KONGUNADU COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

HX 8001-PROFESSIONAL READINESS FOR INNOVATION, EMPLOYABILITY AND ENTREPRENEURSHIP

SMART SOLUTION FOR RAILWAYS USING IOT

NALAIYA THIRAN PROJECT REPORT 2022

Submitted by

YOGESH K	**621319106318**
JAYARAJ C	**621319106308**
THIYAGU M	**621319106096**
SARAN P	**621319106080**

Team ID: PNT2022TMID13605

NOVEMBER 2022

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1.INTRODUCTION

1.1 PROJECT OVERVIEW

This software is used to book a train ticket using a customizable online user interface. By purchasing the ticket using the online interface, the user receives a unique ID and generates a QR code that comprises all of their personal information, including boarding and destination. The QR code is mostly used for checking, which facilitates the task of verifying the authenticity of the ticket for the ticket checker. After making a reservation, the user will receive a special ID and QR code. Via the perspective of the ticket checkers, they can receive a unique login from the online UI. The ticket checker scans the QR code using a QR code reader.The Ticket Checker can access the passenger's booking information from the cloud IOT by scanning the QR code.

1.2 PURPOSE

The Internet is required for computer networks to connect. However, as the globe evolves, its use is becoming more widespread than merely online surfing and email. The modern internet, which also interacts with embedded sensors, has led to the development of smart homes, smart rural communities, and e-health. Care's etc. established the concept of IOT. The term "Internet of Things" refers to the connection or communication between two or more devices without any human-to-human or human-to-computer contact. Connected devices employ sensors or actuators to perceive the environment around them. The four essential components of IOT include sensing the device will get access to the device, processing the device's data, and providing applications and services. Additionally, it provides data security and privacy.Automation has an effect on every aspect of our everyday lives. More developments are being developed almost in every business to decrease human effort and save time. When attempting to automate track testing, the same is taken into account. Railroad track is an essential part of every company's asset base since it makes it possible for them to run their operations as normal. Issues with railways must be resolved in order to avoid more problems. The most current method used by the Indian railroad necessitates spending a lot of time and effort following the railway lines..

2.LITERATURE SURVEY

PAPER NAME	AUTHOR	YEAR	METHOLOGY	MERITS	DEMERITS
Passenger Monitoring Model for easily Accessible Public City Trams/Trains.	Roman Khoeblal, Teeravisit Laohapensaeng, Roungsan Chaisricharoen	2015	Passenger monitoring, passenger control RFID distance reading, ticket control, RFID ticketinspection.	It is possible to travel cross country with a single public transportation card, using transport systems of several transport operators.	Applicable only for passenger monitoring.
Application of smart computing in Indian Railway Systems.	Parag Chatterjee, Asoke Nath	2014	By Interlinking unique identification system with train ticket reservation system by using video surveillance, rail sensors, biometric input devices and multimedia displays.	Reduces manual effort in passenger data entry. Provides security verification.	Significant investment is needed. Risk of database.
Android Suburban Railway Ticketing with GPS as Ticket Checker.	Sana Khoja, Maithili Kadam	2012	Android, SQ lite,Cloud Database,ASR, QR Code.	E-Ticket facility, enabling reuse and replacement of components.	QR Codes before the user enters or leaves the station, where the user can have access which is risk inticket booking.

Novel Approach for Smart Indian Railways.	Sujith Kumar, K.M.Yatheendra Parvan, V.Sumathy, Thejeswari C.K	2017	Digitalization, SmartRailways, Aadhar Card, Smartphone, Identity Verification.	Employ a mobile application through which passengers can access various ticketing options in user friendly and efficient manner.	Biometric database is risk of hacking.
A Review on IOT based automated seat allocation and verification using QR code.	Sarvath Saba, Sharon Philip, Shriharsha, Mukund Naik, Sudeep Sherry	2022	The system lets the passenger to have a comfortable journey by checkingthe temperature first for normal andthen the count for avoid crowd using the QR Code.	This model proposes a radical change in train operation and passenger experience. One of the many steps towards a more digitized society as a part of the “Digital India” movement proposed in 2015 by the Prime Minister.	The system is not fool-proof and requires a dramatic change in the existing system in terms of the people allowed on platforms, etc. but baby steps matter.

2.2 REFERENCES

1. Roman Khoeblal, Teeravisit Laohapensaeng, Roungsan Chaisricharoen, “Passenger Monitoring Model for easily Accessible Public City Trams/Trains” (2015).

2. Parag Chatterjee, Asoke Nath, “Application of smart computing in IndianRailway Systems” (2014).

3. Sana Khoja, Maithili Kadam, “Android Suburban Railway Ticketing with GPS as Ticket Checker”

4. Sujith Kumar, K.M.Yatheendra Parvan, V.Sumathy, Thejeswari C.K, “Novel Approach for Smart Indian Railways” (2017). 5. Sarvath Saba, Sharon Philip, Shriharsha, Mukund Naik, Sudeep Sherry, “A Review (2012).

2.3 PROBLEM STATEMENT

Problem Statement (PS)	I am (Customer)	I'm tryingto	But	Because	Which makes me feel
PS - 1	User	Book a ticket through application	Unable to book ticket properly	Lack of Guidance in those application	Cofused
PS – 2	Passenger	Book a train Seat Berth	Not Sure information about the berth	Evert seating showing as same	Irritated
PS – 3	Passenger	Give a feedback or complaint about my journey	I couldn't able to do that	There is no option like that in application	Hate
PS – 4	Government	Avoid Ticketless traveling in Railways	Some people are not following the rule	There is no checking while entering the platform	Worst

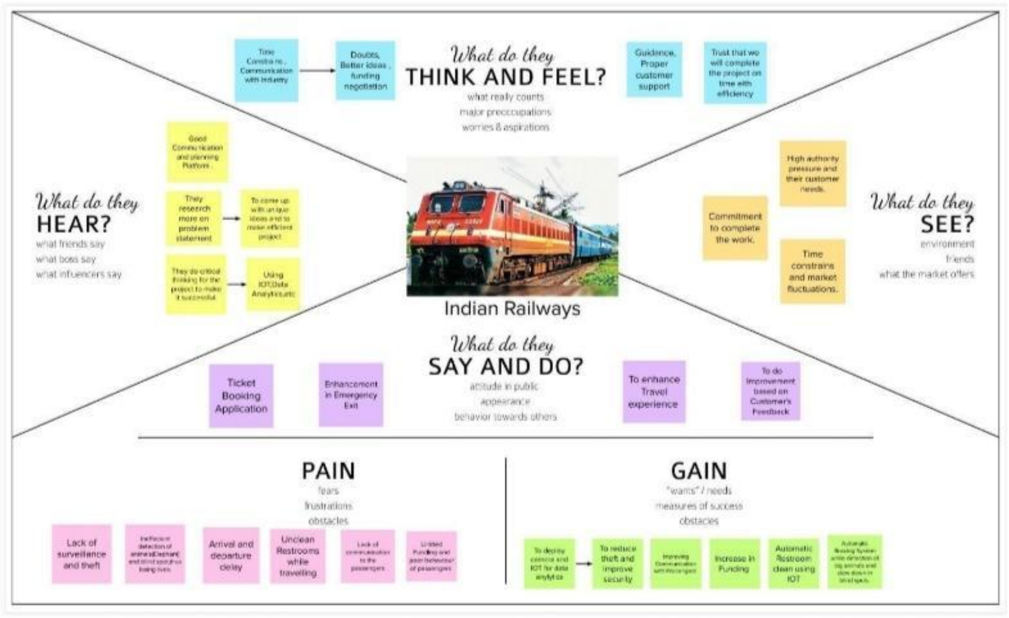
3.IDEATION AND PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS

Empathy Map Canvas:

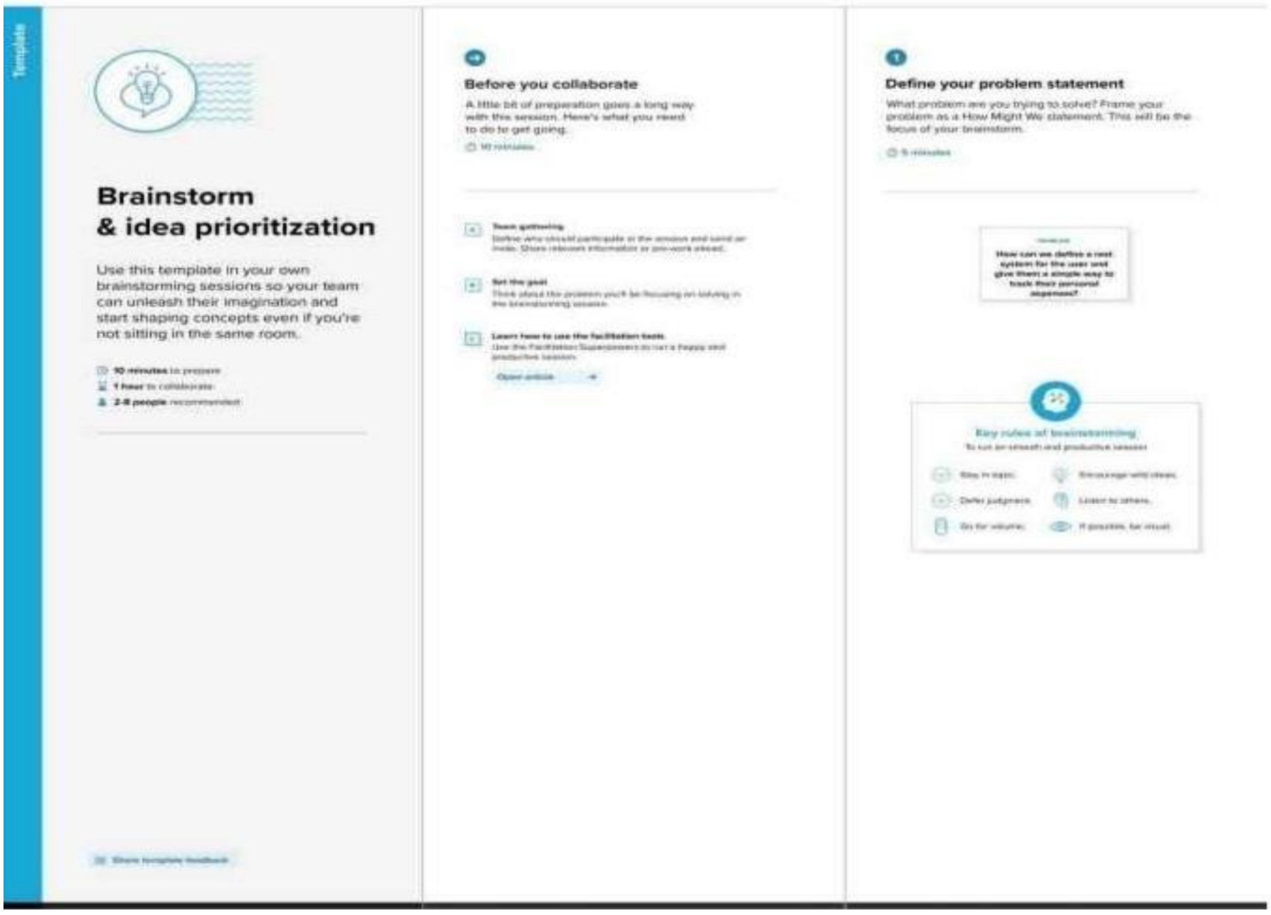
An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviours and attitudes.

Reference:
https://app.mural.co/invitation/mural/smartinternzibmiotsmartsolut6184/1662790391718?sender=ub72a907284043284ab647148&key=b27221cd-3c1b-44a4-bd15-1947bfd7faff



Time Constrains, Communication with Industry
Doubts, Better ideas, funding negotiation
What do they THINK AND FEEL?
what really counts
major preoccupations
worries & aspirations
Guidance, Proper customer support
Trust that we will complete the project on time with efficiency
Good Communication and planning Platform.
What do they HEAR?
what friends say
what boss say
what influencers say
They research more on problem statement
To come up with unique ideas and to make efficient project
They do critical thinking for the project to make it successful
Using IOT,Data Analytics,etc
High authority pressure and their customer needs.
Commitment to complete the work.
Time constrains and market fluctuations.
What do they SEE?
environment
friends
what the market offers
Indian Railways
What do they SAY AND DO?
attitude in public
appearance
behavior towards others
Ticket Booking Application
Enhancement in Emergency Exit
To enhance Travel experience
To do Improvement based on Customer's Feedback
PAIN
fears
frustrations
obstacles
Lack of surveillance and theft
Arrival and departure delay
Unclean Restrooms while travelling
Lack of communication to the passengers
Limited Funding and poor behaviour of passengers
GAIN
"wants" / needs
measures of success
obstacles
To deploy cameras and IOT for data analytics
To reduce theft and improve security
Improving Communication with Passengers
Increase in Funding
Automatic Restroom clean using IOT

3.2 IDEATION AND BRAINSTORMING



Template

Brainstorm & idea prioritization

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

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

Share template feedback

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

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

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

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

Open article →

1 Define your problem statement

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

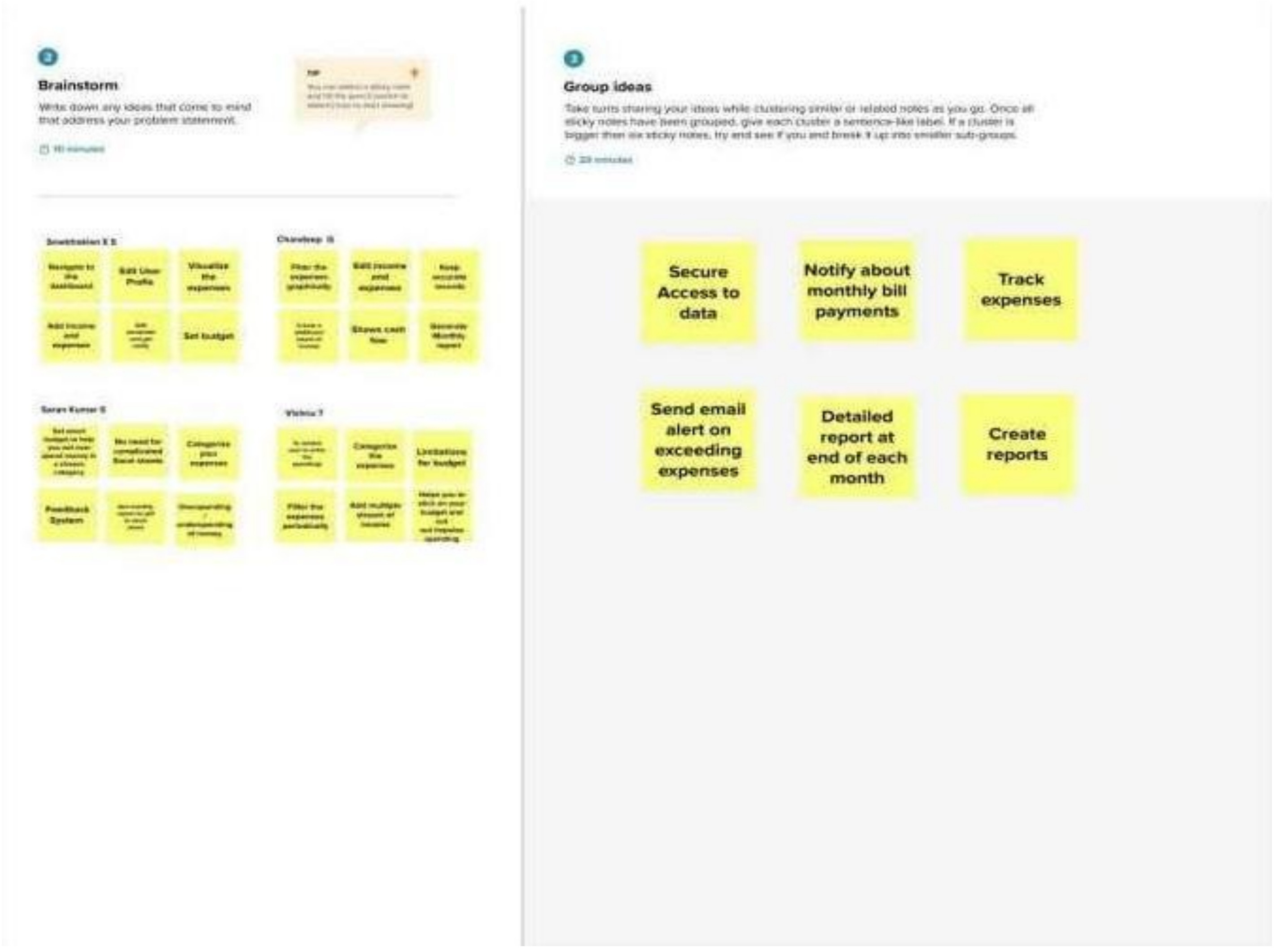
5 minutes

[illegible]

How can we define a rest system for the user and give them a simple way to track their personal expenses?

Key rules of brainstorming
To run an smooth and productive session

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



2

Brainstorm

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

10 minutes

Tip

[illegible]

Snekthakhi S S

Navigate to the dashboard

Edit User Profile

Visualize the expenses

Add income and expenses

[illegible]

Set budget

Chandeep B

Filter the expenses graphically

Edit income and expenses

Keep accurate records

[illegible]

Shows cash flow

Generate Monthly report

Saran Kumar S

Set smart budget to help you not over spend money in a chosen category

No need for complicated Excel sheets

Categorize your expenses

Feedback System

[illegible]

Overspending / understanding of money

Vishnu T

[illegible]

Categorize the expenses

Limitations for budget

Filter the expenses periodically

Add multiple stream of income

Helps you to stick on your budget and cut out impulse spending

3

Group ideas

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

20 minutes

Secure Access to data

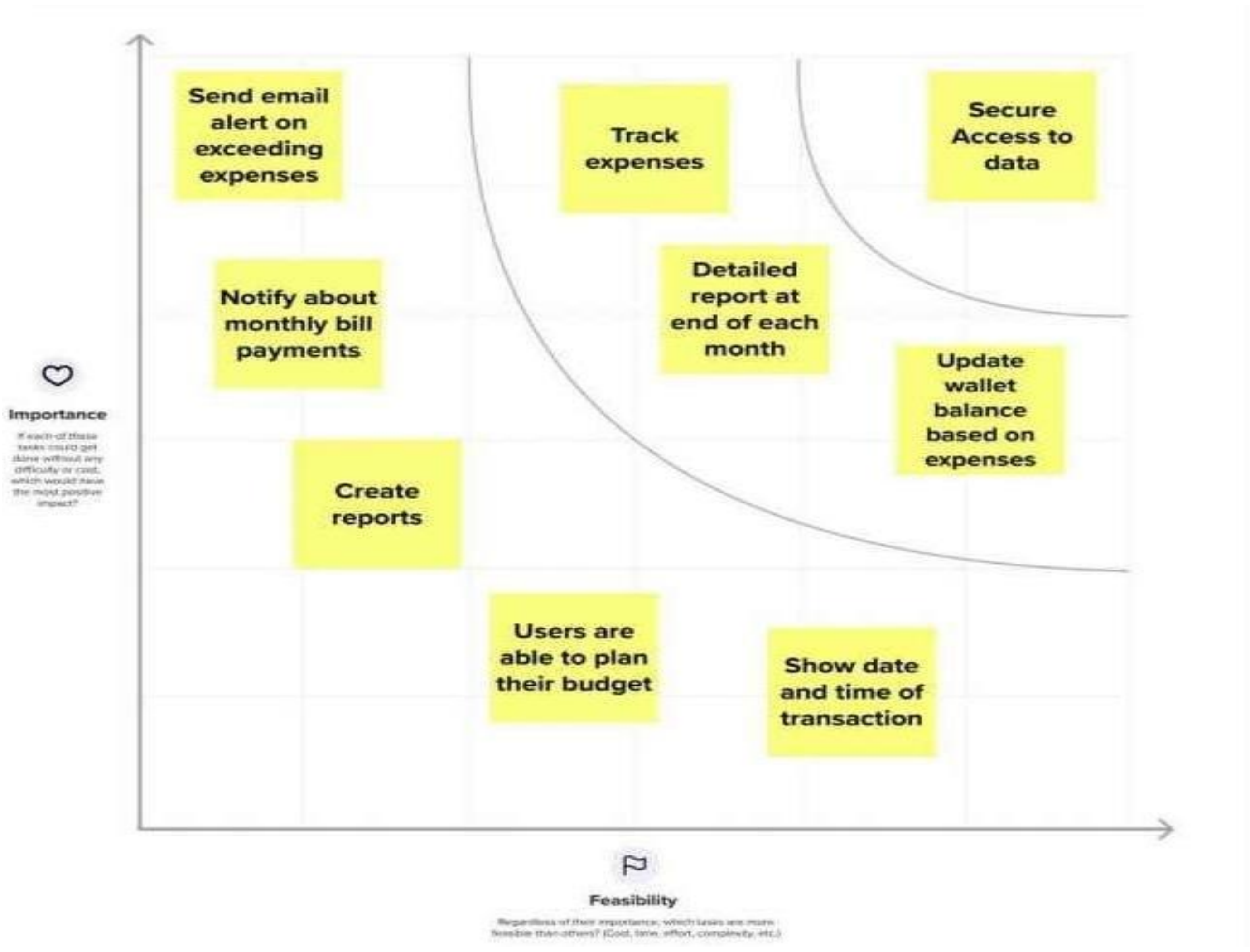
Notify about monthly bill payments

Track expenses

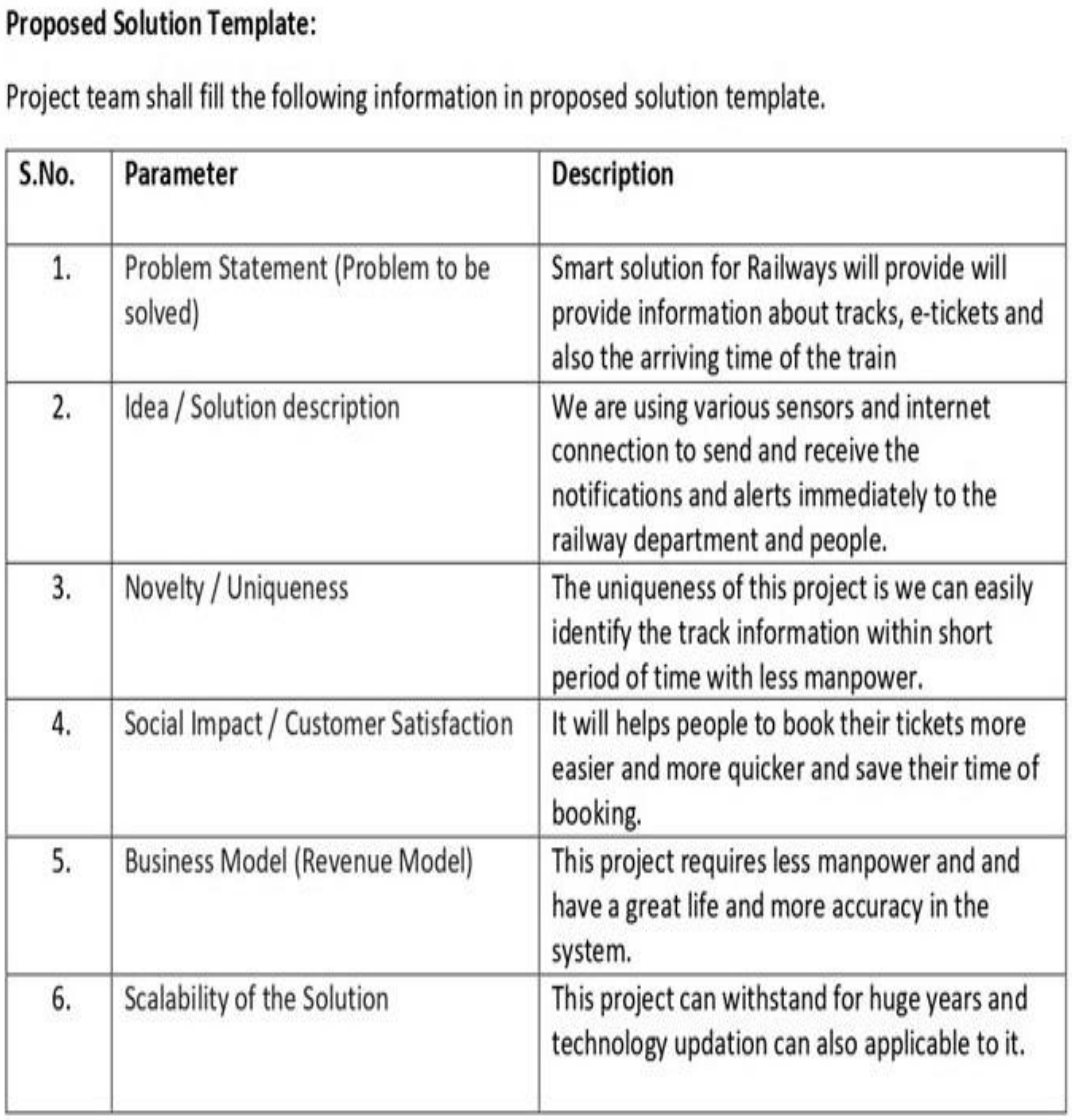
Send email alert on exceeding expenses

Detailed report at end of each month

Create reports


Send email alert on exceeding expenses
Track expenses
Secure Access to data
Notify about monthly bill payments
Detailed report at end of each month
Update wallet balance based on expenses
Create reports
Users are able to plan their budget
Show date and time of transaction
Importance
If each of these tasks could get done without any difficulty or cost, which would have the most positive impact?
Feasibility
Regardless of their importance, which tasks are more feasible than others? (Cost, time, effort, complexity, etc.)

3.3 PROPOSED SOLUTION

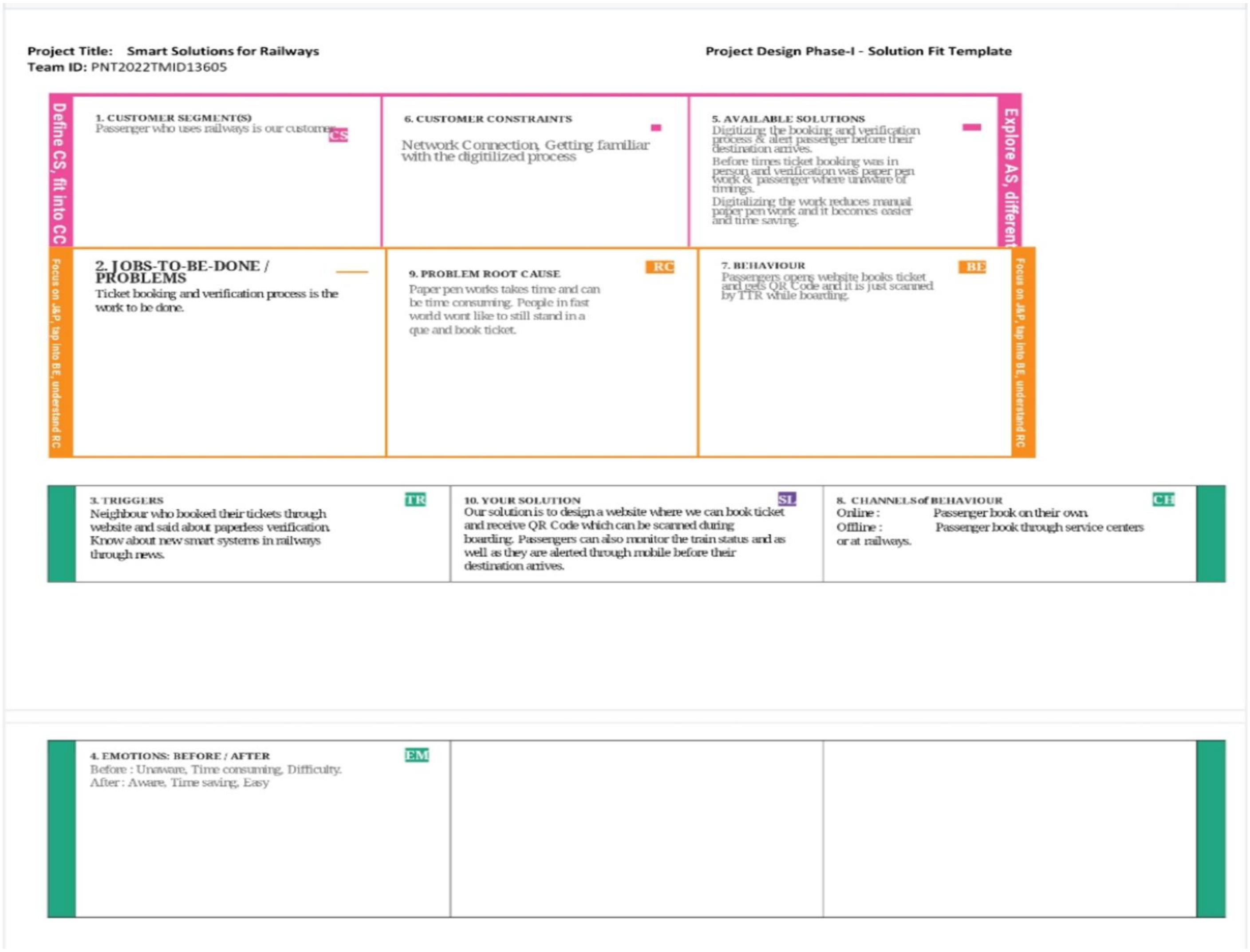


Proposed Solution Template:

Project team shall fill the following information in proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Smart solution for Railways will provide will provide information about tracks, e-tickets and also the arriving time of the train
2.	Idea / Solution description	We are using various sensors and internet connection to send and receive the notifications and alerts immediately to the railway department and people.
3.	Novelty / Uniqueness	The uniqueness of this project is we can easily identify the track information within short period of time with less manpower.
4.	Social Impact / Customer Satisfaction	It will helps people to book their tickets more easier and more quicker and save their time of booking.
5.	Business Model (Revenue Model)	This project requires less manpower and and have a great life and more accuracy in the system.
6.	Scalability of the Solution	This project can withstand for huge years and technology updation can also applicable to it.

3.4 PROBLEM SOLUTION FIT



Project Title: **Smart Solutions for Railways**
Team ID: PNT2022TMID13605

Project Design Phase-I - Solution Fit Template

Define CS, fit into CC

1. CUSTOMER SEGMENT(S) CS
Passenger who uses railways is our customer

6. CUSTOMER CONSTRAINTS
Network Connection, Getting familiar with the digitilized process

5. AVAILABLE SOLUTIONS
Digitizing the booking and verification process & alert passenger before their destination arrives.
Before times ticket booking was in person and verification was paper pen work & passenger where unaware of timings.
Digitalizing the work reduces manual paper pen work and it becomes easier and time saving.

Explore AS, different

Focus on J&P, tap into BE, understand RC

2. JOBS-TO-BE-DONE / PROBLEMS
Ticket booking and verification process is the work to be done.

9. PROBLEM ROOT CAUSE RC
Paper pen works takes time and can be time consuming. People in fast world wont like to still stand in a que and book ticket.

7. BEHAVIOUR BE
Passengers opens website books ticket and gets QR Code and it is just scanned by TTR while boarding.

Focus on J&P, tap into BE, understand RC

3. TRIGGERS TR
Neighbour who booked their tickets through website and said about paperless verification.
Know about new smart systems in railways through news.

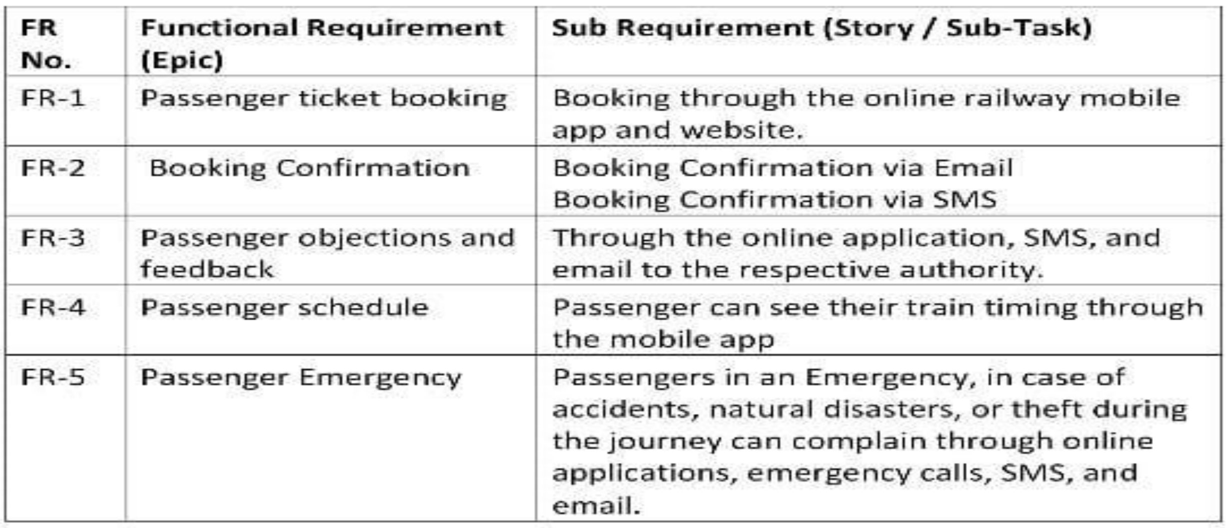
10. YOUR SOLUTION SL
Our solution is to design a website where we can book ticket and receive QR Code which can be scanned during boarding. Passengers can also monitor the train status and as well as they are alerted through mobile before their destination arrives.

8. CHANNELS of BEHAVIOUR CH
Online : Passenger book on their own.
Offline : Passenger book through service centers or at railways.

4. EMOTIONS: BEFORE / AFTER EM
Before : Unaware, Time consuming, Difficulty.
After : Aware, Time saving, Easy

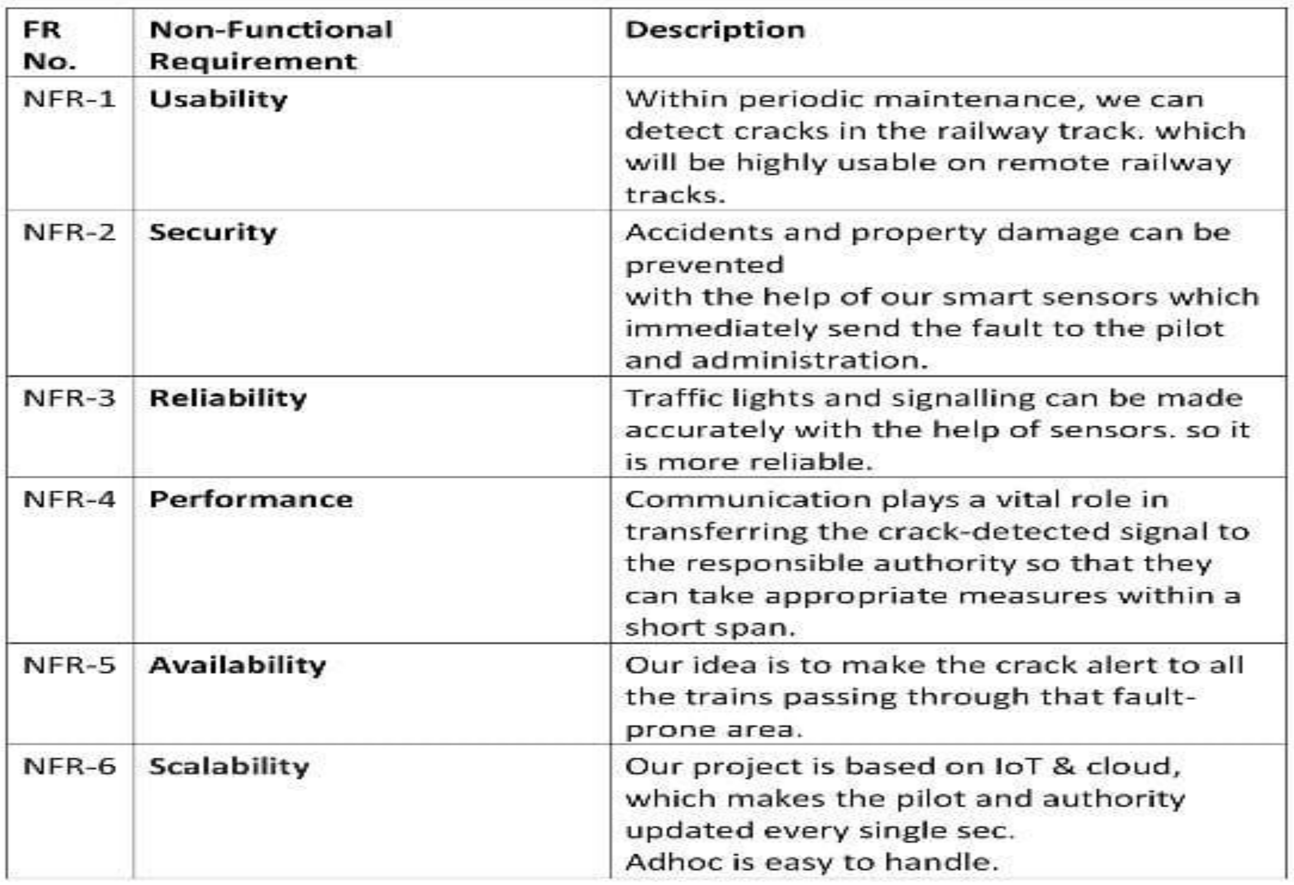
4.REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENTS



FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Passenger ticket booking	Booking through the online railway mobile app and website.
FR-2	Booking Confirmation	Booking Confirmation via Email Booking Confirmation via SMS
FR-3	Passenger objections and feedback	Through the online application, SMS, and email to the respective authority.
FR-4	Passenger schedule	Passenger can see their train timing through the mobile app
FR-5	Passenger Emergency	Passengers in an Emergency, in case of accidents, natural disasters, or theft during the journey can complain through online applications, emergency calls, SMS, and email.

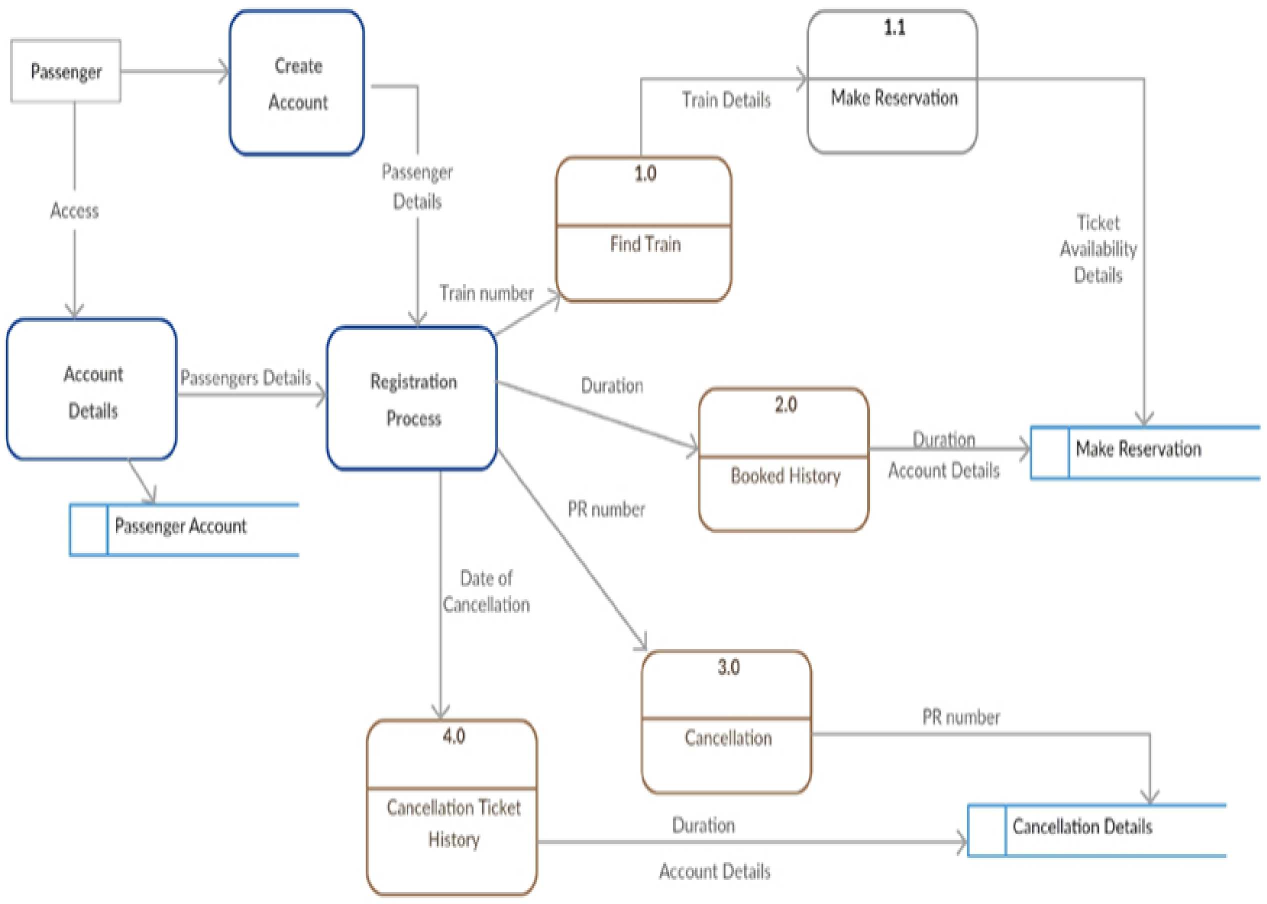
4.2 NON – FUNCTIONAL REQUIREMENTS



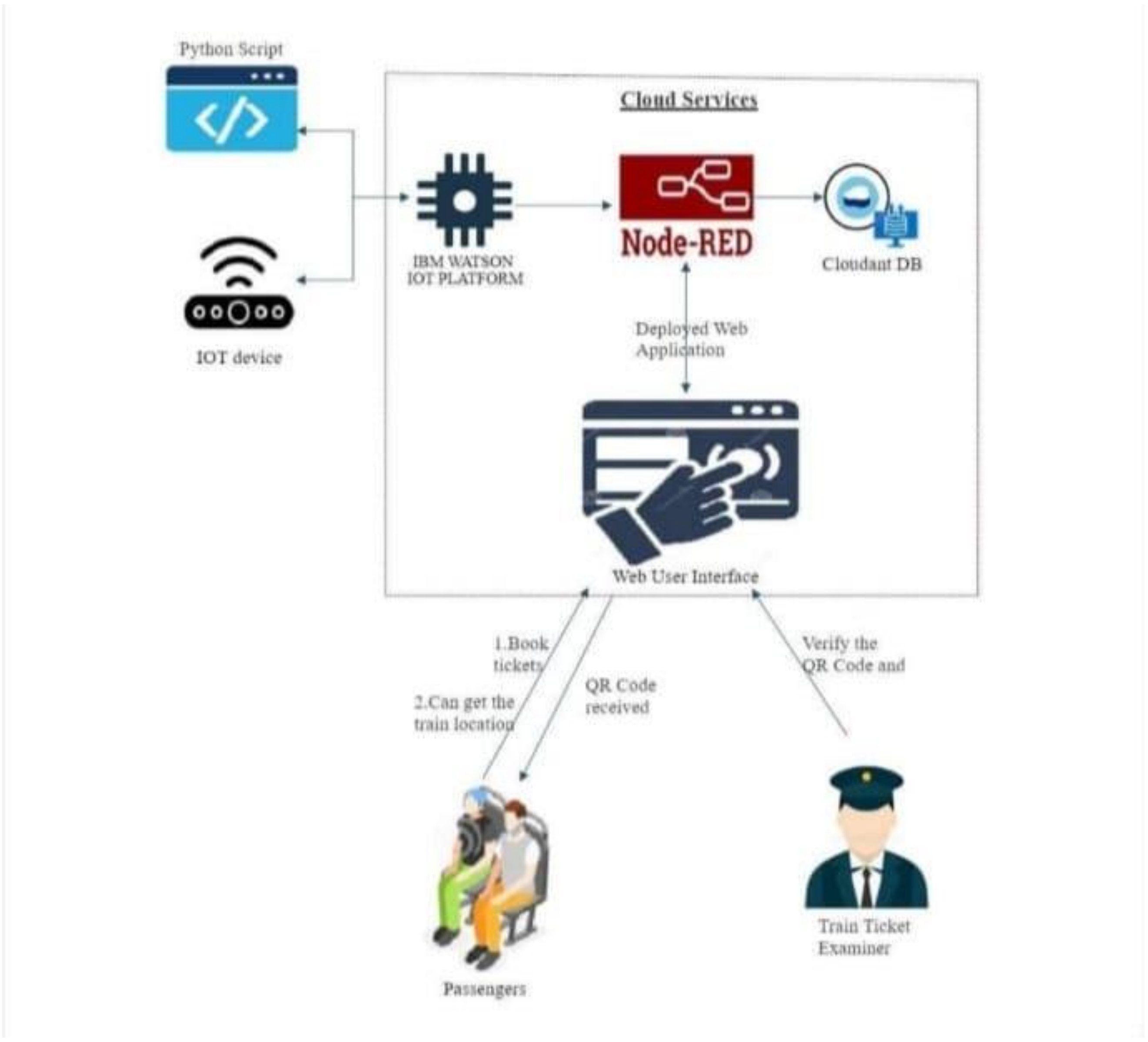
FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	Within periodic maintenance, we can detect cracks in the railway track. which will be highly usable on remote railway tracks.
NFR-2	**Security**	Accidents and property damage can be prevented with the help of our smart sensors which immediately send the fault to the pilot and administration.
NFR-3	**Reliability**	Traffic lights and signalling can be made accurately with the help of sensors. so it is more reliable.
NFR-4	**Performance**	Communication plays a vital role in transferring the crack-detected signal to the responsible authority so that they can take appropriate measures within a short span.
NFR-5	**Availability**	Our idea is to make the crack alert to all the trains passing through that fault-prone area.
NFR-6	**Scalability**	Our project is based on IoT & cloud, which makes the pilot and authority updated every single sec. Adhoc is easy to handle.

5.PROJECT DESIGN

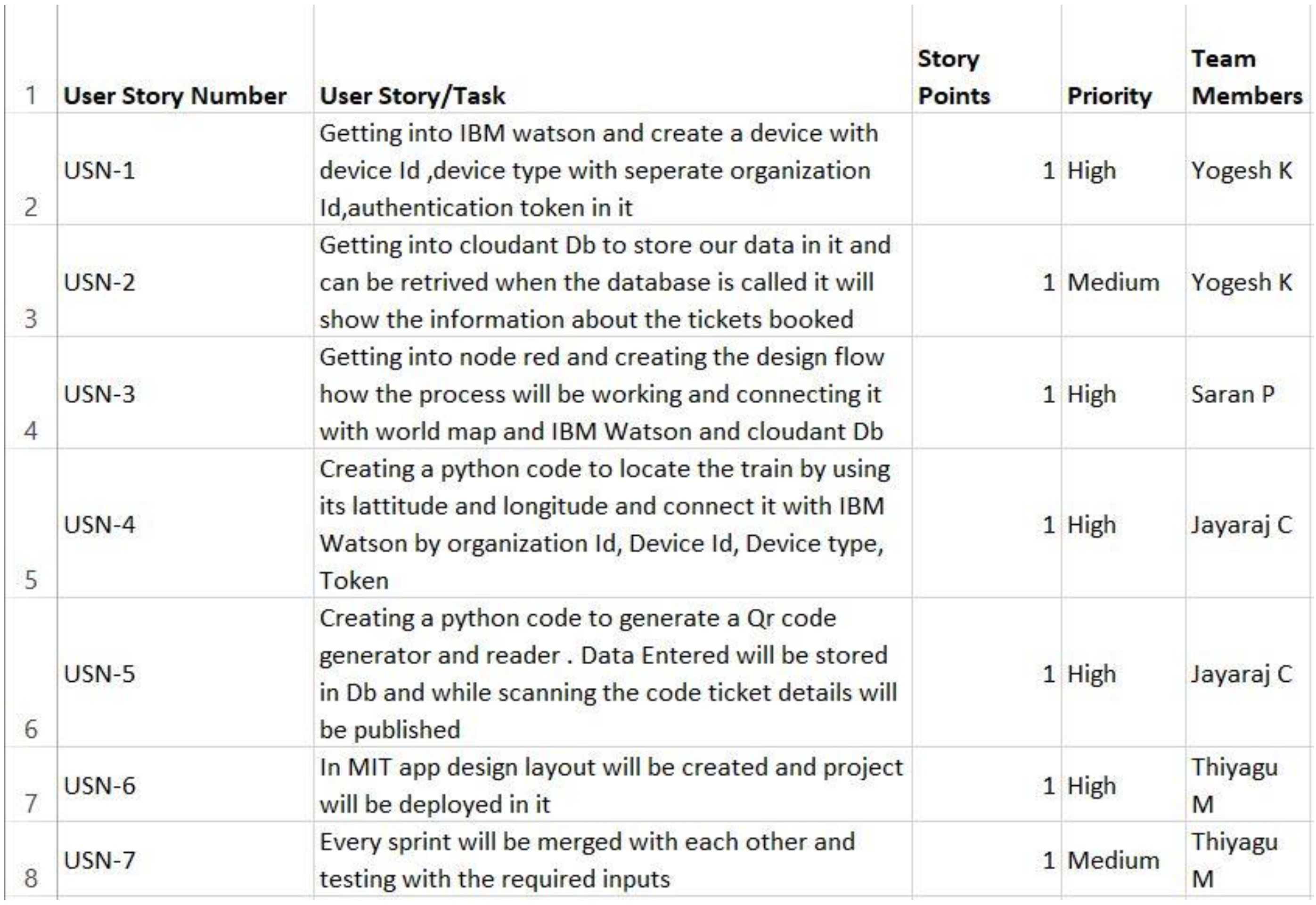
5.1 DATA FLOW DIAGRAM



5.2 SOLUTION AND TECHNICAL ARCHITECTURE

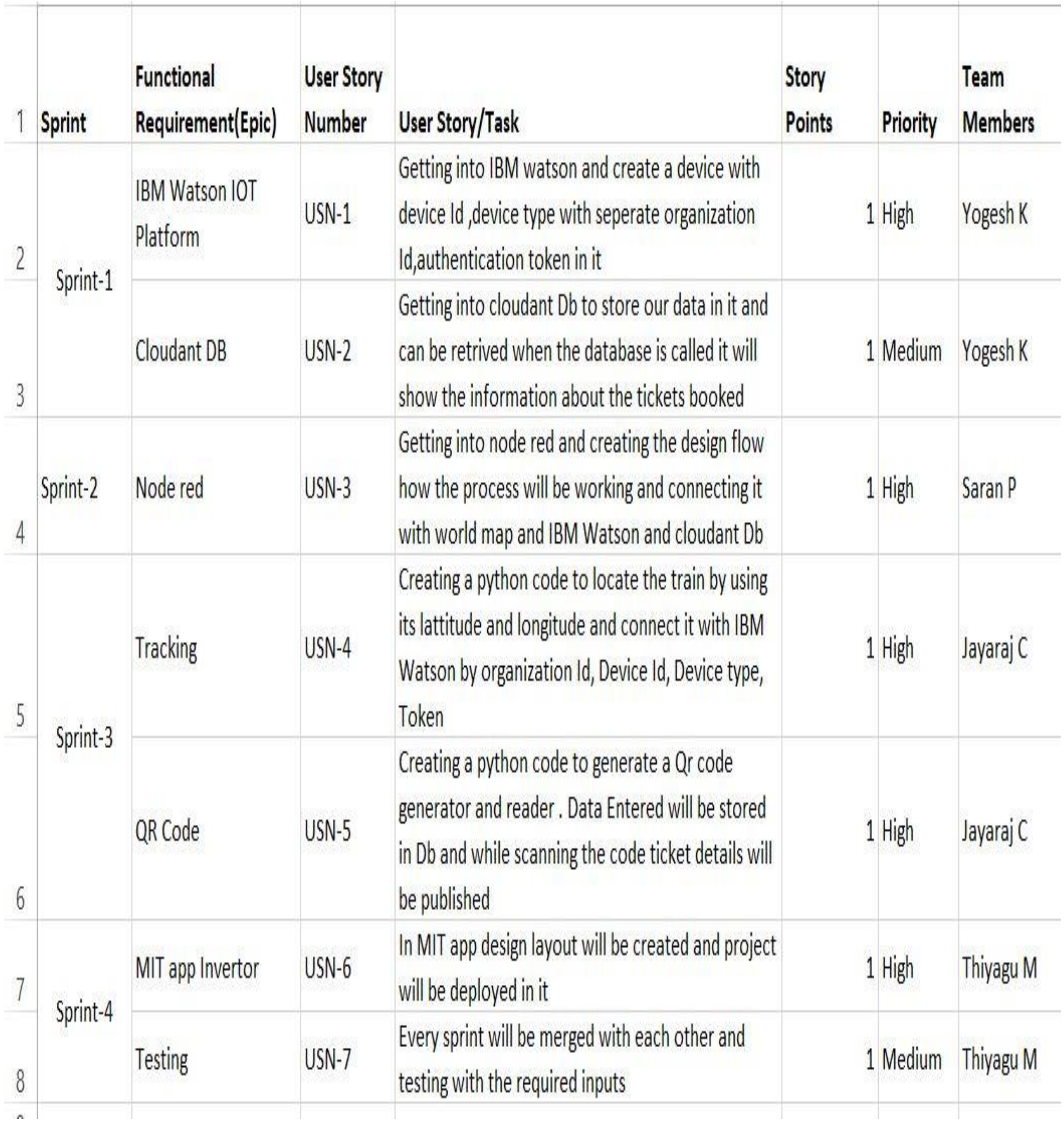


5.3 USER STORIES



1	User Story Number	User Story/Task	Story Points	Priority	Team Members
2	USN-1	Getting into IBM watson and create a device with device Id ,device type with seperate organization Id,authentication token in it	1	High	Yogesh K
3	USN-2	Getting into cloudant Db to store our data in it and can be retrived when the database is called it will show the information about the tickets booked	1	Medium	Yogesh K
4	USN-3	Getting into node red and creating the design flow how the process will be working and connecting it with world map and IBM Watson and cloudant Db	1	High	Saran P
5	USN-4	Creating a python code to locate the train by using its lattitude and longitude and connect it with IBM Watson by organization Id, Device Id, Device type, Token	1	High	Jayaraj C
6	USN-5	Creating a python code to generate a Qr code generator and reader . Data Entered will be stored in Db and while scanning the code ticket details will be published	1	High	Jayaraj C
7	USN-6	In MIT app design layout will be created and project will be deployed in it	1	High	Thiyagu M
8	USN-7	Every sprint will be merged with each other and testing with the required inputs	1	Medium	Thiyagu M

6.PROJECT PLANNING AND SCHEDULING

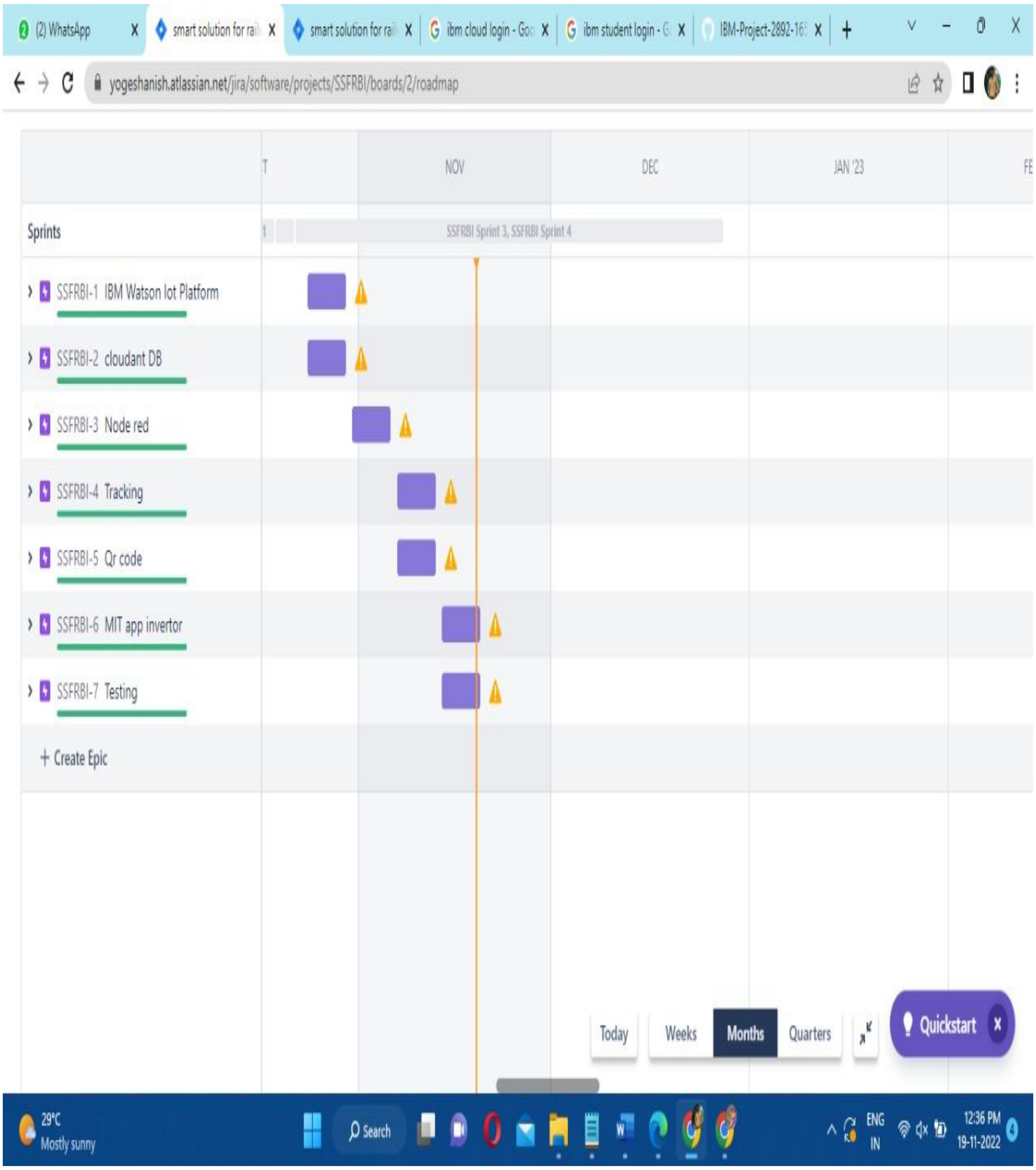


1	Sprint	Functional Requirement(Epic)	User Story Number	User Story/Task	Story Points	Priority	Team Members
2	Sprint-1	IBM Watson IOT Platform	USN-1	Getting into IBM watson and create a device with device Id ,device type with seperate organization Id,authentication token in it	1	High	Yogesh K
3		Cloudant DB	USN-2	Getting into cloudant Db to store our data in it and can be retrived when the database is called it will show the information about the tickets booked	1	Medium	Yogesh K
4	Sprint-2	Node red	USN-3	Getting into node red and creating the design flow how the process will be working and connecting it with world map and IBM Watson and cloudant Db	1	High	Saran P
5	Sprint-3	Tracking	USN-4	Creating a python code to locate the train by using its lattitude and longitude and connect it with IBM Watson by organization Id, Device Id, Device type, Token	1	High	Jayaraj C
6		QR Code	USN-5	Creating a python code to generate a Qr code generator and reader . Data Entered will be stored in Db and while scanning the code ticket details will be published	1	High	Jayaraj C
7	Sprint-4	MIT app Invertor	USN-6	In MIT app design layout will be created and project will be deployed in it	1	High	Thiyagu M
8		Testing	USN-7	Every sprint will be merged with each other and testing with the required inputs	1	Medium	Thiyagu M

6.2 SPRINT DELIVERY SCHEDULE

Sprint	**Total Story Point s**	**Duratio n**	**Sprint StartDate**	**Sprint EndDate (Planned)**	**Story Points Completed (ason Planned End Date)**	**Sprint Release Date(Actual)**
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	5 Nov 2022
Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date(Planned)	Story Points Completed (as onPlanned End Date)	Sprint Release Date(Actual)
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov2022

JIRA:-


(2) WhatsApp
smart solution for rai
smart solution for rai
ibm cloud login - Goo
ibm student login - G
IBM-Project-2892-16
yogeshanish.atlassian.net/jira/software/projects/SSFRBI/boards/2/roadmap
NOV
DEC
JAN '23
Sprints
SSFRBI Sprint 3, SSFRBI Sprint 4
SSFRBI-1 IBM Watson Iot Platform
SSFRBI-2 cloudant DB
SSFRBI-3 Node red
SSFRBI-4 Tracking
SSFRBI-5 Qr code
SSFRBI-6 MIT app invertor
SSFRBI-7 Testing
+ Create Epic
Today
Weeks
Months
Quarters
Quickstart
29°C Mostly sunny
Search
ENG IN
12:36 PM 19-11-2022

7.CODING AND SOLUTIONING

7.1 FEATURE 1

- IoT Device
- IBM Watson platform
- Node Red
- Cloudant DB
- Web UI
- Geofence
- MIT App
- Python Code

7.2 FEATURE 2

- Registration
- Seats
- Name
- Age
- Mobile Number
- Boarding Station
- Destination Station

IBM code:-

```
import wiotp.sdk.deviceimport time

import random myConfig = { "identity": { "orgId": "625xj1",

"typeId": "GPS", "deviceId":"12345"

},

"auth": {

"token": "wOU&i?aL*2Le008hJ&"

}

}

def myCommandCallback (cmd):

print ("Message received from IBM IoT Platform: %s" %
cmd.data['command'])m=cmd.data['command']


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


def pub (data):

client.publishEvent(eventId="status", msgFormat="json", data=myData, qos=0,
onPublish=None)print ("Published data Successfully: %s", myData)


while True:

myData={'name': 'Train1', 'lat': 17.6387448,
'lon': 78.4754336}pub (myData)

time.sleep (3)

#myData={'name': 'Train2', 'lat': 17.6387448,
'lon': 78.4754336)#pub (myData)

#time.sleep (3)

myData={'name': 'Train1', 'lat': 17.6341908,
'lon': 78.4744722}pub(myData)

time.sleep(3)

myData={'name': 'Train1', 'lat': 17.6340889,
'lon': 78.4745052}pub (myData)
```

```
time.sleep (3)

myData={'name': 'Train1', 'lat': 17.6248626, 'lon': 78.4720259}

pub (myData)

time.sleep (3)

myData={'name': 'Train1', 'lat': 17.6188577,
'lon': 78.4698726}

pub (myData)

time.sleep (3)

myData={'name': 'Train1', 'lat': 17.6132382,
'lon': 78.4707318}pub (myData)

time.sleep (3)

client commandCallback = myCommandCallback

Client disconnect ()
```

QR CODE:-

```
import cv2

import numpy as np

import time

import pyzbar

from ibmcloudant import cloudant_v1

from ibmcloudant import CouchDbSessionAuthenticator

from ibm_cloud_sdk_core.authenticators import BasicAuthenticator


authenticator = BasicAuthenticator('apikey-v2-
acv8gh5fnu0u4mh2f8c5x975ae5rnphr3jxkr5d9ril','c1dd4db6e976d915751882f688e410ec')

service = cloudant_v1(authenticator=authenticator)


service.set_service_url('https://apikey-v2-
acv8gh5fnu0u4mh2f8c5x975ae5rnphr3jxkr5d9ril:c1dd4db6e976d915751882f688e410ec@adad2af9
-59c4-41bb-b4b4-806f0d6962b2-bluemix.cloudantnosqldb.appdomain.cloud')
```

```
cap= cv2.VideoCapture(0)
font = cv2.FONT_HERSHEY_PLAIN

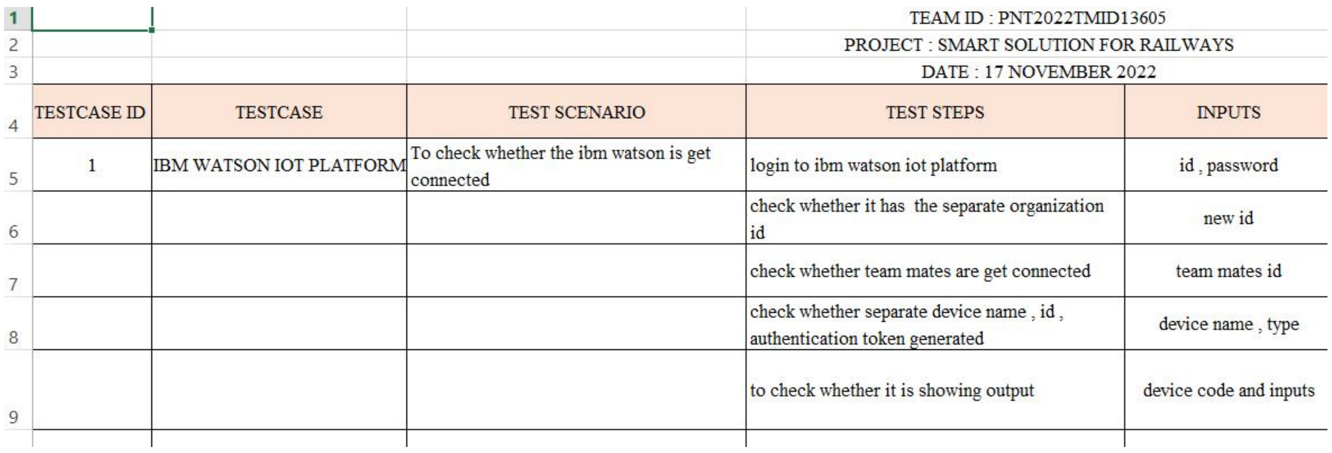
while True:
_, frame = cap.read()
decodedObjects = pyzbar.decode (frame)
for obj in decodedObjects:
#print ("Data", obj.data)
a=obj.data.decode('UTF-8')
cv2.putText(frame, "Ticket", (50, 50), font, 2, (255, 0, 0), 3)

#print (a)
try:
response = service.get_document(
db='booking',
doc_id = a
).get_result()
print (response)
time.sleep(5)
except Exception as e:
print ("Not a Valid Ticket")
time.sleep(5)

cv2.imshow("Frame",frame)
if cv2.waitKey(1) & 0xFF ==ord('q'):
break
cap.release()
cv2.destroyAllWindows()
client.disconnect()
```

8.TESTING

8.1 TEST CASES

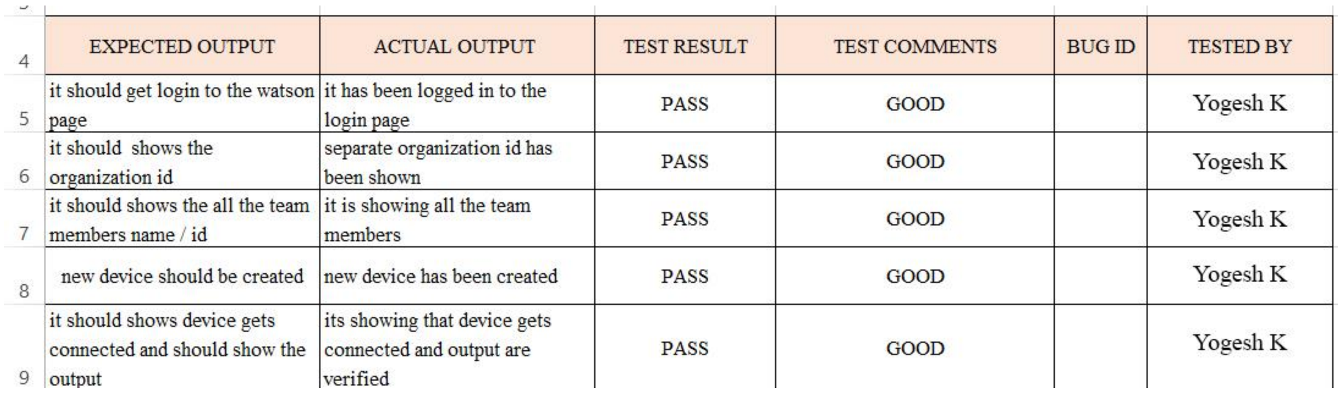


TEAM ID : PNT2022TMID13605

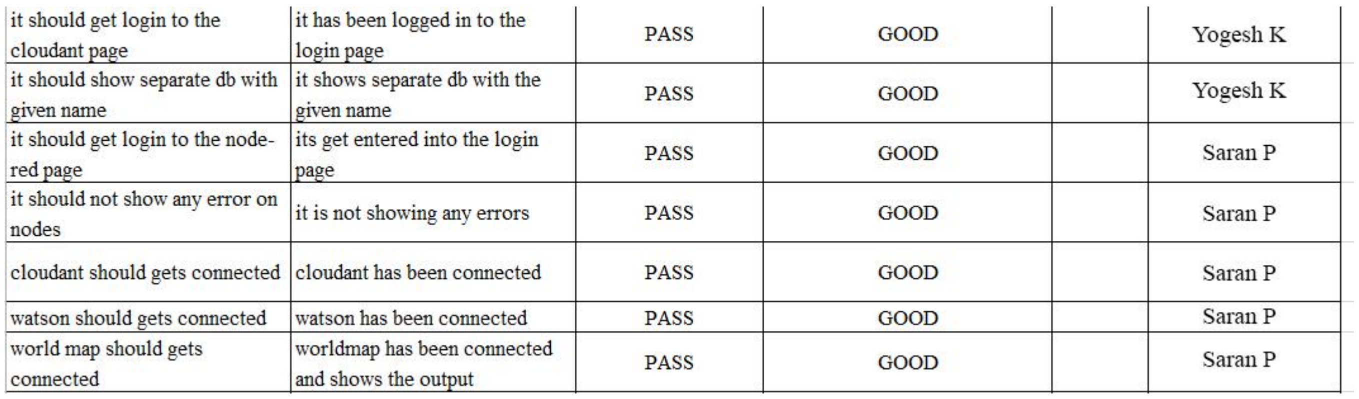
PROJECT : SMART SOLUTION FOR RAILWAYS

DATE : 17 NOVEMBER 2022

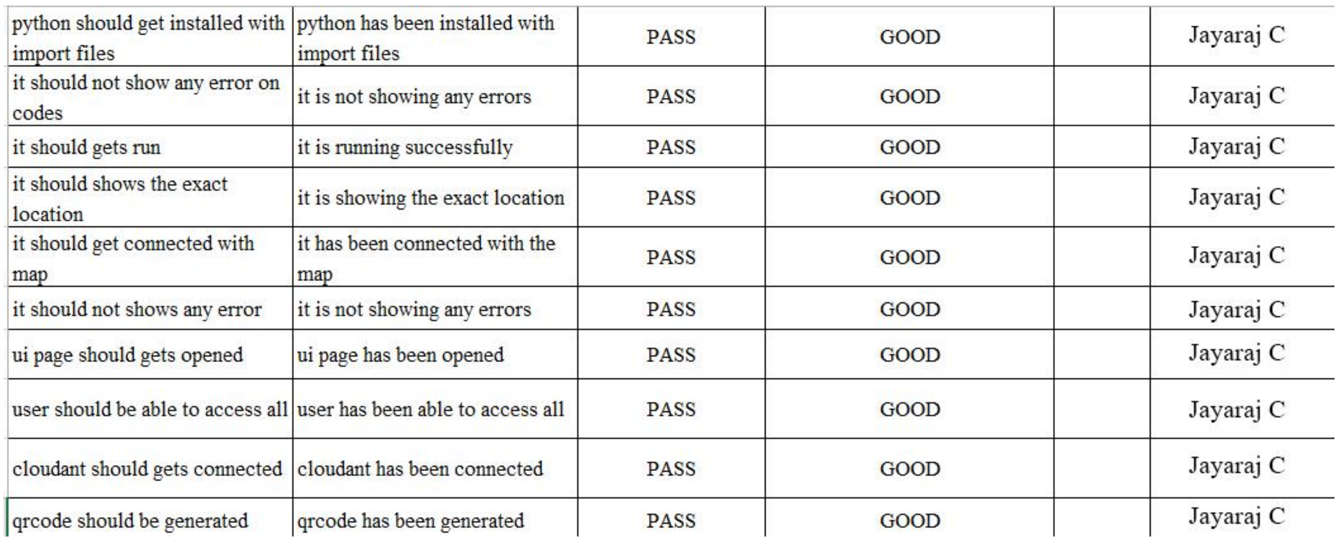
TESTCASE ID	TESTCASE	TEST SCENARIO	TEST STEPS	INPUTS
1	IBM WATSON IOT PLATFORM	To check whether the ibm watson is get connected	login to ibm watson iot platform	id , password
			check whether it has the separate organization id	new id
			check whether team mates are get connected	team mates id
			check whether separate device name , id , authentication token generated	device name , type
			to check whether it is showing output	device code and inputs



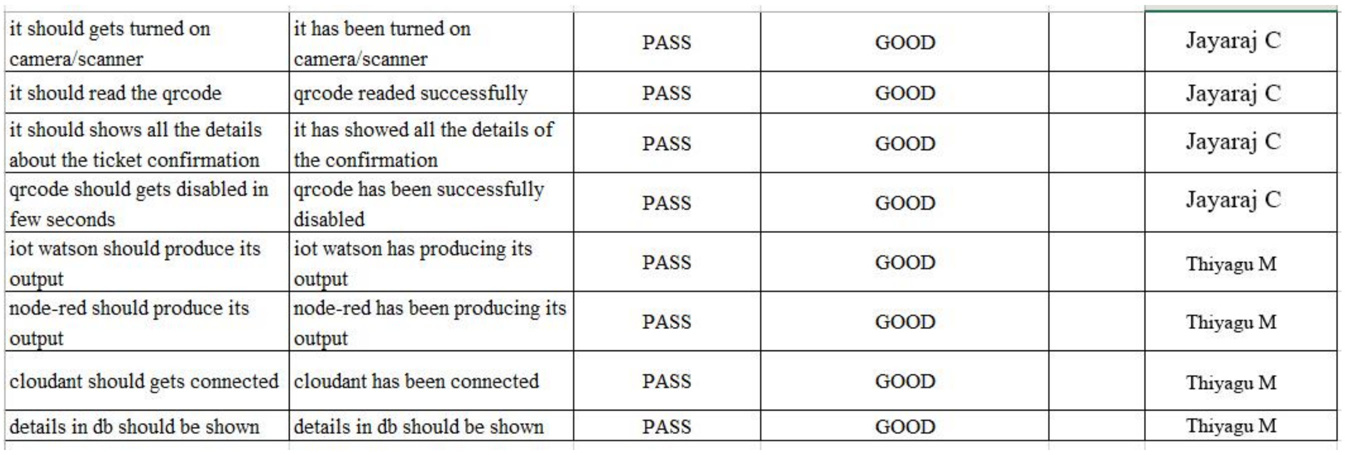
EXPECTED OUTPUT	ACTUAL OUTPUT	TEST RESULT	TEST COMMENTS	BUG ID	TESTED BY
it should get login to the watson page	it has been logged in to the login page	PASS	GOOD		Yogesh K
it should shows the organization id	separate organization id has been shown	PASS	GOOD		Yogesh K
it should shows the all the team members name / id	it is showing all the team members	PASS	GOOD		Yogesh K
new device should be created	new device has been created	PASS	GOOD		Yogesh K
it should shows device gets connected and should show the output	its showing that device gets connected and output are verified	PASS	GOOD		Yogesh K



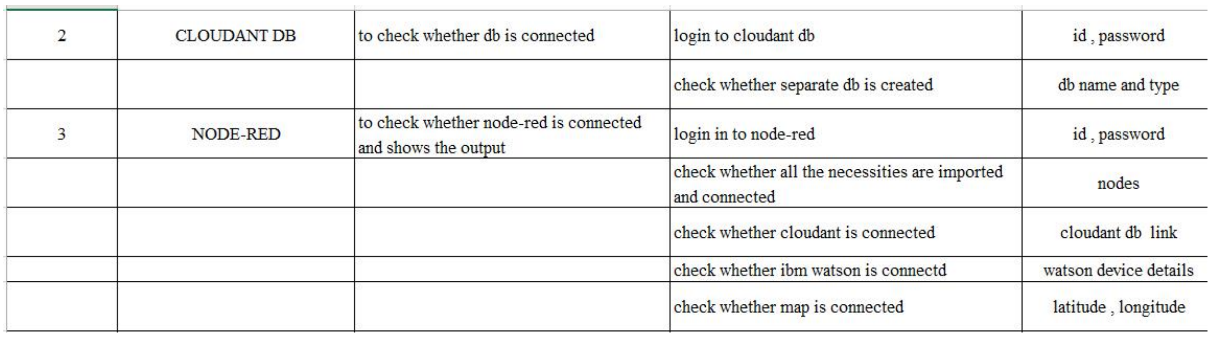
it should get login to the cloudant page	it has been logged in to the login page	PASS	GOOD		Yogesh K
it should show separate db with given name	it shows separate db with the given name	PASS	GOOD		Yogesh K
it should get login to the node-red page	its get entered into the login page	PASS	GOOD		Saran P
it should not show any error on nodes	it is not showing any errors	PASS	GOOD		Saran P
cloudant should gets connected	cloudant has been connected	PASS	GOOD		Saran P
watson should gets connected	watson has been connected	PASS	GOOD		Saran P
world map should gets connected	worldmap has been connected and shows the output	PASS	GOOD		Saran P



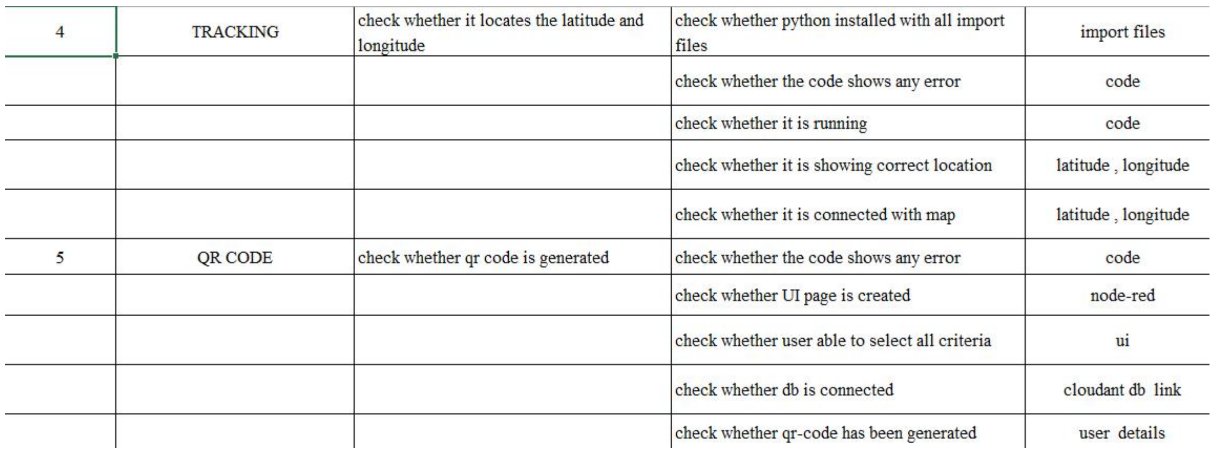
python should get installed with import files	python has been installed with import files	PASS	GOOD		Jayaraj C
it should not show any error on codes	it is not showing any errors	PASS	GOOD		Jayaraj C
it should gets run	it is running successfully	PASS	GOOD		Jayaraj C
it should shows the exact location	it is showing the exact location	PASS	GOOD		Jayaraj C
it should get connected with map	it has been connected with the map	PASS	GOOD		Jayaraj C
it should not shows any error	it is not showing any errors	PASS	GOOD		Jayaraj C
ui page should gets opened	ui page has been opened	PASS	GOOD		Jayaraj C
user should be able to access all	user has been able to access all	PASS	GOOD		Jayaraj C
cloudant should gets connected	cloudant has been connected	PASS	GOOD		Jayaraj C
qrcode should be generated	qrcode has been generated	PASS	GOOD		Jayaraj C



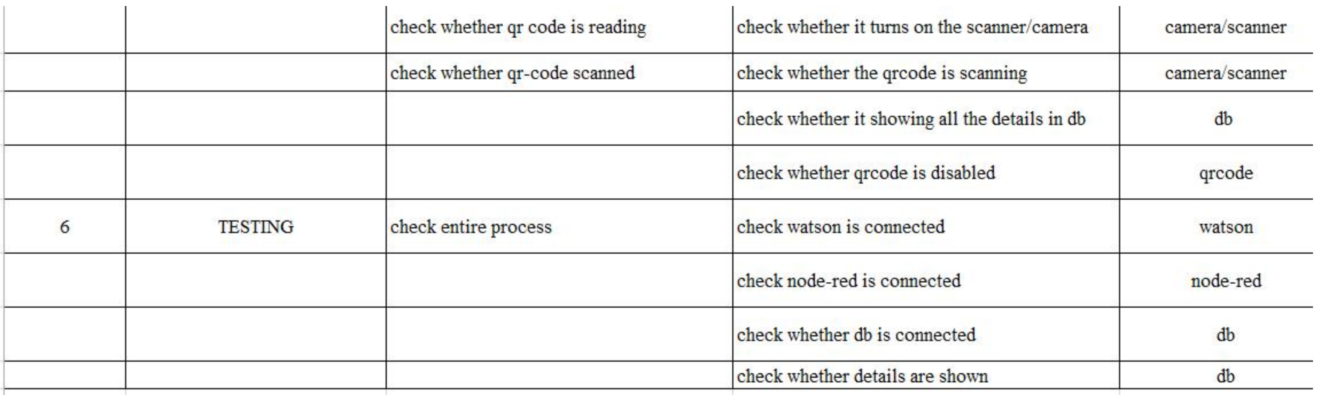
it should gets turned on camera/scanner	it has been turned on camera/scanner	PASS	GOOD		Jayaraj C
it should read the qrcode	qrcode readed successfully	PASS	GOOD		Jayaraj C
it should shows all the details about the ticket confirmation	it has showed all the details of the confirmation	PASS	GOOD		Jayaraj C
qrcode should gets disabled in few seconds	qrcode has been successfully disabled	PASS	GOOD		Jayaraj C
iot watson should produce its output	iot watson has producing its output	PASS	GOOD		Thiyagu M
node-red should produce its output	node-red has been producing its output	PASS	GOOD		Thiyagu M
cloudant should gets connected	cloudant has been connected	PASS	GOOD		Thiyagu M
details in db should be shown	details in db should be shown	PASS	GOOD		Thiyagu M



2	CLOUDANT DB	to check whether db is connected	login to cloudant db	id , password
			check whether separate db is created	db name and type
3	NODE-RED	to check whether node-red is connected and shows the output	login in to node-red	id , password
			check whether all the necessities are imported and connected	nodes
			check whether cloudant is connected	cloudant db link
			check whether ibm watson is connectd	watson device details
			check whether map is connected	latitude , longitude



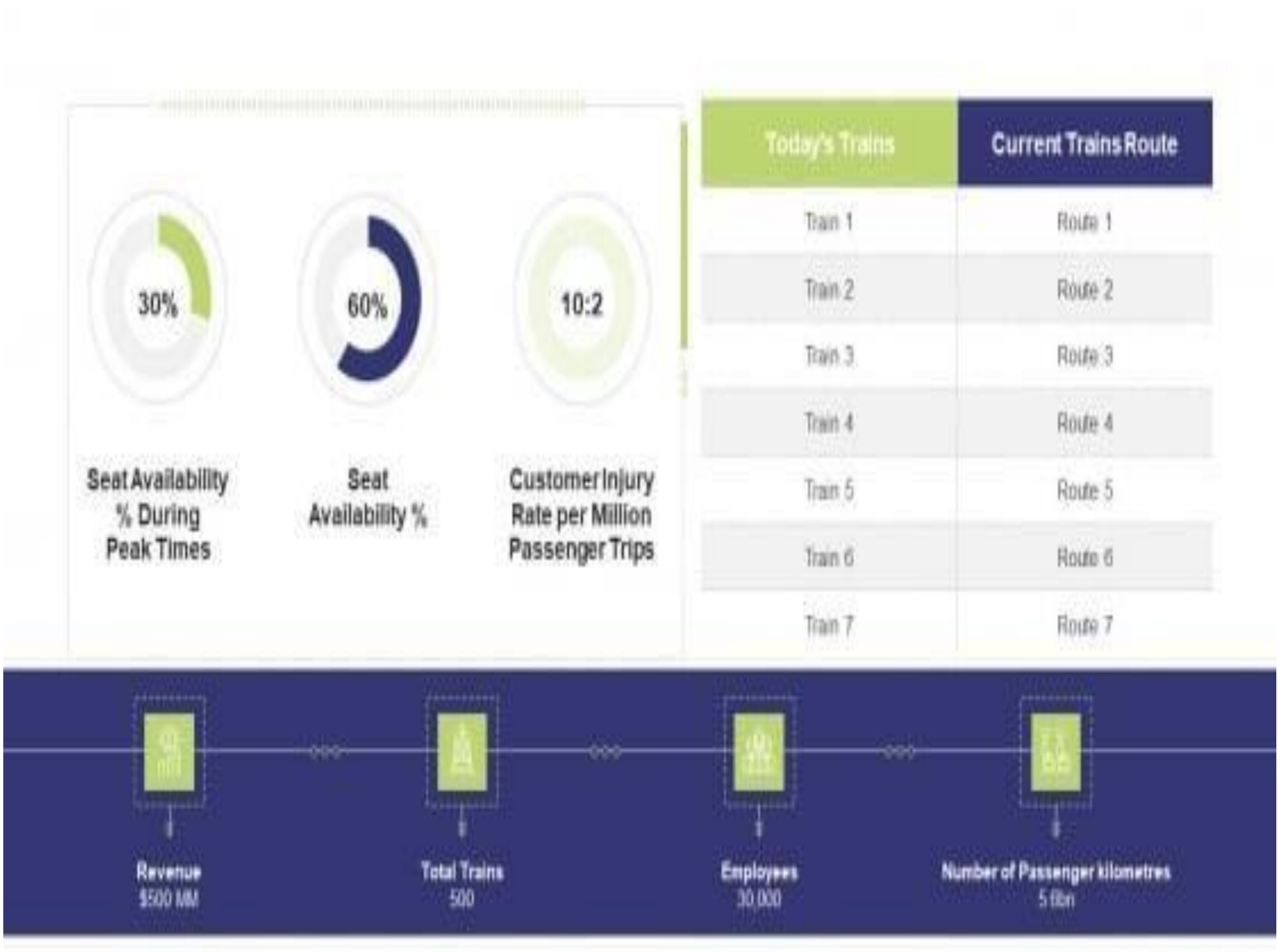
4	TRACKING	check whether it locates the latitude and longitude	check whether python installed with all import files	import files
			check whether the code shows any error	code
			check whether it is running	code
			check whether it is showing correct location	latitude , longitude
			check whether it is connected with map	latitude , longitude
5	QR CODE	check whether qr code is generated	check whether the code shows any error	code
			check whether UI page is created	node-red
			check whether user able to select all criteria	ui
			check whether db is connected	cloudant db link
			check whether qr-code has been generated	user details



		check whether qr code is reading	check whether it turns on the scanner/camera	camera/scanner
		check whether qr-code scanned	check whether the qrcode is scanning	camera/scanner
			check whether it showing all the details in db	db
			check whether qrcode is disabled	qrcode
6	TESTING	check entire process	check watson is connected	watson
			check node-red is connected	node-red
			check whether db is connected	db
			check whether details are shown	db

9.RESULTS

9.1 PERFORMANCE METRICES



Today's Trains	Current Trains Route
Train 1	Route 1
Train 2	Route 2
Train 3	Route 3
Train 4	Route 4
Train 5	Route 5
Train 6	Route 6
Train 7	Route 7

10.ADVANTAGES AND DISADVANTAGES

10.1 ADVANTAGES

- Openness – compatibility between different system modules, potentially from differentvendors;
- Orchestration – ability to manage large numbers of devices, with full visibility over them;
- Dynamic scaling – ability to scale the system according to the application needs, throughresource virtualization and cloud operation;
- Automation – ability to automate parts of the system monitoring application, leading tobetter performance and lower operation costs.

10.2 DISADVANTAGES

- Approaches to flexible, effective, efficient, and low-cost data collection for bothrailway vehicles and infrastructure monitoring, using regular trains;
- Data processing, reduction, and analysis in local controllers, and subsequent sending ofthat data to the cloud, for further processing;
- Online data processing systems, for real-time monitoring, using emergingcommunication technologies;
- Integrated, interoperable, and scalable solutions for railway systems preventivemaintenance.

11.CONCLUSION

Accidents involving the rail transportation system result in a large loss of life. Therefore, by alerting the railroad authorities in advance of any problems or cracks, so that they can be corrected and the number of accidents lowers, this technology helps in the prevention of accidents. This project is affordable. By utilising extra strategies, they can be strengthened and expanded in accordance with their applications. This device can save a great deal of lives by averting accidents. It is feasible to apply the idea on a broad scale over the long term in order to support increased standards for rail track safety and provide a productive testing environment for better future results.

12.FUTURE SCOPES

In the future, visual videos taken from the track can be monitored using CCTV systems with IP-based cameras. Additionally, it will make trains and people safer. In addition to using GPS to pinpoint the precise location of a track fault area, IP cameras can also be utilised to visually demonstrate a fault. With the use of sensors, locations on Google maps can be utilised to identify where a track is damaged.

13.APPENDIX

13.1 SOURCE PROGRAM

```
import math, random import os

import smtplib import sqlite3 import requests

from bs4 import BeautifulSoup

from django.contrib.auth.base_user import AbstractBaseUser from django.db
import models

import logging import pandas as pd import pyttsx3

from plyer import notification import time

import numpy as np

import matplotlib.pyplot as plt

from PIL import Image, ImageDraw from pickle import load,dump import
smtplib, ssl

from email.mime.text import MIMEText

from email.mime.multipart import MIMEMultipart import email

from email import encoders

from email.mime.base import MIMEBase

import attr

from flask import Blueprint, flash, redirect, request, url_for from flask.views
import MethodView

from flask_babelplus import gettext as _

from flask_login import current_user, login_required

from pluggy import HookimplMarker

from tkinter import* base = Tk()

base.geometry("500x500") base.title("registration form")

labl_0 = Label(base, text="Registration form",width=20,font=("bold", 20))

labl_0.place(x=90,y=53)
```

```
lb1= Label(base, text="Enter Name", width=10, font=("arial",12))
lb1.place(x=20, y=120)

en1= Entry(base) en1.place(x=200, y=120)

lb3= Label(base, text="Enter Email", width=10, font=("arial",12))
lb3.place(x=19, y=160)

en3= Entry(base) en3.place(x=200, y=160)

lb4= Label(base, text="Contact Number", width=13,font=("arial",12))
lb4.place(x=19, y=200)

en4= Entry(base) en4.place(x=200, y=200)

lb5= Label(base, text="Select Gender", width=15, font=("arial",12))
lb5.place(x=5, y=240)

var = IntVar()

Radiobutton(base, text="Male", padx=5,variable=var,

value=1).place(x=180, y=240)

Radiobutton(base, text="Female", padx =10,variable=var,
value=2).place(x=240,y=240)

Radiobutton(base, text="others", padx=15, variable=var,
value=3).place(x=310,y=240)

list_of_cntry = ("United States", "India", "Nepal", "Germany") cv = StringVar()

drplist= OptionMenu(base, cv, *list_of_cntry) drplist.config(width=15)

cv.set("United States")

lb2= Label(base, text="Select Country", width=13,font=("arial",12))
lb2.place(x=14,y=280)

drplist.place(x=200, y=275)

lb6= Label(base, text="Enter Password", width=13,font=("arial",12))
lb6.place(x=19, y=320)

en6= Entry(base, show='*') en6.place(x=200, y=320)

lb7= Label(base, text="Re-Enter Password", width=15,font=("arial",12))

lb7.place(x=21, y=360)

en7 =Entry(base, show='*') en7.place(x=200, y=360)

Button(base, text="Register", width=10).place(x=200,y=400) base.mainloop()
```

```
def generateOTP() :

# Declare a digits variable # which stores all digits digits = "0123456789" OTP
= ""

# length of password can be changed # by changing value in range

for i in range(4) :

OTP += digits[math.floor(random.random() * 10)] return OTP

# Driver code

If name== "main" :

print("OTP of 4 digits:", generateOTP()) digits="0123456789"

OTP=""

for i in range(6): OTP+=digits[math.floor(random.random()*10)]

otp = OTP + " is your OTP" msg= otp

s = smtplib.SMTP('smtp.gmail.com', 587) s.starttls()

s.login("Your Gmail Account", "You app password") emailid = input("Enter
your email: ") s.sendmail('&&&&&&&&&&&',emailid,msg)

a = input("Enter Your OTP >>: ")

if a == OTP: print("Verified")

else:

print("Please Check your OTP again") root = Tk()

root.title("Python: Simple Login Application") width = 400

height = 280

screen_width = root.winfo_screenwidth() screen_height =
root.winfo_screenheight() x = (screen_width/2) - (width/2)

y = (screen_height/2) - (height/2) root.geometry("%dx%d+%d+%d" % (width,
height, x, y)) root.resizable(0, 0)

USERNAME = StringVar() PASSWORD = StringVar()

Top = Frame(root, bd=2, relief=RIDGE) Top.pack(side=TOP, fill=X)

Form = Frame(root, height=200) Form.pack(side=TOP, pady=20)

lbl_title = Label(Top, text = "Python: Simple Login Application", font=('arial',
15))
```

```
lbl_title.pack(fill=X)

lbl_username = Label(Form, text = "Username:", font=('arial', 14), bd=15)

lbl_username.grid(row=0, sticky="e")

lbl_password = Label(Form, text = "Password:", font=('arial', 14), bd=15)

lbl_password.grid(row=1, sticky="e") lbl_text = Label(Form)

lbl_text.grid(row=2, columnspan=2)

username = Entry(Form, textvariable=USERNAME, font=(14))
username.grid(row=0, column=1)

password = Entry(Form, textvariable=PASSWORD, show="*", font=(14))

password.grid(row=1, column=1) def Database():

global conn, cursor

conn = sqlite3.connect("pythontut.db") cursor = conn.cursor()

cursor.execute("CREATE TABLE IF NOT EXISTS `member` (mem_id
INTEGER NOT NULL PRIMARY KEY

AUTOINCREMENT, username TEXT, password TEXT)")
cursor.execute("SELECT * FROM `member` WHERE `username` =

'admin' AND `password` = 'admin'")

if cursor.fetchone() is None:

cursor.execute("INSERT INTO `member` (username, password)
VALUES('admin', 'admin')")

conn.commit()

def Login(event=None): Database()

if USERNAME.get() == "" or PASSWORD.get() == "":

lbl_text.config(text="Please complete the required field!", fg="red") else:

cursor.execute("SELECT * FROM `member` WHERE `username`

= ? AND `password` = ?", (USERNAME.get(), PASSWORD.get())) if
cursor.fetchone() is not None:

HomeWindow() USERNAME.set("")

PASSWORD.set("")

lbl_text.config(text="")
```

```
else:

lbl_text.config(text="Invalid username or password", fg="red")
USERNAME.set("")

PASSWORD.set("")

cursor.close() conn.close()

btn_login = Button(Form, text="Login", width=45, command=Login)
btn_login.grid(pady=25, row=3, columnspan=2) btn_login.bind('<Return>',
Login)

def HomeWindow(): global Home root.withdraw() Home = Toplevel()

Home.title("Python: Simple Login Application") width = 600

height = 500

screen_width = root.winfo_screenwidth() screen_height =
root.winfo_screenheight() x = (screen_width/2) - (width/2)

y = (screen_height/2) - (height/2) root.resizable(0, 0)

Home.geometry("%dx%d+%d+%d" % (width, height, x, y)) lbl_home =
Label(Home, text="Successfully Login!", font=('times new

roman', 20)).pack()

btn_back = Button(Home, text='Back', command=Back).pack(pady=20, fill=X)

def Back():

Home.destroy() root.deiconify()

def getdata(url):

r = requests.get(url) return r.text

# input by geek from_Station_code = "GAYA" from_Station_name = "GAYA"

To_station_code = "PNBE" To_station_name = "PATNA" # url

url = "https://www.railyatri.in/booking/trains-between-
stations?from_code="+from_Station_code+"&from_name="+from_Stat
ion_name+"+JN+&journey_date=+Wed&src=tbs&to_code=" + \

To_station_code+"&to_name="+To_station_name + \ "+JN+&user_id=-

1603228437&user_token=355740&utm_source=dwebsearch_tbs_search_
```

```
trains"
# pass the url
# into getdata function htmldata = getdata(url)
soup = BeautifulSoup(htmldata, 'html.parser')
# find the Html tag # with find()
# and convert into string
data_str = ""
for item in soup.find_all("div", class_="col-xs-12 TrainSearchSection"):
data_str = data_str + item.get_text()
result = data_str.split("\n")
print("Train between "+from_Station_name+" and "+To_station_name)
print("")
# Display the result for item in result:
if item != "": print(item)
print("\n\nTicket Booking System\n") restart = ('Y')
while restart != ('N','NO','n','no'):
print("1.Check PNR status") print("2.Ticket Reservation")
option = int(input("\nEnter your option : "))
if option == 1:
print("Your PNR status is t3") exit(0)"))
elif option == 2:
people = int(input("\nEnter no. of Ticket you want :
name_l = [] age_l = [] sex_l = []
 for p in range(people):
name = str(input("\nName : ")) name_l.append(name)
age = int(input("\nAge : ")) age_l.append(age)
sex = str(input("\nMale or Female : ")) sex_l.append(sex)
"))
 restart = str(input("\nDid you forgot someone? y/n:
```

```
if restart in ('y','YES','yes','Yes'): restart = ('Y')
 else :
x = 0
print("\nTotal Ticket : ",people) for p in range(1,people+1):
print("Ticket : ",p)
print("Name : ", name_l[x])
print("Age : ", age_l[x])
print("Sex : ",sex_l[x]) x += 1
class User(AbstractBaseUser): """
User model. """
USERNAME_FIELD = "email"
REQUIRED_FIELDS = ["first_name", "last_name"] email =
models.EmailField(
verbose_name="E-mail",
unique=True
)
first_name = models.CharField( verbose_name="First name", max_length=30
)
last_name = models.CharField( verbose_name="Last name", max_length=40
)
city = models.CharField( verbose_name="City", max_length=40
)
stripe_id = models.CharField( verbose_name="Stripe ID", unique=True,
max_length=50, blank=True,
null=True
)
objects = UserManager() @property
def get_full_name(self):
return f"{self.first_name} {self.last_name}"
```

```
class Meta:

verbose_name = "User" verbose_name_plural = "Users"

class Profile(models.Model): """

User's profile. """

phone_number = models.CharField( verbose_name="Phone number",
max_length=15)

 date_of_birth = models.DateField( verbose_name="Date of birth"

)

postal_code = models.CharField( verbose_name="Postal code",
max_length=10,

blank=True

)

address = models.CharField( verbose_name="Address", max_length=255,
blank=True

)

class Meta: abstract = True

class UserProfile(Profile): """

User's profile model. """

user = models.OneToOneField(

to=User, on_delete=models.CASCADE, related_name="profile",

)

group = models.CharField( verbose_name="Group type",
choices=GroupTypeChoices.choices(), max_length=20,
default=GroupTypeChoices.EMPLOYEE.name,

)

Def str(self): return self.user.email

class Meta:

# user 1 - employer

user1, _ = User.objects.get_or_create( email="foo@bar.com",
first_name="Employer", last_name="Testowy", city="Białystok",
)
user1.set_unusable_password() group_name = "employer"
_profile1, _ = UserProfile.objects.get_or_create( user=user1,
date_of_birth=datetime.now() - timedelta(days=6600),
group=GroupTypeChoices(group_name).name, address="Myśliwska 14",
postal_code="15-569",
phone_number="+48100200300",
)
# user2 - employee
user2, _ = User.objects.get_or_create() email="bar@foo.com",
first_name="Employee", last_name="Testowy", city="Białystok",
)
user2.set_unusable_password() group_name = "employee"
_profile2, _ = UserProfile.objects.get_or_create() user=user2,
date_of_birth=datetime.now() - timedelta(days=7600),
group=GroupTypeChoices(group_name).name, address="Myśliwska 14",
postal_code="15-569", phone_number="+48200300400",
)
response_customer = stripe.Customer.create() email=user.email,
description=f"EMPLOYER - {user.get_full_name}", name=user.get_full_name,
phone=user.profile.phone_number,
)
user1.stripe_id = response_customer.stripe_id user1.save()
mcc_code, url = "1520", "https://www.softserveinc.com/" response_ca =
stripe.Account.create()
type="custom",
country="PL", email=user2.email, default_currency="pln",
business_type="individual",
settings={"payouts": {"schedule": {"interval": "manual", }}},
requested_capabilities=["card_payments", "transfers", ],
business_profile={"mcc": mcc_code, "url": url},
individual={
"first_name": user2.first_name, "last_name": user2.last_name, "email":
user2.email,
"dob": {
"day": user2.profile.date_of_birth.day, "month":
user2.profile.date_of_birth.month, "year": user2.profile.date_of_birth.year,
},
"phone": user2.profile.phone_number, "address": {
"city": user2.city,
"postal_code": user2.profile.postal_code, "country": "PL",
"line1": user2.profile.address,
},
},
)
user2.stripe_id = response_ca.stripe_id user2.save()
tos_acceptance = {"date": int(time.time()), "ip": user_ip},
stripe.Account.modify(user2.stripe_id, tos_acceptance=tos_acceptance)
passport_front = stripe.File.create(
purpose="identity_document", file=_file, # ContentFile object
stripe_account=user2.stripe_id,
)
individual = { "verification": {
"document": {"front": passport_front.get("id"),}, "additional_document":
{"front": passport_front.get("id"),},
}
}
stripe.Account.modify(user2.stripe_id, individual=individual)
new_card_source = stripe.Customer.create_source(user1.stripe_id,
source=token)
```

```
stripe.SetupIntent.create( payment_method_types=["card"],
customer=user1.stripe_id, description="some description",
payment_method=new_card_source.id,

)

payment_method = stripe.Customer.retrieve(user1.stripe_id).default_source

payment_intent = stripe.PaymentIntent.create( amount=amount,

currency="pln", payment_method_types=["card"], capture_method="manual",
customer=user1.stripe_id, # customer payment_method=payment_method,
application_fee_amount=application_fee_amount,

transfer_data={"destination": user2.stripe_id}, # connect account
description=description,

metadata=metadata,

)

payment_intent_confirm = stripe.PaymentIntent.confirm(
payment_intent.stripe_id, payment_method=payment_method

)

stripe.PaymentIntent.capture(

payment_intent.id, amount_to_capture=amount

)

stripe.Balance.retrieve(stripe_account=user2.stripe_id)

stripe.Charge.create( amount=amount, currency="pln", source=user2.stripe_id,
description=description

)

stripe.PaymentIntent.cancel(payment_intent.id)

unique_together = ("user", "group") @attr.s(frozen=True, cmp=False,
hash=False, repr=True) class UserSettings(MethodView):

form = attr.ib(factory=settings_form_factory) settings_update_handler =
attr.ib(factory=settings_update_handler)

decorators = [login_required] def get(self):

return self.render()

def post(self):
```

```
if self.form.validate_on_submit(): try:

self.settings_update_handler.apply_changeset( current_user,
self.form.as_change()

)

except StopValidation as e:


self.form.populate_errors(e.reasons) return self.render()

except PersistenceError:

logger.exception("Error while updating user settings") flash(_("Error while
updating user settings"), "danger") return self.redirect()

flash(_("Settings updated."), "success") return self.redirect()

return self.render()

def render(self):

return render_template("user/general_settings.html", form=self.form)

def redirect(self):

return redirect(url_for("user.settings"))

@attr.s(frozen=True, hash=False, cmp=False, repr=True) class
ChangePassword(MethodView):

form = attr.ib(factory=change_password_form_factory)
password_update_handler =

attr.ib(factory=password_update_handler)

decorators = [login_required]

def get(self):

return self.render()

def post(self):

if self.form.validate_on_submit(): try:

self.password_update_handler.apply_changeset( current_user,
self.form.as_change()

)
```

```
except StopValidation as e: self.form.populate_errors(e.reasons) return
self.render()

except PersistenceError:

logger.exception("Error while changing password") flash(_("Error while
changing password"), "danger") return self.redirect()

flash(_("Password updated."), "success") return self.redirect()

return self.render()


def render(self):

return render_template("user/change_password.html", form=self.form)

def redirect(self):

return redirect(url_for("user.change_password"))

@attr.s(frozen=True, cmp=False, hash=False, repr=True) class
ChangeEmail(MethodView):

form = attr.ib(factory=change_email_form_factory) update_email_handler =
attr.ib(factory=email_update_handler) decorators = [login_required]

def get(self):

return self.render()

def post(self):

if self.form.validate_on_submit(): try:

self.update_email_handler.apply_changeset( current_user,
self.form.as_change()

)

except StopValidation as e: self.form.populate_errors(e.reasons) return
self.render()

except PersistenceError:

logger.exception("Error while updating email") flash(_("Error while updating
email"), "danger") return self.redirect()

flash(_("Email address updated."), "success") return self.redirect()

return self.render()
```

```
def render(self):

return render_template("user/change_email.html", form=self.form)

def redirect(self):

return redirect(url_for("user.change_email")) def berth_type(s):

if s>0 and s<73:

if s % 8 == 1 or s % 8 == 4: print (s), "is lower berth"

elif s % 8 == 2 or s % 8 == 5: print (s), "is middle berth" elif s % 8 == 3 or s %
8 == 6:

print (s), "is upper berth" elif s % 8 == 7:

print (s), "is side lower berth" else:

print (s), "is side upper berth"

else:

print (s), "invalid seat number"

# Driver code s = 10

berth_type(s)             # fxn call for berth type

s = 7

berth_type(s)             # fxn call for berth type

s = 0

berth_type(s)             # fxn call for berth type class Ticket:

counter=0

def                       init     (self,passenger_name,source,destination): self.
                          passenger_name=passenger_name

self.                     source=source

self.                     destination=destination self.Counter=Ticket.counter
Ticket.counter+=1


def validate_source_destination(self):

if (self.                 source=="Delhi" and (self.
                          destination=="Pune" or self.
                          destination=="Mumbai" or self.
```

```
                                   destination=="Chennai" or self.
                                   destination=="Kolkata")):
return True else:
return False
def generate_ticket(self ): if True:

 ticket_id=self.__source[0]+self.__destination[0]+"0"+str(self.Counter) print(
"Ticket id will be:",       ticket_id)
else:
return False
def get_ticket_id(self): return self.ticket_id
def get_passenger_name(self): return self.__passenger_name
def get_source(self):
if self.source=="Delhi": return self.source
else:
print("you have written invalid soure option") return None
def get_destination(self):
if self.destination=="Pune": return self.       destination
elif self.destination=="Mumbai": return self. destination

elif self.destination=="Chennai": return self. destination
elif self.destination=="Kolkata": return self.  destination
else:
return None
# user define function # Scrape the data
def getdata(url):
r = requests.get(url) return r.text
# input by geek
train_name = "03391-rajgir-new-delhi-clone-special-rgd-to-ndls"
```

```
# url
url = "https://www.railyatri.in/live-train-status/"+train_name
# pass the url
# into getdata function htmldata = getdata(url)
soup = BeautifulSoup(htmldata, 'html.parser')

# traverse the live status from # this Html code
data = []
for item in soup.find_all('script', type="application/ld+json"):
data.append(item.get_text())
# convert into dataframe df = pd.read_json(data[2])
# display this column of # dataframe
print(df["mainEntity"][0]['name'])
print(df["mainEntity"][0]['acceptedAnswer']['text'])
Speak method
def Speak(self, audio):
# Calling the initial constructor # of pyttsx3
engine = pyttsx3.init('sapi5')
# Calling the getter method
voices = engine.getProperty('voices')
# Calling the setter method engine.setProperty('voice', voices[1].id)
engine.say(audio) engine.runAndWait()
def Take_break():
Speak("Do you want to start sir?") question = input()
if "yes" in question:
Speak("Starting Sir")
Sir.")
mins",
as you have" affect your eyes",

if "no" in question:

Speak("We will automatically start after 5 Mins

time.sleep(5*60) Speak("Starting Sir")

# A notification we will held that

# Let's Start sir and with a message of # will tell you to take a break after 45 #
mins for 10 seconds

while(True): notification.notify(title="Let's Start sir",

message="will tell you to take a break after 45 timeout=10)

# For 45 min the will be no notification but # after 45 min a notification will
pop up. time.sleep(0.5*60)

Speak("Please Take a break Sir")

notification.notify(title="Break Notification", message="Please do use your
device after sometime

"been continuously using it for 45 mins and it will timeout=10)

# Driver's Code

If name== '__main        ':

Take_break() data_path = 'data.csv'

data = pd.read_csv(data_path, names=['LATITUDE', 'LONGITUDE'], sep=',')

gps_data = tuple(zip(data['LATITUDE'].values, data['LONGITUDE'].values))

image = Image.open('map.png', 'r') # Load map image. img_points = []

for d in gps_data:

x1, y1 = scale_to_img(d, (image.size[0], image.size[1])) # Convert GPS
coordinates to image coordinates.

img_points.append((x1, y1)) draw = ImageDraw.Draw(image)

draw.line(img_points, fill=(255, 0, 0), width=2) # Draw converted records to
the map image.

image.save('resultMap.png')

x_ticks = map(lambda x: round(x, 4), np.linspace(lon1, lon2, num=7)) y_ticks =
map(lambda x: round(x, 4), np.linspace(lat1, lat2, num=8))
```

```
y_ticks = sorted(y_ticks, reverse=True) # y ticks must be reversed due to
conversion to image coordinates.

fig, axis1 = plt.subplots(figsize=(10, 10))

axis1.imshow(plt.imread('resultMap.png')) # Load the image to matplotlib plot.

axis1.set_xlabel('Longitude')

 axis1.set_ylabel('Latitude') axis1.set_xticklabels(x_ticks)
axis1.set_yticklabels(y_ticks) axis1.grid()

plt.show() class tickets:

def init(self): self.no_ofac1stclass=0 self.totaf=0 self.no_ofac2ndclass=0
self.no_ofac3rdclass=0 self.no_ofsleeper=0 self.no_oftickets=0 self.name="

self.age=" self.resno=0 self.status="

def ret(self): return(self.resno)

def retname(self): return(self.name)

def display(self): f=0

fin1=open("tickets.dat","rb") if not fin1:

print "ERROR" else:

print

n=int(raw_input("ENTER PNR NUMBER : ")) print "\n\n"

print ("FETCHING DATA . . .".center(80)) time.sleep(1)

print

print('PLEASE WAIT...!!'.center(80)) time.sleep(1)

os.system('cls') try:

while True: tick=load(fin1) if(n==tick.ret()):

f=1

print "="*80

print("PNR STATUS".center(80)) print"="*80

print

print "PASSENGER'S NAME :",tick.name print

print "PASSENGER'S AGE :",tick.age print
print "PNR NO :",tick.resno print

print "STATUS :",tick.status print

print "NO OF SEATS BOOKED : ",tick.no_oftickets print

except:

pass fin1.close() if(f==0):

print


print "WRONG PNR NUMBER..!!"

print

def pending(self): self.status="WAITING LIST" print "PNR NUMBER
:",self.resno print

time.sleep(1.2)

print "STATUS = ",self.status print

print "NO OF SEATS BOOKED : ",self.no_oftickets print

def confirmation (self): self.status="CONFIRMED"

print "PNR NUMBER : ",self.resno print

time.sleep(1.5)

print "STATUS = ",self.status print

def cancellation(self): z=0

f=0 fin=open("tickets.dat","rb") fout=open("temp.dat","ab") print

r= int(raw_input("ENTER PNR NUMBER : ")) try:

while(True): tick=load(fin) z=tick.ret() if(z!=r):

dump(tick,fout) elif(z==r):

f=1

except:

pass fin.close() fout.close()

os.remove("tickets.dat") os.rename("temp.dat","tickets.dat") if (f==0):

print

print "NO SUCH RESERVATION NUMBER FOUND"
print time.sleep(2) os.system('cls')
else:
print
print "TICKET CANCELLED" print"RS.600 REFUNDED        "
def reservation(self):
trainno=int(raw_input("ENTER THE TRAIN NO:")) z=0
f=0 fin2=open("tr1details.dat") fin2.seek(0)
if not fin2:
print "ERROR" else:
try:
while True:
n=int(raw_input("ENTER PNR NUMBER : ")) print "\n\n"
print ("FETCHING DATA . . .".center(80)) time.sleep(1)
print
print('PLEASE WAIT...!!'.center(80)) time.sleep(1)
os.system('cls') try:
while True: tick=load(fin1) if(n==tick.ret()):
f=1
print "="*80
print("PNR STATUS".center(80)) print"="*80
print
 print "PASSENGER'S NAME :",tick.name print
print "PASSENGER'S AGE :",tick.age print
print "PNR NO :",tick.resno print
print "STATUS :",tick.status print
print "NO OF SEATS BOOKED : ",tick.no_oftickets print
except:
pass fin1.close() if(f==0):
```

```
print
print "WRONG PNR NUMBER..!!"
print
def pending(self): self.status="WAITING LIST" print "PNR NUMBER
:",self.resno print
time.sleep(1.2)
print "STATUS = ",self.status print
print "NO OF SEATS BOOKED : ",self.no_oftickets print
def confirmation (self): self.status="CONFIRMED"
print "PNR NUMBER : ",self.resno print
time.sleep(1.5)
print "STATUS = ",self.status print
def cancellation(self): z=0
f=0 fin=open("tickets.dat","rb") fout=open("temp.dat","ab") print
r= int(raw_input("ENTER PNR NUMBER : ")) try:
while(True): tick=load(fin) z=tick.ret() if(z!=r):
dump(tick,fout) elif(z==r):
f=1
except:
pass fin.close() fout.close()
os.remove("tickets.dat") os.rename("temp.dat","tickets.dat") if (f==0):
print
print "NO SUCH RESERVATION NUMBER FOUND"
print time.sleep(2) os.system('cls')
else:
print
print "TICKET CANCELLED" print"RS.600 REFUNDED        "
def reservation(self):
trainno=int(raw_input("ENTER THE TRAIN NO:")) z=0
```

```
f=0 fin2=open("tr1details.dat") fin2.seek(0)

if not fin2:

print "ERROR" else:

try:

while True: tr=load(fin2) z=tr.gettrainno() n=tr.gettrainname() if (trainno==z):

print

print "TRAIN NAME IS : ",n

f=1 print

print "-"*80 no_ofac1st=tr.getno_ofac1stclass()
no_ofac2nd=tr.getno_ofac2ndclass() no_ofac3rd=tr.getno_ofac3rdclass()
no_ofsleeper=tr.getno_ofsleeper()

if(f==1): fout1=open("tickets.dat","ab")

NAME ")

print

self.name=raw_input("ENTER THE PASSENGER'S

print

self.age=int(raw_input("PASSENGER'S AGE : ")) print

print"\t\t SELECT A CLASS YOU WOULD LIKE TO

TRAVEL IN :- "

print "1.AC FIRST CLASS"

print

print "2.AC SECOND CLASS"

print

print "3.AC THIRD CLASS"

print

print "4.SLEEPER CLASS"

print

c=int(raw_input("\t\t\tENTER YOUR CHOICE = ")) os.system('cls')

amt1=0 if(c==1):
```

```
self.no_oftickets=int(raw_input("ENTER NO_OF FIRST CLASS AC SEATS
TO BE BOOKED : "))
i=1 while(i<=self.no_oftickets):
self.totaf=self.totaf+1 amt1=1000*self.no_oftickets i=i+1
print
print "PROCESSING. .",
time.sleep(0.5)
print ".", time.sleep(0.3) print'.' time.sleep(2) os.system('cls')
print "TOTAL AMOUNT TO BE PAID = ",amt1
self.resno=int(random.randint(1000,2546)) x=no_ofac1st-self.totaf
print if(x>0):
self.confirmation() dump(self,fout1) break
else:
self.pending() dump(tick,fout1) break
elif(c==2): self.no_oftickets=int(raw_input("ENTER NO_OF
SECOND CLASS AC SEATS TO BE BOOKED : "))
i=1
def menu(): tr=train() tick=tickets() print
print "WELCOME TO PRAHIT AGENCY".center(80)
while True:
 print
print "="*80
print " \t\t\t\t RAILWAY" print
print "="*80 print
print "\t\t\t1. **UPDATE TRAIN DETAILS." print
print "\t\t\t2. TRAIN DETAILS. " print
print "\t\t\t3. RESERVATION OF TICKETS." print
print "\t\t\t4. CANCELLATION OF TICKETS. "
print
```

```
print "\t\t\t5. DISPLAY PNR STATUS." print

print "\t\t\t6. QUIT." print"** - office use      "

ch=int(raw_input("\t\t\tENTER YOUR CHOICE : ")) os.system('cls')

print "\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\t\t\t\t\t\t\tLOADI
NG. .",

time.sleep(1) print ("."), time.sleep(0.5) print (".") time.sleep(2) os.system('cls')
if ch==1:

j="*****" r=raw_input("\n\n\n\n\n\n\n\n\n\n\n\t\t\t\tENTER THE

PASSWORD: ")

os.system('cls') if (j==r):

x='y'

while (x.lower()=='y'): fout=open("tr1details.dat","ab") tr.getinput()

dump(tr,fout) fout.close()

print"\n\n\n\n\n\n\n\n\n\n\n\n\t\t\tUPDATING TRAIN LIST PLEASE WAIT . .",

time.sleep(1) print ("."), time.sleep(0.5) print ("."), time.sleep(2) os.system('cls')

print "\n\n\n\n\n\n\n\n\n\n\n\n"

x=raw_input("\t\tDO YOU WANT TO ADD ANY MORE TRAINS DETAILS
? ")

os.system('cls') continue

elif(j<>r): print"\n\n\n\n\n"

print "WRONG PASSWORD".center(80) elif ch==2:

fin=open("tr1details.dat",'rb') if not fin:

print "ERROR" tick.display()

elif ch==6: quit()

raw_input("PRESS ENTER TO GO TO BACK

MENU".center(80))

os.system('cls')

menu()

sender_email = "my@gmail.com" receiver_email = "your@gmail.com"
```

```
password = input("Type your password and press enter:")

message = MIMEMultipart("alternative") message["Subject"] = "multipart test"
message["From"] = sender_email message["To"] = receiver_email

# Create the plain-text and HTML version of your message text = """\

Hi,

How are you?

Real Python has many great tutorials: www.realpython.com"""

html = """\

<html>

<body>

<p>Hi,<br>

How are you?<br>

<a href="http://www.realpython.com">Real Python</a> has many great
tutorials.

</p>

</body>

</html> """

# Turn these into plain/html MIMEText objects part1 = MIMEText(text,
"plain")

part2 = MIMEText(html, "html")

# Add HTML/plain-text parts to MIMEMultipart message # The email client
will try to render the last part first message.attach(part1)

message.attach(part2)

# Create secure connection with server and send email context =
ssl.create_default_context()

with smtplib.SMTP_SSL("smtp.gmail.com", 465, context=context) as server:

server.login(sender_email, password) server.sendmail(

sender_email, receiver_email, message.as_string()

)

subject = "An email with attachment from Python"
```

```
body = "This is an email with attachment sent from Python" sender_email =
"my@gmail.com"

receiver_email = "your@gmail.com"

password = input("Type your password and press enter:")

# Create a multipart message and set headers message = MIMEMultipart()
message["From"] = sender_email message["To"] = receiver_email
message["Subject"] = subject

message["Bcc"] = receiver_email # Recommended for mass emails

# Add body to email message.attach(MIMEText(body, "plain"))

filename = "document.pdf" # In same directory as script # Open PDF file in
binary mode

with open(filename, "rb") as attachment:

# Add file as application/octet-stream

# Email client can usually download this automatically as attachment part =
MIMEBase("application", "octet-stream") part.set_payload(attachment.read())

# Encode file in ASCII characters to send by email
encoders.encode_base64(part)

# Add header as key/value pair to attachment part part.add_header(

"Content-Disposition", f"attachment; filename= {filename}",

)

# Add attachment to message and convert message to string
message.attach(part)

text = message.as_string()

# Log in to server using secure context and send email context =
ssl.create_default_context()

with smtplib.SMTP_SSL("smtp.gmail.com", 465, context=context) as server:

server.login(sender_email, password) server.sendmail(sender_email,
receiver_email, text)

api_key = "Your_API_key"

# base_url variable to store url

base_url = "https://api.railwayapi.com/v2/pnr-status/pnr/"
```

```
# Enter valid pnr_number pnr_number = "6515483790"
# Stores complete url address
complete_url = base_url + pnr_number + "/apikey/" + api_key + "/"
# get method of requests module # return response object
response_ob = requests.get(complete_url)
# json method of response object convert
# json format data into python format data result = response_ob.json()
# now result contains list # of nested dictionaries
if result["response_code"] == 200:
# train name is extracting
# from the result variable data train_name = result["train"]["name"]
# train number is extracting from # the result variable data
train_number = result["train"]["number"]
# from station name is extracting # from the result variable data
from_station = result["from_station"]["name"]
# to_station name is extracting from # the result variable data
to_station = result["to_station"]["name"]
# boarding point station name is
# extracting from the result variable data boarding_point =
result["boarding_point"]["name"]
# reservation upto station name is
# extracting from the result variable data reservation_upto =
result["reservation_upto"]["name"]
# store the value or data of "pnr" # key in pnr_num variable pnr_num =
result["pnr"]
# store the value or data of "doj" key # in variable date_of_journey variable
date_of_journey = result["doj"]
# store the value or data of
# "total_passengers" key in variable total_passengers = reult["total_passengers"]
# store the value or data of "passengers" # key in variable passengers_list
passengers_list = result["passengers"]
# store the value or data of
# "chart_prepared" key in variable chart_prepared = result["chart_prepared"]
# print following values
print(" train name : " + str(train_name)
+ "\n train number : " + str(train_number)
+ "\n from station : " + str(from_station)
+ "\n to station : " + str(to_station)
+ "\n boarding point : " + str(boarding_point)
+ "\n reservation upto : " + str(reservation_upto)
+ "\n pnr number : " + str(pnr_num)
+ "\n date of journey : " + str(date_of_journey)
+ "\n total no. of passengers: " + str(total_passengers)
+ "\n chart prepared : " + str(chart_prepared))
# looping through passenger list
for passenger in passengers_list:
# store the value or data # of "no" key in variable
passenger_num = passenger["no"]
# store the value or data of
# "current_status" key in variable current_status = passenger["current_status"]
# store the value or data of
# "booking_status" key in variable booking_status =
passenger["booking_status"]
# print following values
print(" passenger number : " + str(passenger_num)
+ "\n current status : " + str(current_status)
+ "\n booking_status : " + str(booking_status))
else:
```

```
print("Record Not Found")

NAME ")

tr=load(fin2) z=tr.gettrainno() n=tr.gettrainname() if (trainno==z):

print

print "TRAIN NAME IS : ",n

f=1 print

print "-"*80 no_ofac1st=tr.getno_ofac1stclass()
no_ofac2nd=tr.getno_ofac2ndclass() no_ofac3rd=tr.getno_ofac3rdclass()
no_ofsleeper=tr.getno_ofsleeper()

if(f==1): fout1=open("tickets.dat","ab") print

self.name=raw_input("ENTER THE PASSENGER'S

print

self.age=int(raw_input("PASSENGER'S AGE : ")) print

print"\t\t SELECT A CLASS YOU WOULD LIKE TO

TRAVEL IN :- "

print "1.AC FIRST CLASS"

print

print "2.AC SECOND CLASS"

print

print "3.AC THIRD CLASS"

print

print "4.SLEEPER CLASS"

print

c=int(raw_input("\t\t\tENTER YOUR CHOICE = ")) os.system('cls')

amt1=0 if(c==1):

self.no_oftickets=int(raw_input("ENTER NO_OF FIRST CLASS AC SEATS
TO BE BOOKED : "))

i=1 while(i<=self.no_oftickets):

self.totaf=self.totaf+1 amt1=1000*self.no_oftickets i=i+1
```

```
print
print "PROCESSING. .",
time.sleep(0.5) print ".", time.sleep(0.3) print'.' time.sleep(2) os.system('cls')
print "TOTAL AMOUNT TO BE PAID = ",amt1
self.resno=int(random.randint(1000,2546)) x=no_ofac1st-self.totaf
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dump(tick,fout1) break
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print "\t\t\t4. CANCELLATION OF TICKETS. "
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print "\t\t\t6. QUIT." print"** - office use      "
```

```
ch=int(raw_input("\t\t\tENTER YOUR CHOICE : ")) os.system('cls')

print "\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\t\t\t\t\t\tLOADI
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if ch==1:

j="*****" r=raw_input("\n\n\n\n\n\n\n\n\n\n\n\t\t\t\tENTER THE

PASSWORD: ")

os.system('cls') if (j==r):

x='y'

while (x.lower()=='y'): fout=open("tr1details.dat","ab") tr.getinput()

dump(tr,fout) fout.close()

print"\n\n\n\n\n\n\n\n\n\n\n\n\t\t\tUPDATING TRAIN LIST PLEASE WAIT . .",

time.sleep(1) print ("."),

time.sleep(0.5) print ("."), time.sleep(2) os.system('cls')

print "\n\n\n\n\n\n\n\n\n\n\n"

x=raw_input("\t\tDO YOU WANT TO ADD ANY MORE TRAINS DETAILS
? ")

os.system('cls') continue

elif(j<>r): print"\n\n\n\n\n"

print "WRONG PASSWORD".center(80) elif ch==2:

fin=open("tr1details.dat",'rb') if not fin:

print "ERROR" tick.display()

elif ch==6: quit()

raw_input("PRESS ENTER TO GO TO BACK

MENU".center(80))

os.system('cls')

menu()

sender_email = "my@gmail.com" receiver_email = "your@gmail.com"

password = input("Type your password and press enter:")
```

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message.attach(part2)

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with smtplib.SMTP_SSL("smtp.gmail.com", 465, context=context) as server:

server.login(sender_email, password) server.sendmail(

sender_email, receiver_email, message.as_string()

)

subject = "An email with attachment from Python"
```

```
body = "This is an email with attachment sent from Python" sender_email =
"my@gmail.com"

receiver_email = "your@gmail.com"

password = input("Type your password and press enter:")

# Create a multipart message and set headers message = MIMEMultipart()
message["From"] = sender_email message["To"] = receiver_email
message["Subject"] = subject

message["Bcc"] = receiver_email # Recommended for mass emails

# Add body to email message.attach(MIMEText(body, "plain"))

filename = "document.pdf" # In same directory as script # Open PDF file in
binary mode

with open(filename, "rb") as attachment:

# Add file as application/octet-stream

# Email client can usually download this automatically as attachment part =
MIMEBase("application", "octet-stream") part.set_payload(attachment.read())

# Encode file in ASCII characters to send by email
encoders.encode_base64(part)

# Add header as key/value pair to attachment part part.add_header(

"Content-Disposition", f"attachment; filename= {filename}",

)

# Add attachment to message and convert message to string
message.attach(part)

text = message.as_string()

# Log in to server using secure context and send email context =
ssl.create_default_context()

with smtplib.SMTP_SSL("smtp.gmail.com", 465, context=context) as server:

server.login(sender_email, password) server.sendmail(sender_email,
receiver_email, text)

api_key = "Your_API_key"

# base_url variable to store url

base_url = "https://api.railwayapi.com/v2/pnr-status/pnr/"
```

```
# Enter valid pnr_number pnr_number = "6515483790"
# Stores complete url address
complete_url = base_url + pnr_number + "/apikey/" + api_key + "/"
# get method of requests module # return response object
response_ob = requests.get(complete_url)
# json method of response object convert
# json format data into python format data result = response_ob.json()
# now result contains list # of nested dictionaries
if result["response_code"] == 200:
# train name is extracting
# from the result variable data train_name = result["train"]["name"]
# train number is extracting from # the result variable data
train_number = result["train"]["number"]
# from station name is extracting # from the result variable data
from_station = result["from_station"]["name"]
# to_station name is extracting from # the result variable data
to_station = result["to_station"]["name"]
# boarding point station name is
# extracting from the result variable data boarding_point =
result["boarding_point"]["name"]
# reservation upto station name is
# extracting from the result variable data reservation_upto =
result["reservation_upto"]["name"]
# store the value or data of "pnr" # key in pnr_num variable pnr_num =
result["pnr"]
# store the value or data of "doj" key # in variable date_of_journey variable
date_of_journey = result["doj"]
# store the value or data of
# "total_passengers" key in variable total_passengers =
result["total_passengers"]
```

```
# store the value or data of "passengers" # key in variable passengers_list
passengers_list = result["passengers"]

# store the value or data of

# "chart_prepared" key in variable chart_prepared = result["chart_prepared"]

# print following values

 print(" train name : " + str(train_name)

+ "\n train number : " + str(train_number)

+ "\n from station : " + str(from_station)

+ "\n to station : " + str(to_station)

+ "\n boarding point : " + str(boarding_point)

+ "\n reservation upto : " + str(reservation_upto)

+ "\n pnr number : " + str(pnr_num)

+ "\n date of journey : " + str(date_of_journey)

+ "\n total no. of passengers: " + str(total_passengers)

+ "\n chart prepared : " + str(chart_prepared))

# looping through passenger list

for passenger in passengers_list:

# store the value or data # of "no" key in variable

passenger_num = passenger["no"]

# store the value or data of

# "current_status" key in variable current_status = passenger["current_status"]

# store the value or data of

# "booking_status" key in variable booking_status =
passenger["booking_status"]

# print following values

print(" passenger number : " + str(passenger_num)

+ "\n current status : " + str(current_status)

+ "\n booking_status : " + str(booking_status))

else:
```

```
print("Record Not Found")
```

13.2.Git Hub & Project demo link:

Git Hub:

https://github.com/IBM-EPBL/IBM-Project-2892-1658485749

Project demo link:

https://youtu.be/CiSWp_a5PWY