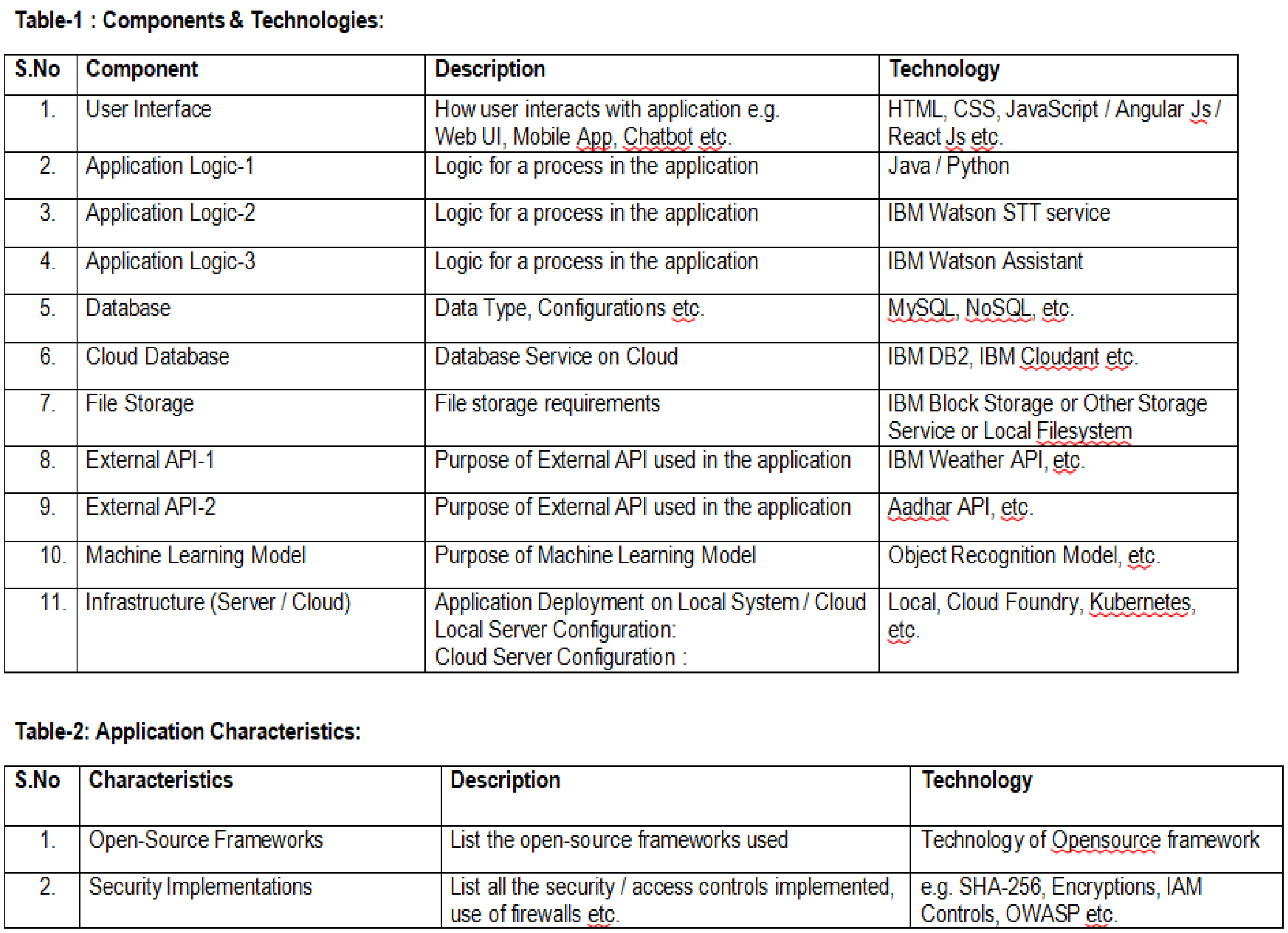
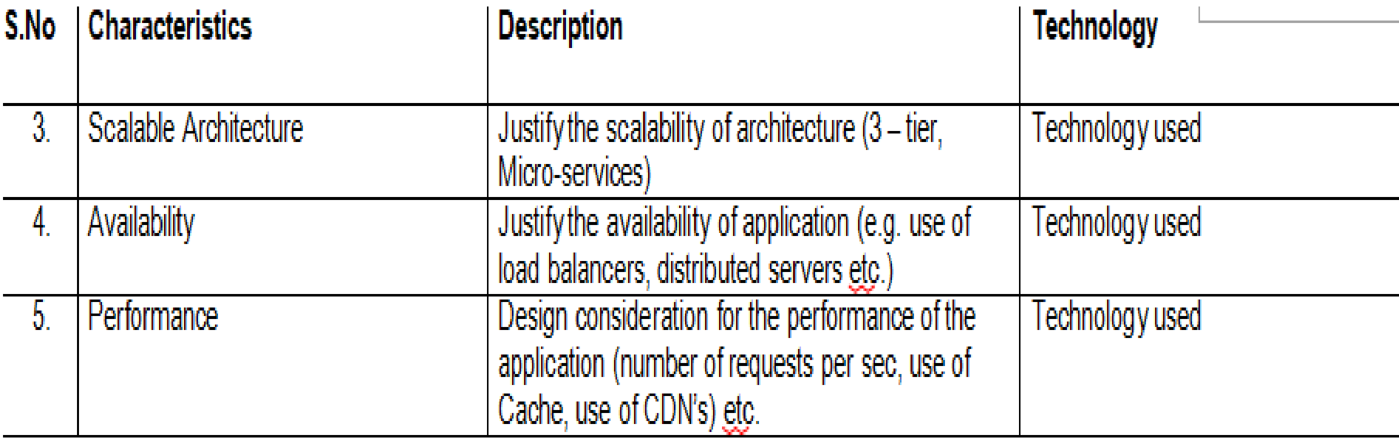


Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	How user interacts with application e.g. Web UI, Mobile App, Chatbot etc.	HTML, CSS, JavaScript / Angular Js / React Js etc.
2.	Application Logic-1	Logic for a process in the application	Java / Python
3.	Application Logic-2	Logic for a process in the application	IBM Watson STT service
4.	Application Logic-3	Logic for a process in the application	IBM Watson Assistant
5.	Database	Data Type, Configurations etc.	MySQL, NoSQL, etc.
6.	Cloud Database	Database Service on Cloud	IBM DB2, IBM Cloudant etc.
7.	File Storage	File storage requirements	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API-1	Purpose of External API used in the application	IBM Weather API, etc.
9.	External API-2	Purpose of External API used in the application	Aadhar API, etc.
10.	Machine Learning Model	Purpose of Machine Learning Model	Object Recognition Model, etc.
11.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: Cloud Server Configuration :	Local, Cloud Foundry, Kubernetes, etc.

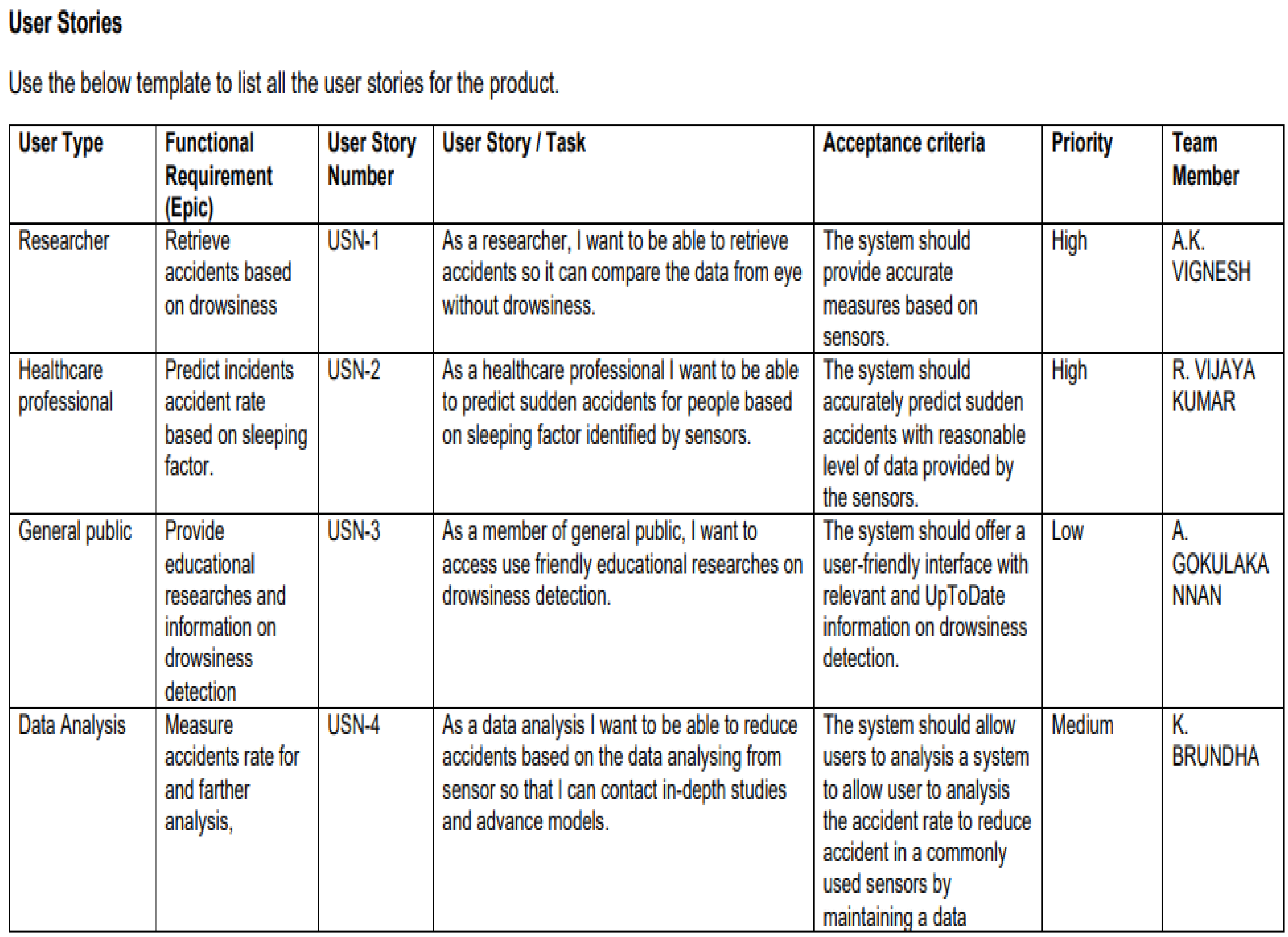
Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source frameworks used	Technology of Opensource framework
2.	Security Implementations	List all the security / access controls implemented, use of firewalls etc.	e.g. SHA-256, Encryptions, IAM Controls, OWASP etc.



S.No	Characteristics	Description	Technology
3.	Scalable Architecture	Justify the scalability of architecture (3 – tier, Micro-services)	Technology used
4.	Availability	Justify the availability of application (e.g. use of load balancers, distributed servers etc.)	Technology used
5.	Performance	Design consideration for the performance of the application (number of requests per sec, use of Cache, use of CDN's) etc.	Technology used

4.3 User Stories



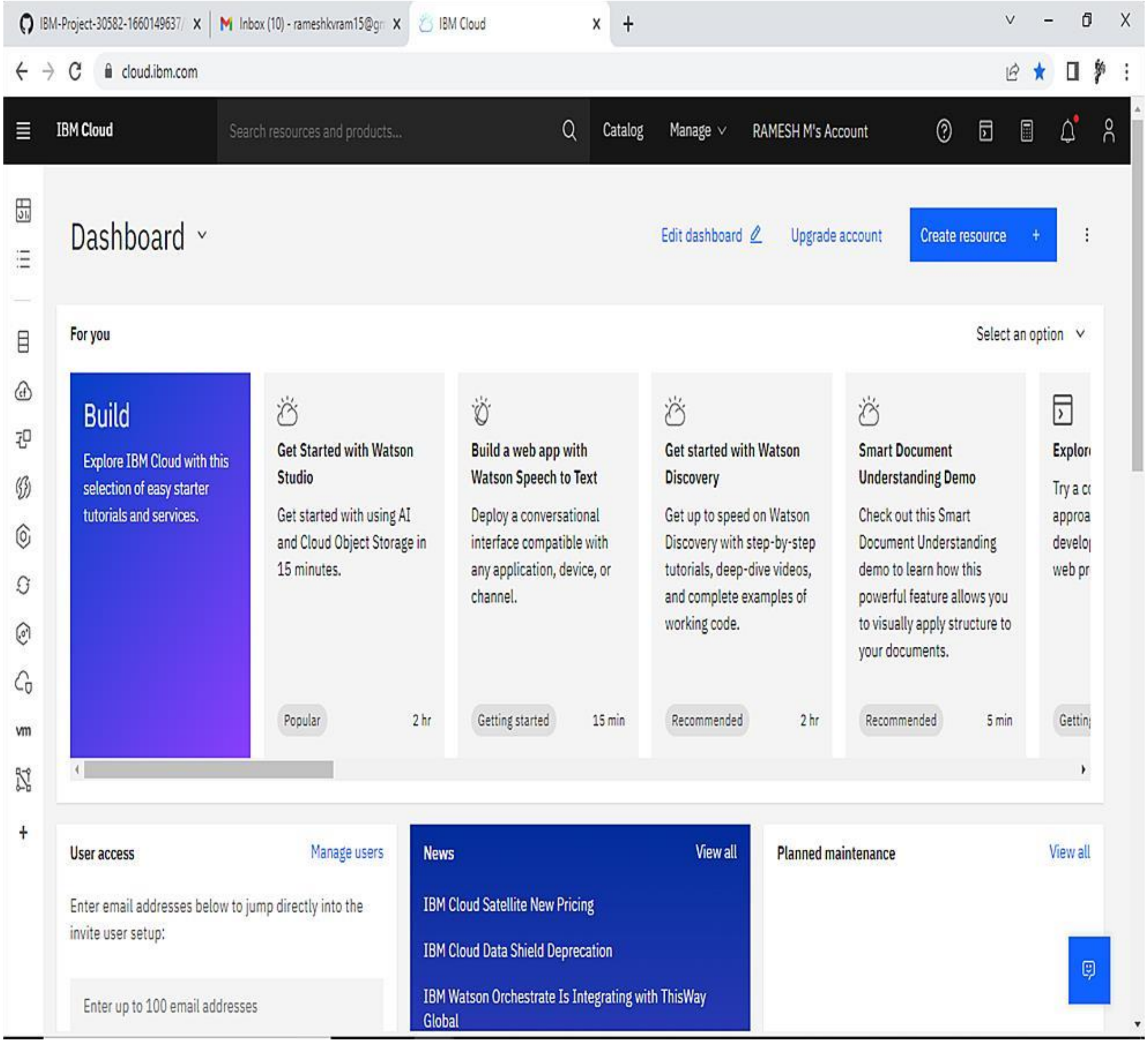
User Stories

Use the below template to list all the user stories for the product.

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Team Member
Researcher	Retrieve accidents based on drowsiness	USN-1	As a researcher, I want to be able to retrieve accidents so it can compare the data from eye without drowsiness.	The system should provide accurate measures based on sensors.	High	A.K. VIGNESH
Healthcare professional	Predict incidents accident rate based on sleeping factor.	USN-2	As a healthcare professional I want to be able to predict sudden accidents for people based on sleeping factor identified by sensors.	The system should accurately predict sudden accidents with reasonable level of data provided by the sensors.	High	R. VIJAYA KUMAR
General public	Provide educational researches and information on drowsiness detection	USN-3	As a member of general public, I want to access use friendly educational researches on drowsiness detection.	The system should offer a user-friendly interface with relevant and UpToDate information on drowsiness detection.	Low	A. GOKULAKANNAN
Data Analysis	Measure accidents rate for and farther analysis,	USN-4	As a data analysis I want to be able to reduce accidents based on the data analysing from sensor so that I can contact in-depth studies and advance models.	The system should allow users to analysis a system to allow user to analysis the accident rate to reduce accident in a commonly used sensors by maintaining a data	Medium	K. BRUNDHA

PROJECT PLANING :

1.User, I will register in ICTA academyand create IBM cloud account.



Build

Explore IBM Cloud with this selection of easy starter tutorials and services.

Get Started with Watson Studio

Get started with using AI and Cloud Object Storage in 15 minutes.

Popular 2 hr

Build a web app with Watson Speech to Text

Deploy a conversational interface compatible with any application, device, or channel.

Getting started 15 min

Get started with Watson Discovery

Get up to speed on Watson Discovery with step-by-step tutorials, deep-dive videos, and complete examples of working code.

Recommended 2 hr

Smart Document Understanding Demo

Check out this Smart Document Understanding demo to learn how this powerful feature allows you to visually apply structure to your documents.

Recommended 5 min

Explor

Try a c approa develo web pr

Gettin

User access Manage users

Enter email addresses below to jump directly into the invite user setup:

Enter up to 100 email addresses

News View all

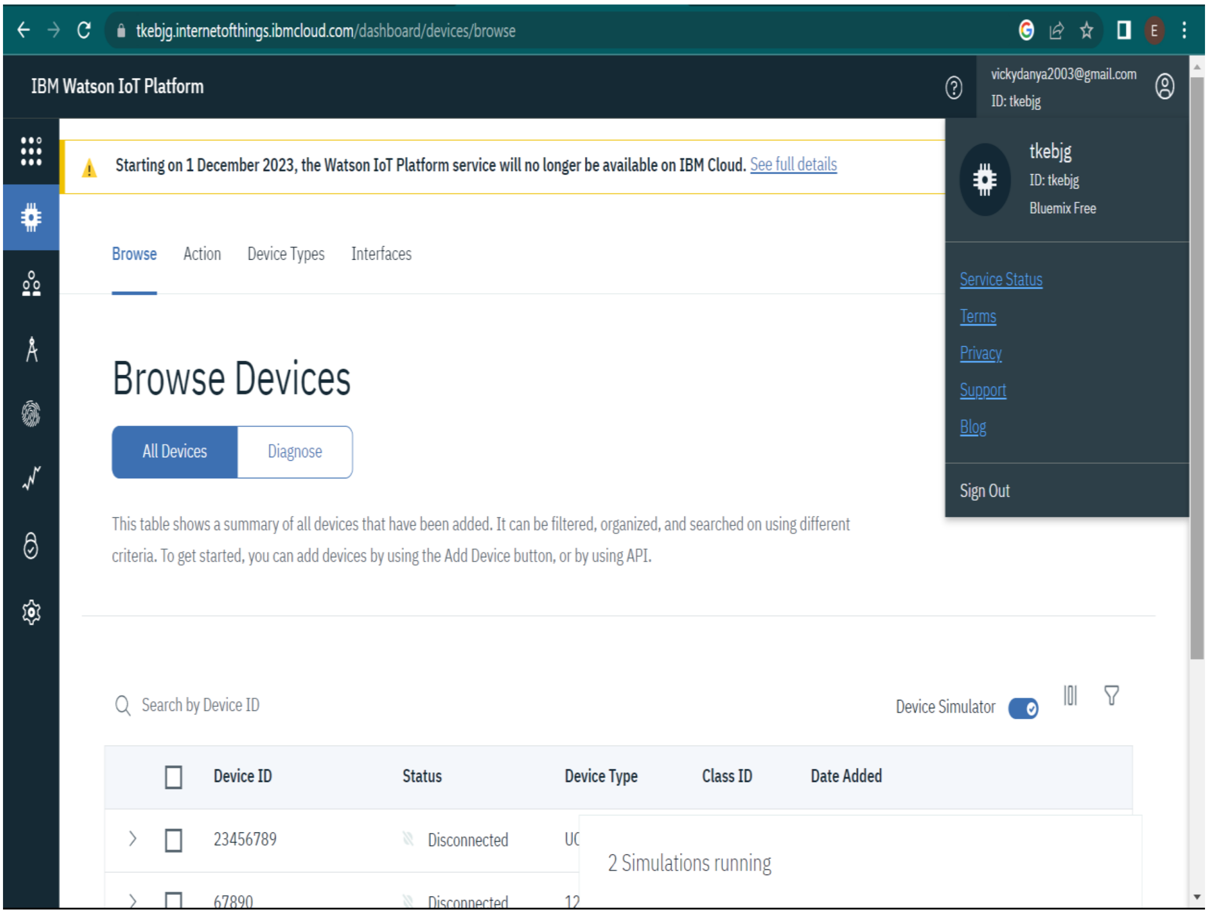
IBM Cloud Satellite New Pricing

IBM Cloud Data Shield Deprecation

IBM Watson Orchestrate Is Integrating with ThisWay Global

Planned maintenance View all

2.As a user, I will access IBM cloud and launch the IBM Watson IOT platform



tkebjg.internetofthings.ibmcloud.com/dashboard/devices/browse

IBM Watson IoT Platform

vickydanya2003@gmail.com
ID: tkebjg

Starting on 1 December 2023, the Watson IoT Platform service will no longer be available on IBM Cloud. See full details

tkebjg
ID: tkebjg
Bluemix Free

Service Status
Terms
Privacy
Support
Blog

Sign Out

Browse | Action | Device Types | Interfaces

Browse Devices

All Devices | Diagnose

This table shows a summary of all devices that have been added. It can be filtered, organized, and searched on using different criteria. To get started, you can add devices by using the Add Device button, or by using API.

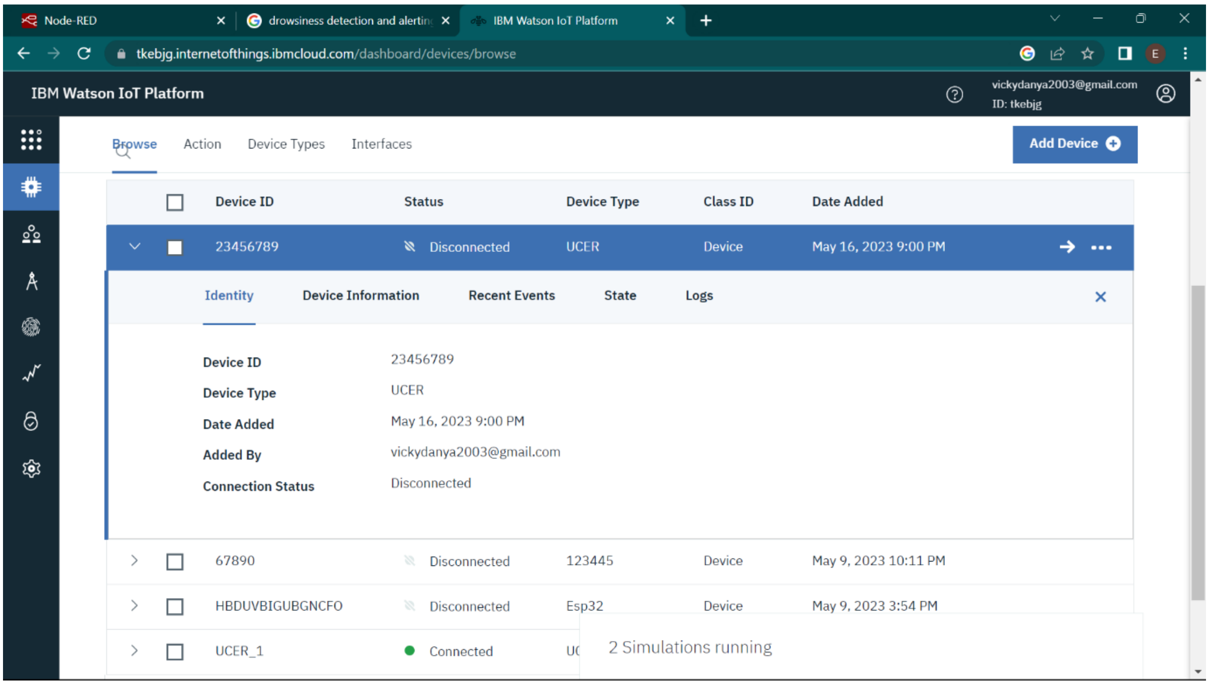
Search by Device ID

Device Simulator

	Device ID	Status	Device Type	Class ID	Date Added
□	23456789	Disconnected	UC		
□	67890	Disconnected	12		

2 Simulations running

3.As a user, I can create a device in the IOT IBM Watson platform for simulation

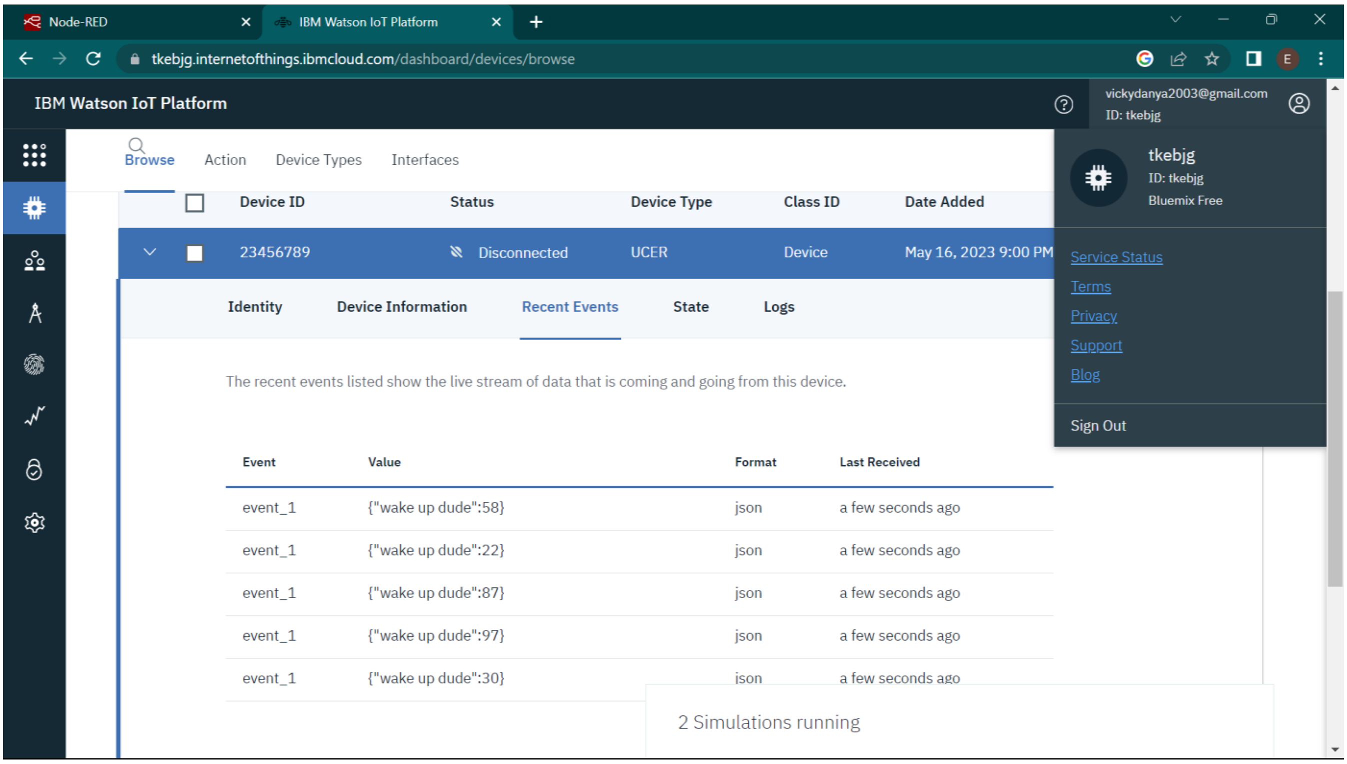


	Device ID	Status	Device Type	Class ID	Date Added
□	23456789	Disconnected	UCER	Device	May 16, 2023 9:00 PM
□	67890	Disconnected	123445	Device	May 9, 2023 10:11 PM
□	HBDUVBIGUBGNCFO	Disconnected	Esp32	Device	May 9, 2023 3:54 PM
□	UCER_1	● Connected	UC		

Device ID 23456789
Device Type UCER
Date Added May 16, 2023 9:00 PM
Added By vickydanya2003@gmail.com
Connection Status Disconnected

2 Simulations running

4. As a get the wakeup message , I can create a line chart with my output data



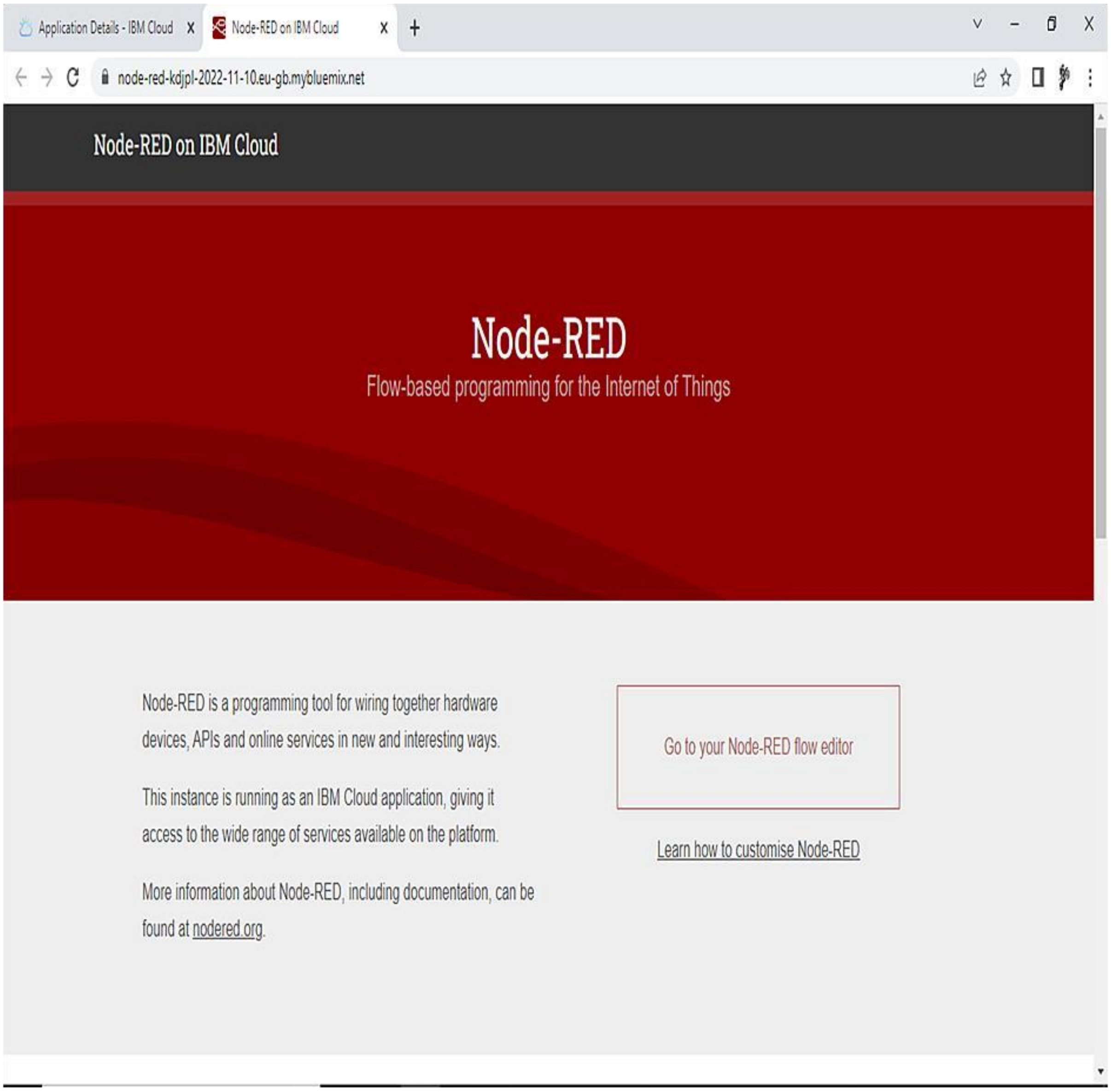
□	Device ID	Status	Device Type	Class ID	Date Added
□	23456789	Disconnected	UCER	Device	May 16, 2023 9:00 PM

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
event_1	{"wake up dude":58}	json	a few seconds ago
event_1	{"wake up dude":22}	json	a few seconds ago
event_1	{"wake up dude":87}	json	a few seconds ago
event_1	{"wake up dude":97}	json	a few seconds ago
event_1	{"wake up dude":30}	json	a few seconds ago

2 Simulations running

5.As a user, I can create NODE RED by app deployment


Application Details - IBM Cloud
Node-RED on IBM Cloud
node-red-kdjpl-2022-11-10.eu-gb.mybluemix.net

Node-RED on IBM Cloud

Node-RED

Flow-based programming for the Internet of Things

Node-RED is a programming tool for wiring together hardware devices, APIs and online services in new and interesting ways.

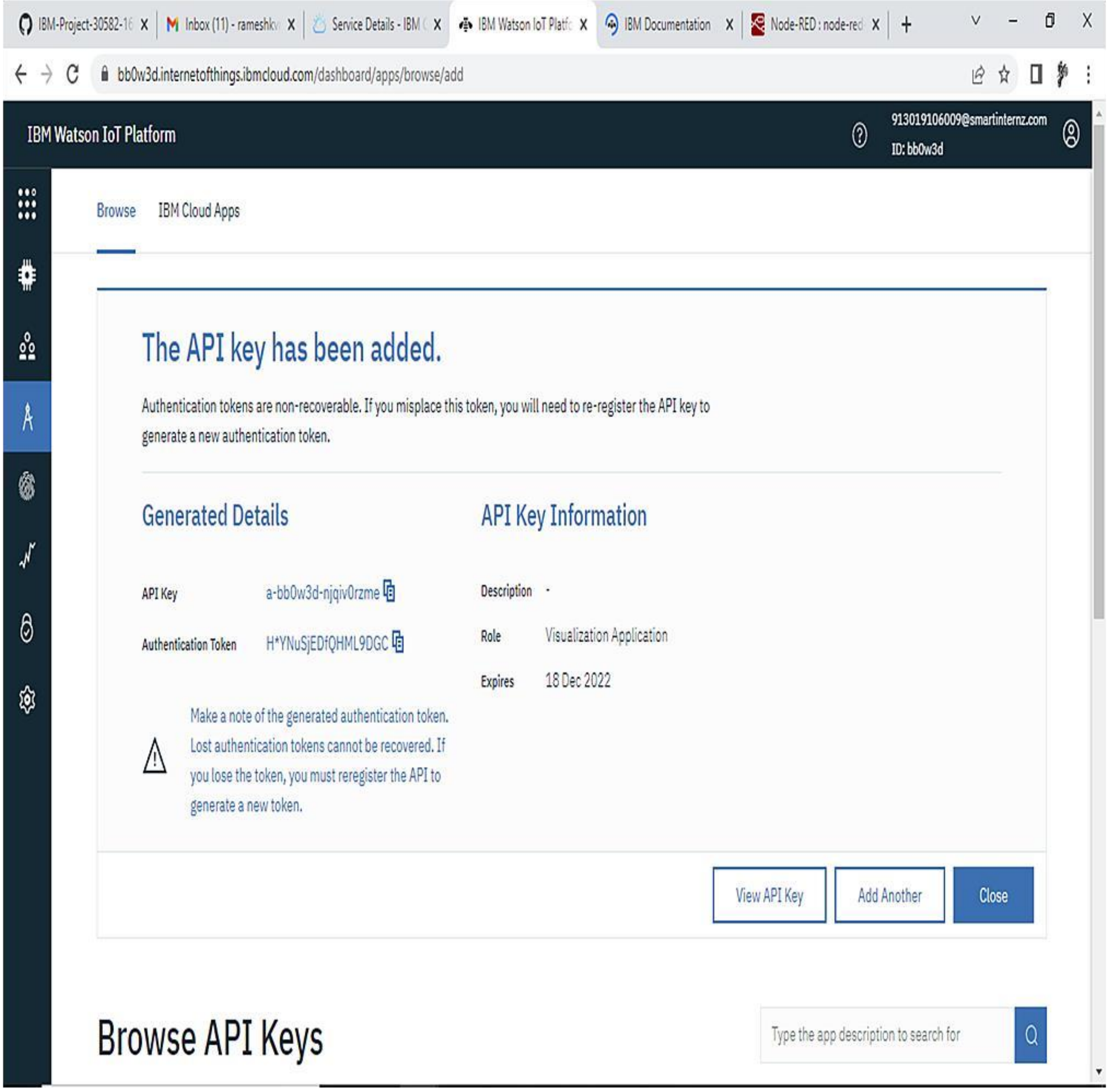
This instance is running as an IBM Cloud application, giving it access to the wide range of services available on the platform.

More information about Node-RED, including documentation, can be found at nodered.org.

Go to your Node-RED flow editor

Learn how to customise Node-RED

6.get the API key through IBM Watson platform



The API key has been added.

Authentication tokens are non-recoverable. If you misplace this token, you will need to re-register the API key to generate a new authentication token.

Generated Details

API Key	a-bb0w3d-njqiv0rzme
Authentication Token	H*YNuSjEDfQHML9DGC

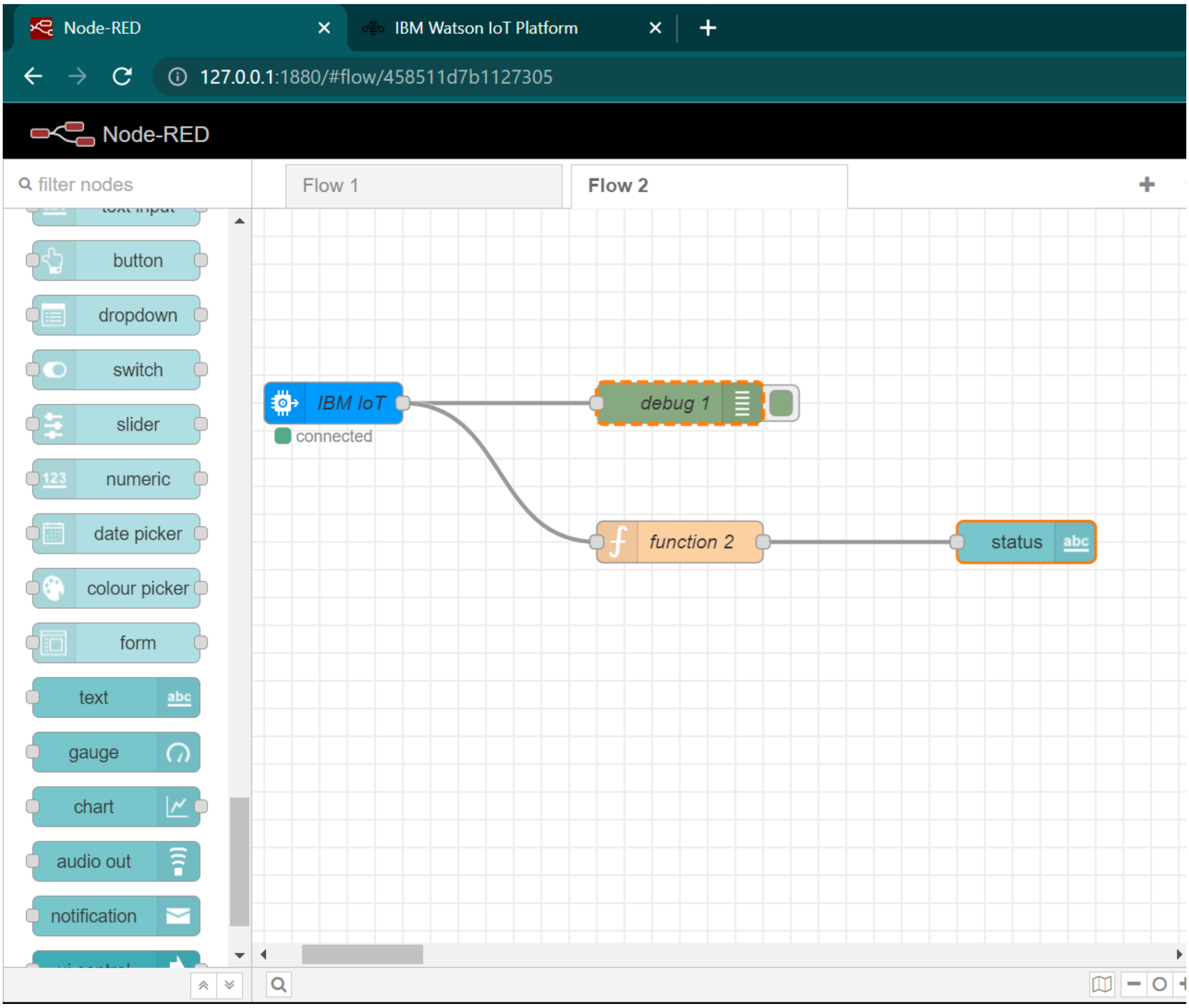
⚠ Make a note of the generated authentication token. Lost authentication tokens cannot be recovered. If you lose the token, you must reregister the API to generate a new token.

API Key Information

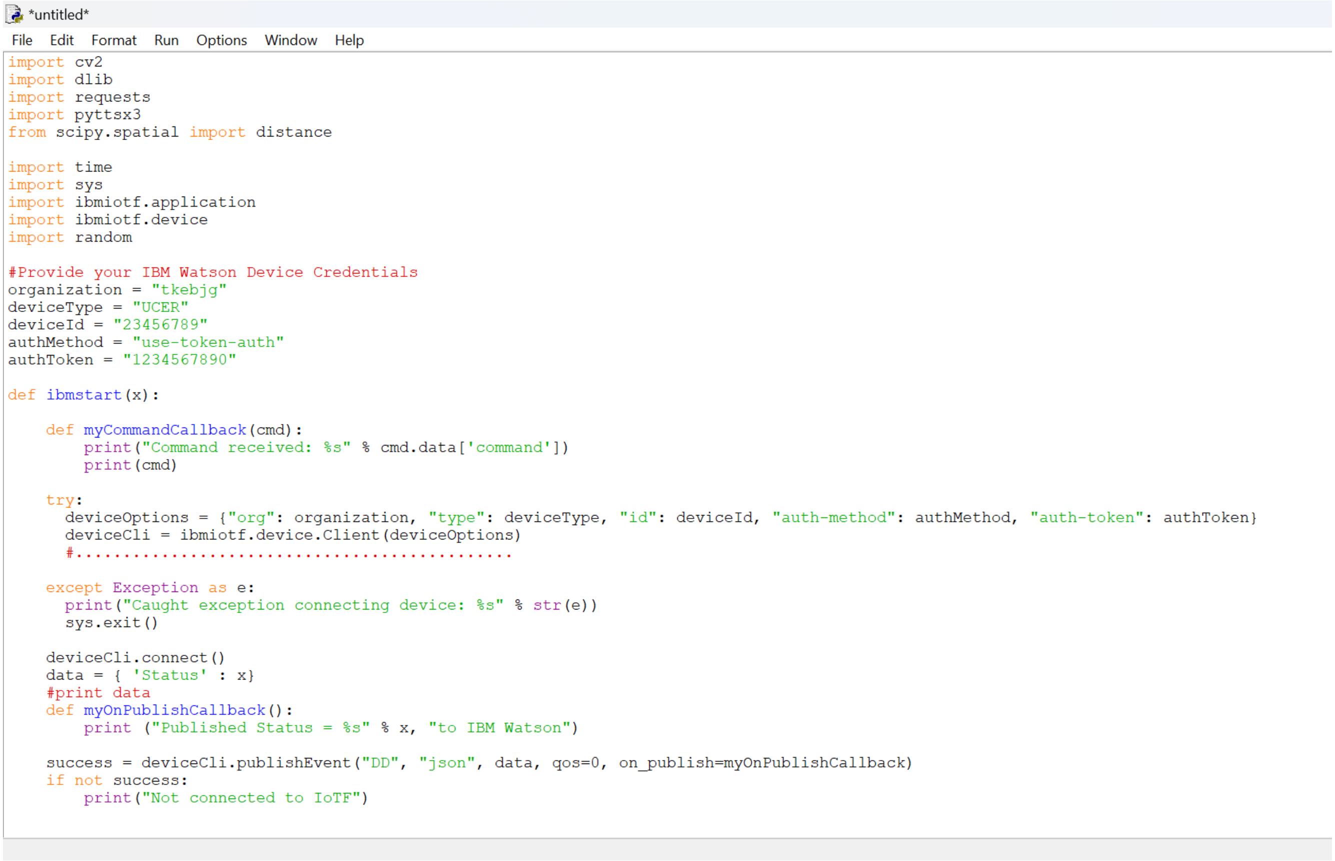
Description	-
Role	Visualization Application
Expires	18 Dec 2022

Browse API Keys

7.As a user, I can design the flow in NODE RED

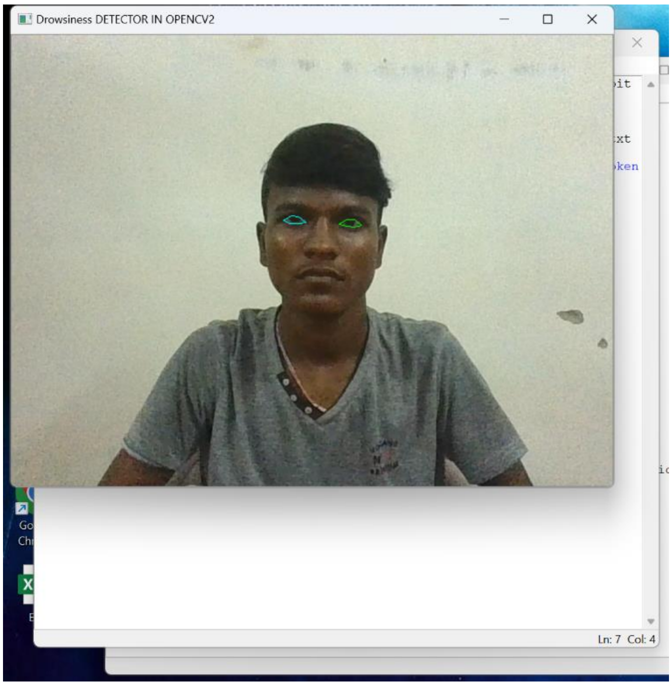


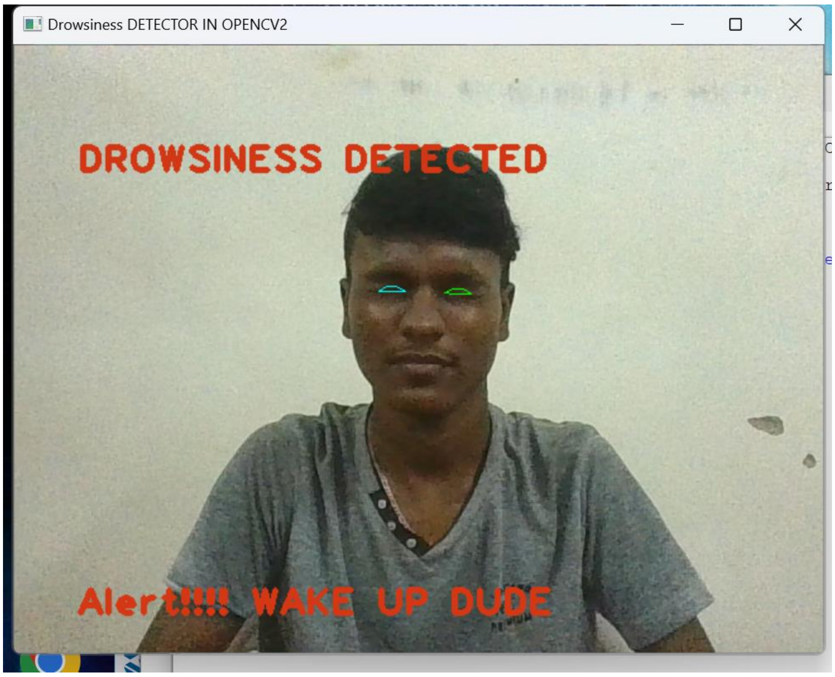
8. As a user, develop the python script



```python
import cv2
import dlib
import requests
import pyttsx3
from scipy.spatial import distance

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

#Provide your IBM Watson Device Credentials
organization = "tkebjg"
deviceType = "UCER"
deviceId = "23456789"
authMethod = "use-token-auth"
authToken = "1234567890"

def ibmstart(x):

    def myCommandCallback(cmd):
        print("Command received: %s" % cmd.data['command'])
        print(cmd)

    try:
      deviceOptions = {"org": organization, "type": deviceType, "id": deviceId, "auth-method": authMethod, "auth-token": authToken}
      deviceCli = ibmiotf.device.Client(deviceOptions)
      #..............................................

    except Exception as e:
      print("Caught exception connecting device: %s" % str(e))
      sys.exit()

    deviceCli.connect()
    data = { 'Status' : x}
    #print data
    def myOnPublishCallback():
        print ("Published Status = %s" % x, "to IBM Watson")

    success = deviceCli.publishEvent("DD", "json", data, qos=0, on_publish=myOnPublishCallback)
    if not success:
        print("Not connected to IoTF")
```

9. get the output of the program with the eye detection

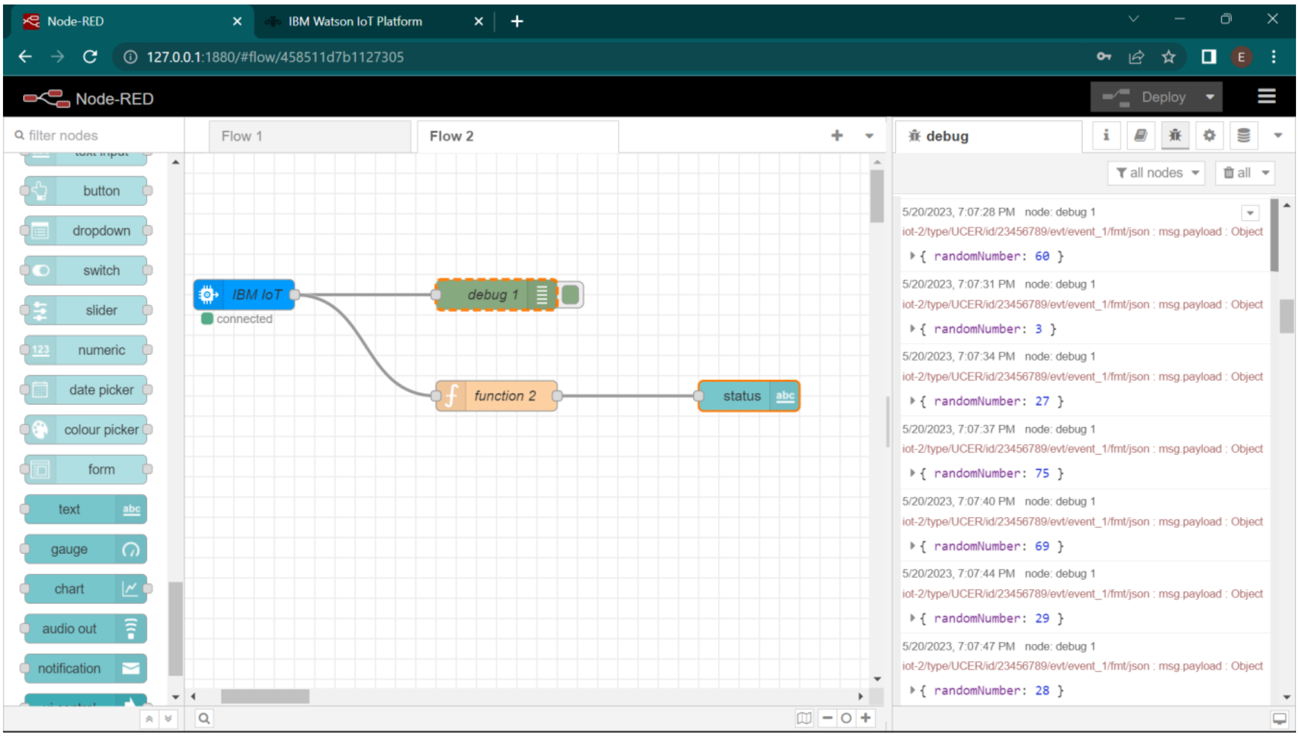




DROWSINESS DETECTED

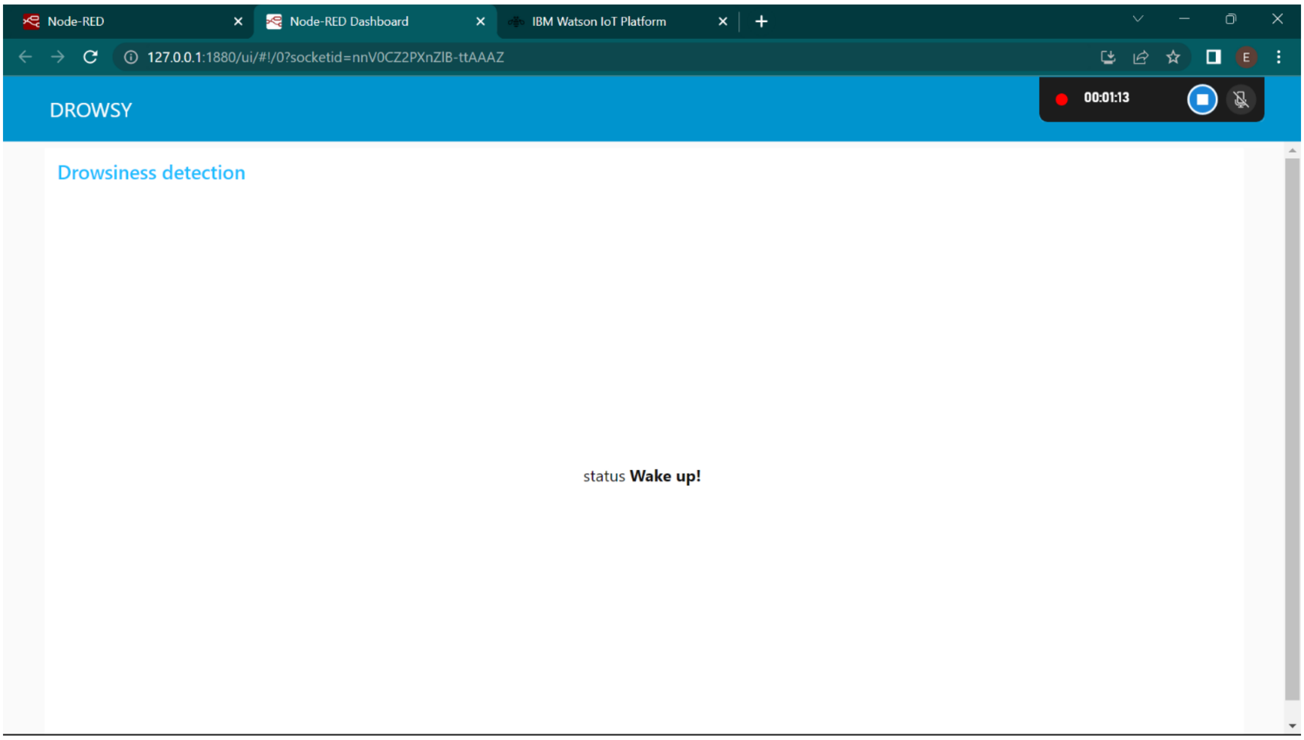
Alert!!!! WAKE UP DUDE

10. As a user, I can check whether I can get the values of the



```
5/20/2023, 7:07:28 PM   node: debug 1
iot-2/type/UCER/id/23456789/evt/event_1/fmt/json : msg.payload : Object
▸{ randomNumber: 60 }
5/20/2023, 7:07:31 PM   node: debug 1
iot-2/type/UCER/id/23456789/evt/event_1/fmt/json : msg.payload : Object
▸{ randomNumber: 3 }
5/20/2023, 7:07:34 PM   node: debug 1
iot-2/type/UCER/id/23456789/evt/event_1/fmt/json : msg.payload : Object
▸{ randomNumber: 27 }
5/20/2023, 7:07:37 PM   node: debug 1
iot-2/type/UCER/id/23456789/evt/event_1/fmt/json : msg.payload : Object
▸{ randomNumber: 75 }
5/20/2023, 7:07:40 PM   node: debug 1
iot-2/type/UCER/id/23456789/evt/event_1/fmt/json : msg.payload : Object
▸{ randomNumber: 69 }
5/20/2023, 7:07:44 PM   node: debug 1
iot-2/type/UCER/id/23456789/evt/event_1/fmt/json : msg.payload : Object
▸{ randomNumber: 29 }
5/20/2023, 7:07:47 PM   node: debug 1
iot-2/type/UCER/id/23456789/evt/event_1/fmt/json : msg.payload : Object
▸{ randomNumber: 28 }
```

11. I get the result at the data board



Drowsiness detection

status **Wake up!**

5.CODING & SOLUTIONING

5.1 Feature 1:

Eye b linking frequency.

The healthy human blinks around 15–20 times per minute, however the precorneal tear film, which lubricates the eye, only begins drying up approximately 25 s after a blink ends . This suggests that we blink more often than needed to maintain a lubricated precorneal tear film.

5.2 Feature 2:

Yawning frequency:

Yawning is a behavior that begins in the first stages of life. It has not only been observed in infants and in newborns, but also in fetuses of 12-14 weeks' gestational age. Yawning frequency changes over the life span. In preterm infants, the number of yawns decreases between 31- and 40-weeks' postconceptional age, mainly during the day.

Healthy individual yawn about 20 times per day although the frequency defers according to age circadianand between individuals more than 3 yawns per 15 min appears to be a a reasonable cut off between physiological and excessive yawning.

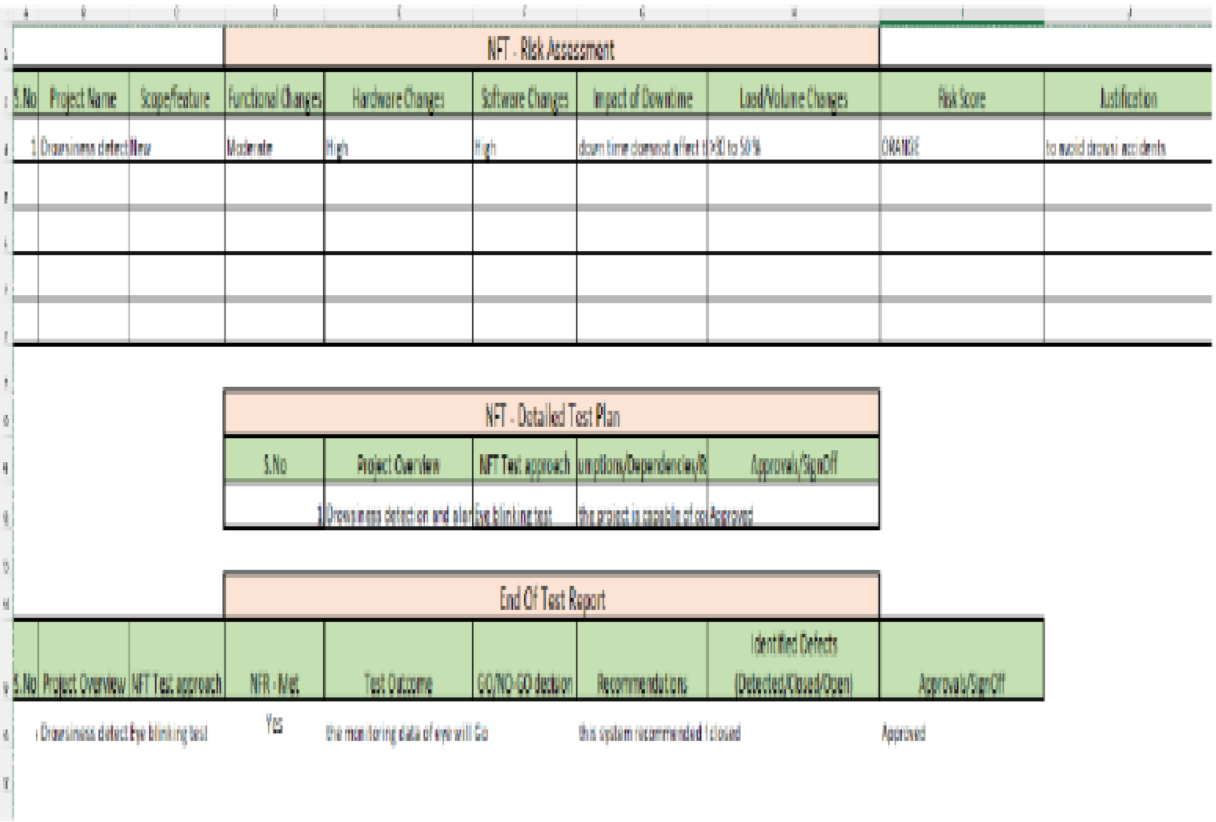
5.3 Feature 3:

Head position :

The system capture frame and detects the face and eyes using classifiers the face is detected and the eyes are closed then head position is monitored for next few frames face is alaining down gradually and continuously and the alarm is activated.

6.RESULTS

6.1 Performance Metrics



NFT - Risk Assessment

S.No	Project Name	Scope/feature	Functional Changes	Hardware Changes	Software Changes	Impact of Downtime	Load/Volume Changes	Risk Score	Justification
1	Drowsiness detect	New	Moderate	High	High	down time cannot affect t	>30 to 50 %	ORANGE	to avoid drowsi accidents

NFT - Detailed Test Plan

S.No	Project Overview	NFT Test approach	umptions/Dependencies/R	Approvals/SignOff
1	Drowsiness detection and aler	Eye blinking test	the project is capable of co	Approved

End Of Test Report

S.No	Project Overview	NFT Test approach	NFR - Met	Test Outcome	GO/NO-GO decision	Recommendations	Identified Defects (Detected/Closed/Open)	Approvals/SignOff
1	Drowsiness detect	Eye blinking test	Yes	the monitoring data of eye will	Go	this system recommended t	closed	Approved

7. ADVANTAGES:

- Light weight code, simple method
- Can work in dark used eyebrow monitoring
- Easy implementation due to readily available due to hardware and software
- An efficient system to identify user attentiveness based on fatigue system detection.

DISADVANTAGE:

- **Damage of sensor cannot be used.**
- **It increases the cost digital system reduces the cost of the system.**

8.CONCLUSION:

A non-invasive system to localize the eyes and monitor fatigue was developed. Information about the eyes position is obtained through self-developed image processing algorithm. During the monitoring, the system is able to decide if the eyes are opened or closed. When the eyes have been closed for too long, a warning signal is issued. In addition, during monitoring, the system is able to automatically detect any eye localizing error that might have occurred. In case of this type of error, the system is able to recover and properly localize the eyes.

- Image processing achieves highly accurate and reliable detection of drowsiness.
- Image processing offers a non-invasive approach to detecting drowsiness without the annoyance and interference.
- A drowsiness detection system developed around the principle of image processing judges the driver's alertness level on the basis of continuous eye closures.

With 80% accuracy, it is obvious that there are limitations to the system

9. FUTURE SCOPE

This technology is still in the early research stage of development. Based on the work completed thus far, following modifications can be implemented:

- Capture individual drivers steering activity while drowsy
- Conduct additional simulator experiments to validate the algorithm, test additional road

  conditions, and test a more diversified group of drivers,
- Test and refine the algorithm based on the road test data, and conduct research on warning systems integrated with the detection system

10.APPENDIX

10.1 SOURCE CODE:

```
import cv2
import dlib
import requests
import pyttsx3
from scipy.spatial import distance

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

#Provide your IBM Watson Device Credentials
organization = "96ei56"
deviceType = "Drowsy"
deviceId = "12052001"
authMethod = "token"
authToken = "03121975"

def ibmstart(x):

    def myCommandCallback(cmd):
        print("Command received: %s" %
cmd.data['command'])
```

```
        print(cmd)

    try:
      deviceOptions = {"org": organization,
"type": deviceType, "id": deviceId, "auth-
method": authMethod, "auth-token": authToken}
      deviceCli =
ibmiotf.device.Client(deviceOptions)

#..............................................

    except Exception as e:
      print("Caught exception connecting
device: %s" % str(e))
      sys.exit()

    deviceCli.connect()
    data = { 'Status' : x}
    #print data
    def myOnPublishCallback():
        print ("Published Status = %s" % x, "to
IBM Watson")

    success = deviceCli.publishEvent("DD",
"json", data, qos=0,
on_publish=myOnPublishCallback)
    if not success:
        print("Not connected to IoTF")


    deviceCli.commandCallback =
myCommandCallback
    deviceCli.disconnect()



# INITIALIZING THE pyttsx3 SO THAT
# ALERT AUDIO MESSAGE CAN BE DELIVERED
```

```
engine = pyttsx3.init()

# SETTING UP OF CAMERA TO 1 YOU CAN
# EVEN CHOOSE 0 IN PLACE OF 1
cap = cv2.VideoCapture(0)

# FACE DETECTION OR MAPPING THE FACE TO
# GET THE Eye AND EYES DETECTED
face_detector =
dlib.get_frontal_face_detector()

# PUT THE LOCATION OF .DAT FILE (FILE FOR
# PREDECTING THE LANDMARKS ON FACE )
dlib_facelandmark =
dlib.shape_predictor("C:/Users/NIKITHA/Desktop/
intern/shape_predictor_68_face_landmarks.dat")

# FUNCTION CALCULATING THE ASPECT RATIO FOR
# THE Eye BY USING EUCLIDEAN DISTANCE FUNCTION
def Detect_Eye(eye):
  poi_A = distance.euclidean(eye[1], eye[5])
  poi_B = distance.euclidean(eye[2], eye[4])
  poi_C = distance.euclidean(eye[0], eye[3])
  aspect_ratio_Eye = (poi_A+poi_B)/(2*poi_C)
  return aspect_ratio_Eye


# MAIN LOOP IT WILL RUN ALL THE UNLESS AND
# UNTIL THE PROGRAM IS BEING KILLED BY THE USER
while True:

  null, frame = cap.read()
  flag=0
  gray_scale = cv2.cvtColor(frame,
cv2.COLOR_BGR2GRAY)

  faces = face_detector(gray_scale)
  for face in faces:
    face_landmarks =
dlib_facelandmark(gray_scale, face)
    leftEye = []
    rightEye = []

    # THESE ARE THE POINTS ALLOCATION FOR THE
    # LEFT EYES IN .DAT FILE THAT ARE FROM 42
TO 47
    for n in range(42, 48):
      x = face_landmarks.part(n).x
      y = face_landmarks.part(n).y
      rightEye.append((x, y))
      next_point = n+1
      if n == 47:
        next_point = 42
      x2 = face_landmarks.part(next_point).x
      y2 = face_landmarks.part(next_point).y
      cv2.line(frame, (x, y), (x2, y2), (0,
255, 0), 1)

    # THESE ARE THE POINTS ALLOCATION FOR THE
    # RIGHT EYES IN .DAT FILE THAT ARE FROM 36
TO 41
    for n in range(36, 42):
      x = face_landmarks.part(n).x
      y = face_landmarks.part(n).y
      leftEye.append((x, y))
      next_point = n+1
      if n == 41:
        next_point = 36
      x2 = face_landmarks.part(next_point).x
      y2 = face_landmarks.part(next_point).y
      cv2.line(frame, (x, y), (x2, y2), (255,
255, 0), 1)

    # CALCULATING THE ASPECT RATIO FOR LEFT
    # AND RIGHT EYE
    right_Eye = Detect_Eye(rightEye)
    left_Eye = Detect_Eye(leftEye)
    Eye_Rat = (left_Eye+right_Eye)/2

    # NOW ROUND OF THE VALUE OF AVERAGE MEAN
    # OF RIGHT AND LEFT EYES
    Eye_Rat = round(Eye_Rat, 2)

    # THIS VALUE OF 0.25 (YOU CAN EVEN CHANGE
IT)
    # WILL DECIDE WHETHER THE PERSONS'S EYES
ARE CLOSE OR NOT
    if Eye_Rat < 0.25:
      cv2.putText(frame, "DROWSINESS DETECTED",
(50, 100),
            cv2.FONT_HERSHEY_PLAIN, 2, (21, 56,
210), 3)
      cv2.putText(frame, "Alert!!!! WAKE UP
DUDE", (50, 450),
            cv2.FONT_HERSHEY_PLAIN, 2, (21, 56,
212), 3)

      # CALLING THE AUDIO FUNCTION OF TEXT TO
      # AUDIO FOR ALERTING THE PERSON
      engine.say("Alert!!!! WAKE UP DUDE")
      flag=1
      engine.runAndWait()



  cv2.imshow("Drowsiness DETECTOR IN OPENCV2",
frame)
  print(flag)
  ibmstart(flag)
  '''
  while True:

                data = { 'Status' : x}
                #print data
                def myOnPublishCallback():
                    print ("Published Status =
%s" % x, "to IBM Watson")

                success =
deviceCli.publishEvent("DD", "json", data,
qos=0, on_publish=myOnPublishCallback)
                if not success:
                    print("Not connected to
IoTF")
                time.sleep(1)

                deviceCli.commandCallback =
myCommandCallback
  '''
  #r1 =
requests.get('https://api.thingspeak.com/update
?api_key=SEWZDEK7APG3P0P8&field1='+str(flag))
  #print(r1.status_code)
  key = cv2.waitKey(9)
  if key == 20:
    break

# Disconnect the device and application from
the cloud
#deviceCli.disconnect()
cap.release()
cv2.destroyAllWindows()
```

GitHub LINK:

https://github.com/naanmudhalvan-SI/IBM--11706-1682501059/tree/main

Project Video Demo Link:

https://youtu.be/G8LRLzFTJsY