SMART SOLUTIONS FOR RAILWAYS

A PROJECT REPORT

Submitted by

Team Id : PNT2022TMID37828
BATCH : B12-6A2E

1. PREM KUMAR R	**410619104027**
2. VISHAL S	**410619104046**
3. MOHAMED ISMAIL P M H	**410619104020**
4. SHEIK MOHAIDEEN R	**410619104036**
5. SAURAV SARDAR S	**410619104037**

In partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

In

COMPUTER SCIENCE AND ENGINEERING

DHAANISH AHMED COLLEGE OF ENGINEERING,
PADAPAI, CHENNAI – 601301

ANNA UNIVERSITY: CHENNAI 600 025

ANNA UNIVERSITY: CHENNAI 600 025

BONAFIDE CERTIFICATE

Certified that this project report “Real-Time Communication System Powered by AI for Specially Abled” is the bonafide work of **PREM KUMAR R (410619104027**), **VISHAL S (410619104046), MOHAMED ISMAIL P M H (410619104020), SHEIK MOHAIDEEN R (410619104036), SAURAV SARDAR S (410619104037),** who carried out the project work under my supervision.

SIGNATURE
Mr. P. VELAVAN., M.E.,(PhD).,
HEAD OF THE DEPARTMENT
Computer Science Engineering
Dhaanish Ahmed College of Engineering
Padappai
Chennai – 601 301

SIGNATURE
Mr. RAJASEKAR M.E,(Ph.D).,
PROJECT GUIDE
Assistant Professor
Electronics and communications Engineering
Dhaanish Ahmed College of Engineering
Padappai
Chennai - 601301

Project Viva-Voce held on ________

INTERNAL EXAMINER **EXTERNAL EXAMINER**

ACKNOWLEDGEMENT

First and foremost, we thank the Almighty for helping us in all situations for bringing out this project successfully.

We express our sincere heartfelt gratitude to **ALHAJ K. MOOSA,** Founder and Chairman, and **Mr. M. KADAR SHAH, B.A., M.B.A.,** Secretary, Dhaanish Ahmed College of Engineering, Chennai.

We record our immense pleasure in expressing sincere gratitude to our Principal **Dr. Uma Gowri.G** and our Director **Dr.Paramasivan, Ph.d, Dhaanish Ahmed College of Engineering,** for granting permission to undertake the project in our college.

We express our sincere thanks to our Head of the Department **Mr.C.Elayaraja, M.E.,(Ph.D).,Dhaanish Ahmed College of Engineering,** and our project guide **Mr. Rajasekhar, M.E., Assistant professor, Dhaanish Ahmed College of Engineering,** for their constant encouragement and direction for this project.

We wish to express our thanks to all the **Faculty Member and Non-teachings staff** of the Department of Electronics and Communications Engineering for their valuable support.

We also thank our Parents and Friends for their support throughout the project.

TABLE OF CONTENTS:

S.NO	**TITLE**
1	**INTRODUCTION**
1.1	Project Overview
1.2	Purpose
2	**LITERATURE SURVEY**
2.1	Existing problem
2.2	References
2.3	Problem Statement Definition
3	**IDEATION & PROPOSED SOLUTION**
3.1	Empathy Map Canvas
3.2	Ideation & Brainstorming
3.3	Proposed Solution
3.4	Problem Solution Fit
4	**REQUIREMENT ANALYSIS**
4.1	Functional requirements
4.2	Non-Functional requirements
5	**PROJECT DESIGN**

5.1	Data Flow Diagrams
5.2	Solution &Technical Architecture
6	**PROJECT PLANNING & SCHEDULING**
6.1	Sprint Planning & Estimation
6.2	Sprint Delivery Schedule
6.3	Milestone And Activity List
7	**CODING & SOLUTIONING**
7.1	Feature 1
7.2	Feature 2
8	**TESTING**
9	**ADVANTAGES & DISADVANTAGES**
10	**FUTURE SCOPE**
11	**CONCLUSION**

1. INTRODUCTION

1.1 Project Overview

- A Web page is designed for the public where they can book tickets by seeing the available seats.
- After booking the train, the person will get a QR code which has to be shown to the Ticket Collector while boarding the train.
- The ticket collectors can scan the QR code to identify the personal details.
- A GPS module is present in the train to track it. The live status of the journey is updated in the Web app continuously
- All the booking details of the customers will be stored in the database with a unique ID and they can be retrieved back whenthe Ticket Collector scans the QR Code.

1.2 Purpose

The Purpose of our Project is

- ✓ To reduce the work load of the user and also the use of paper.
- ✓ To enable online Ticket Booking
- ✓ To track the live location of train
- ✓ To enable Automatic Ticket Verification system
- ✓ To reduce the work load of Travelling Ticket Examiner (TTE)

2. LITERATURE SURVEY

2.1 Existing Problem :

➤ Passengers who need to book train tickets have to follow a tedious procedure to get a ticket reserved.

➤ They have to wait in the Ticket booking counter to do the reservation.

➤ Also the TTE has a heavy workload in processing all the paper documents in verifying a user's ticket.

➤ Public users wish to track their train journey to have a sophisticated travel.

2.2 References :

☆ https://www.ibm.com/blogs/internet-of-things/connected-trains-rail-travel/

☆ https://indianrailways.gov.in/railwayboard/uploads/directorate/secretary_branches/IR_Reforms/Innovation%20in%20Indian%20Railways%20.pdf

☆ Indian Railways Vision 2020 (Para 6.1 Reinventing Passenger Services with Change for a better tomorrow as the motto, Page8-9)

☆ Travel, Transportation & Hospitality page on www.tcs.com

☆ https://international-railway-saftey-council.com/about-us

☆ http://sts.hitachirsil.com/en/products-services/glossary

2.3 Problem Statement Definition :

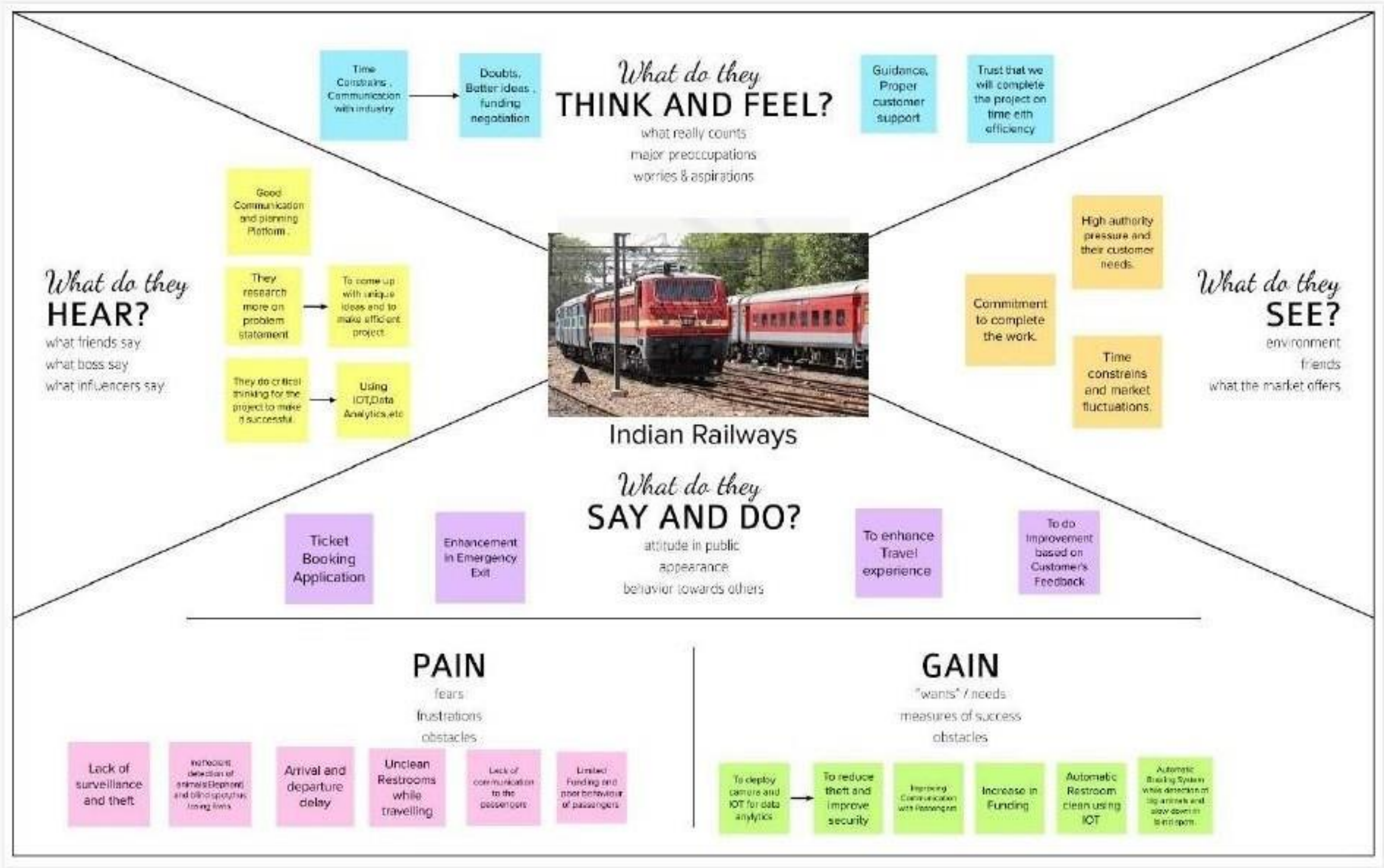
➢ Railway Passengers need a way to book their tickets easily without delay and tedious process so that the passengers getbenefits by saving their time and energy in travelling.

➢ Ticket checkers are in need of a Digital verification system of passenger’s tickets to avoid huge use of pen and paper.

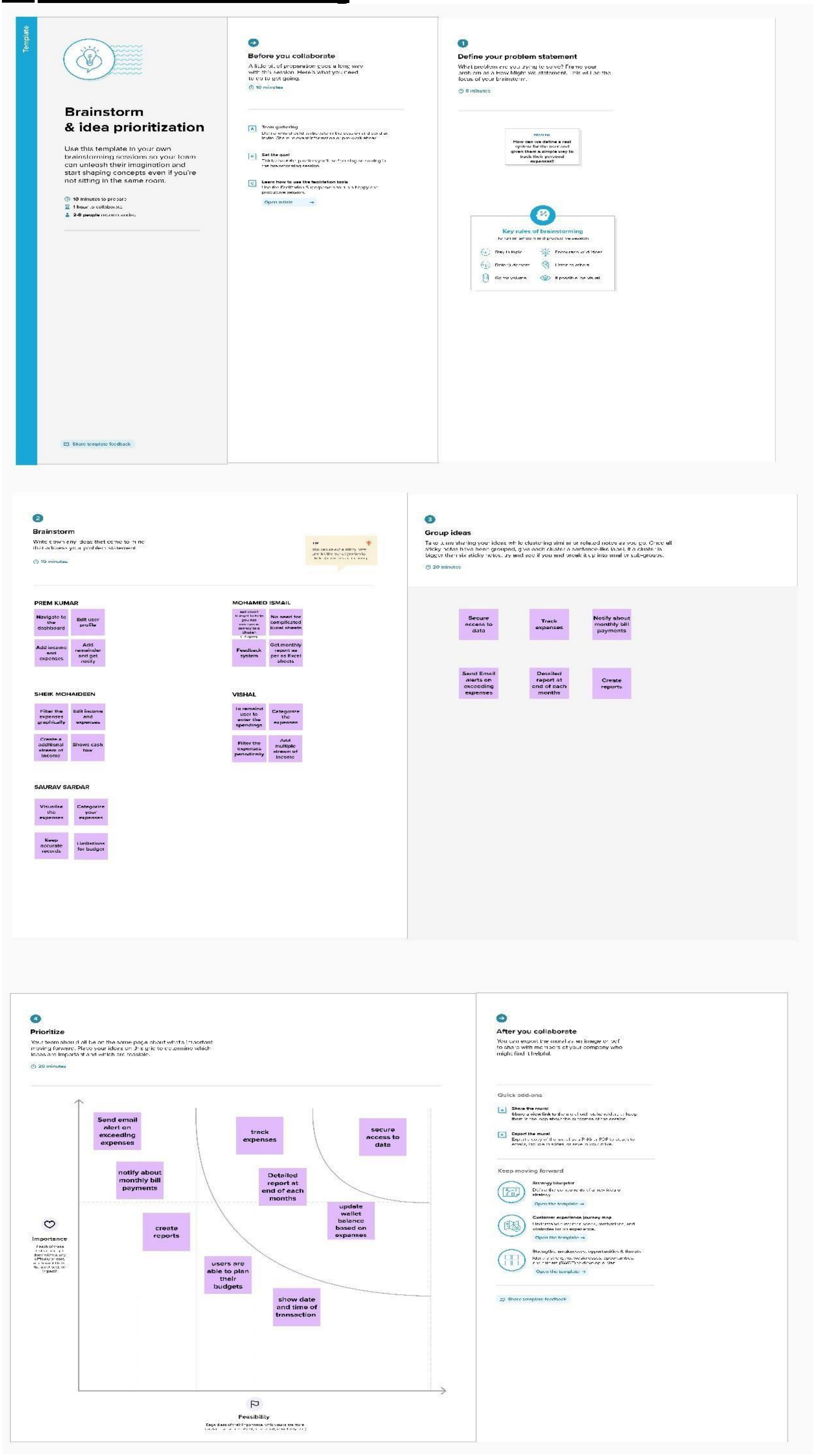
➢ Passengers need a platform to track the current location and status of trains in order to avoid anxiety of fear of missing thetrain.

3. IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas


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 eith 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
Indian Railways
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
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
Inefficient detection of animals(Elephant) and blind spots thus losing lives
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 camera and IOT for data anylytics
To reduce theft and improve security
Improving Communication with Passengers
Increase in Funding
Automatic Restroom clean using IOT
Automatic Braking System while detection of big animals and slow down in blind spots.

3.2 Ideation & 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

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

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

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

Open article →

1

Define your problem statement

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

5 minutes

PROBLEM
How can we define a rest system for the user and given 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
You can select a sticky note and hit the pencil [switch to sketch] icon to start drawing!

PREM KUMAR
Navigate to the dashboard
Edit user profile
Add income and expenses
Add remainder and get notify

MOHAMED ISMAIL
Set short budget to help you not overspend money in a chosen category
No need for complicated Excel sheets
Feedback system
Get monthly report as per as Excel sheets

SHEIK MOHAIDEEN
Filter the expenses graphically
Edit income and expenses
Create a additional stream of income
Shows cash flow

VISHAL
To remaind user to enter the spendings
Categorize the expenses
Filter the expenses periodically
Add multiple stream of income

SAURAV SARDAR
Visualize the expenses
Categorize your expenses
Keep accurate records
Limitations for budget

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
Track expenses
Notify about monthly bill payments
Send Email alerts on exceeding expenses
Detailed report at end of each months
Create reports

4

Prioritize

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

20 minutes

Send email alert on exceeding expenses
track expenses
secure access to date
notify about monthly bill payments
Detailed report at end of each months
update wallet balance based on expenses
create reports
users are able to plan their budgets
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.)

After you collaborate

You can export the mural as an image or pdf to share with members of your company who might find it helpful.

Quick add-ons

A Share the mural
Share a view link to the mural with stakeholders to keep them in the loop about the outcomes of the session.

B Export the mural
Export a copy of the mural as a PNG or PDF to attach to emails, include in slides, or save in your drive.

Keep moving forward

Strategy blueprint
Define the components of a new idea or strategy.
Open the template →

Customer experience journey map
Understand customer needs, motivations, and obstacles for an experience.
Open the template →

Strengths, weaknesses, opportunities & threats
Identify strengths, weaknesses, opportunities, and threats (SWOT) to develop a plan.
Open the template →

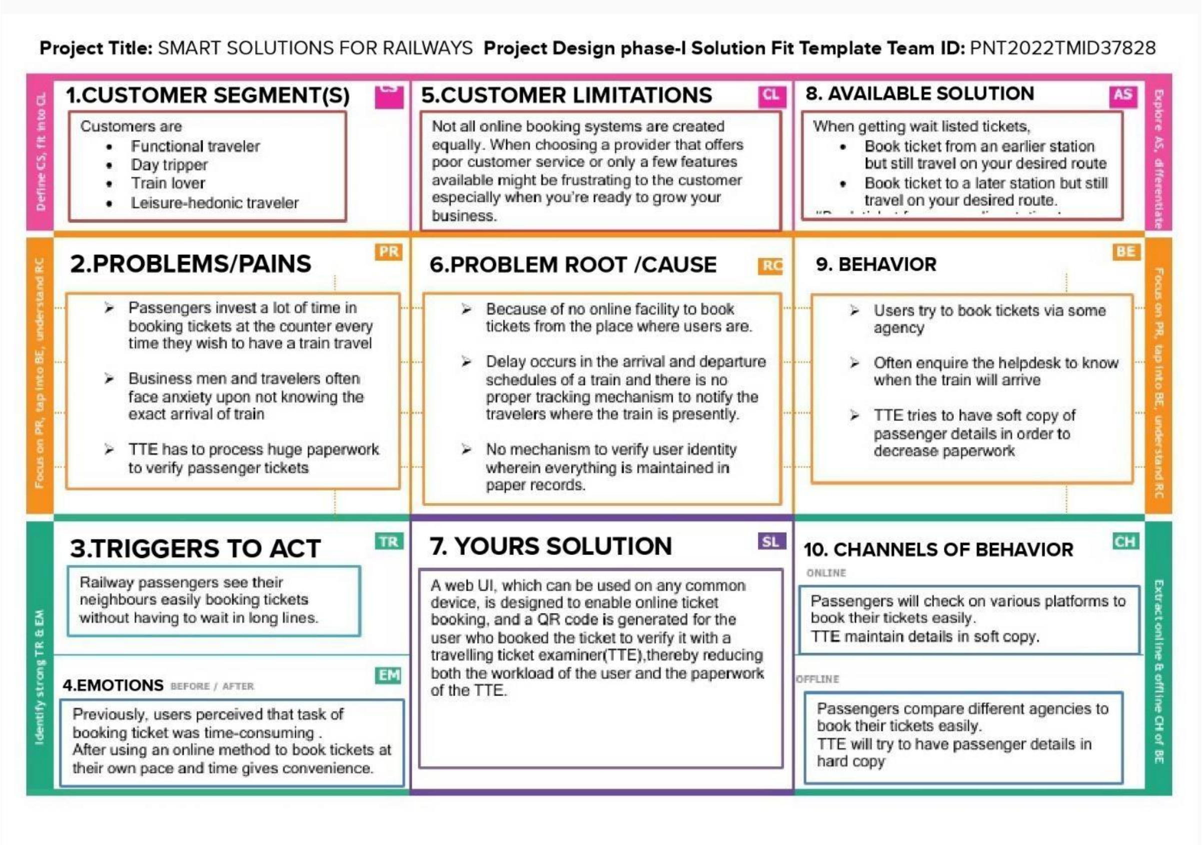
Share template feedback

3.3 Proposed Solution

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	How might we reduce the workload of the user and the use of paper while booking tickets? How to ease the work of verifying the Tickets which is usually done by TTE thereby reducing the paperwork?
2.	Novelty / Uniqueness	● User friendly interface (Web Page) to book the ticket. ● Unique QR code for each user to verify their tickets. ● GPS Module to track the location of Train andlive status is updated in the Web app
3.	Idea / Solution description	A Web UI is designed to enable online ticket booking anda QR code is generated for the user who has bookedthe ticket to verify it with Travelling Ticket Examiner (TTE) which is done using Cloud Service.
4.	Social Impact / Customer Satisfaction	❖ This model reduces the time consuming ticket booking by automating the process. ❖ TTE can easily verify the details of the passenger using the QR code generated while booking the ticket which may reduce the use of paper work.

		❖ The location of the train is updated periodically in the web app so customers can easily track the status of the train which may help the customer to arrive on time.
5.	Business Model (Revenue Model)	➔ This solution gives a feasibility to reduce the conventional ticket booking mechanism at counters which is tedious and time consuming, also the verification of the tickets is simplified. Since it also gives an additional train tracking method it will be more welcomed by the users. ➔ This model helps businessmen and travellers to book the tickets easily and it provides flexibility so customers will prefer this model which may increase the revenue of this model. ➔ Selling a Product which enables online booking platform and automatic verification system would fetch more revenues to the Organisation, also the Online Platform has to be maintained continuously and so, the business will sustain and can be improved if required.
6.	Scalability of the Solution	★ We propose a solution which works on the SaaS(Software as a Service) cloud model wherein all necessities are deployed in the web browser which gives an easy access and also the cost is minimal which gives a scaled solution approach. ★ The cloud is deployed as a public cloud model which gives a feasible access to upload passenger details and to retrieve data . ★ Further a QR code is generated to hold the unique data of user in cloud,and a GPS module is attached to Iot platform inorder to monitor the train location which gives an additional tracking mechanism to ensure reliability.

3.4Problem Solution Fit



Project Title: SMART SOLUTIONS FOR RAILWAYS **Project Design phase-I Solution Fit Template Team ID:** PNT2022TMID37828

Define CS, fit into CL

1.CUSTOMER SEGMENT(S) CS

Customers are

- Functional traveler
- Day tripper
- Train lover
- Leisure-hedonic traveler

5.CUSTOMER LIMITATIONS CL

Not all online booking systems are created equally. When choosing a provider that offers poor customer service or only a few features available might be frustrating to the customer especially when you're ready to grow your business.

8. AVAILABLE SOLUTION AS

When getting wait listed tickets,

- Book ticket from an earlier station but still travel on your desired route
- Book ticket to a later station but still travel on your desired route.

Explore AS, differentiate

Focus on PR, tap into BE, understand RC

2.PROBLEMS/PAINS PR

- ➢ Passengers invest a lot of time in booking tickets at the counter every time they wish to have a train travel
- ➢ Business men and travelers often face anxiety upon not knowing the exact arrival of train
- ➢ TTE has to process huge paperwork to verify passenger tickets

6.PROBLEM ROOT /CAUSE RC

- ➢ Because of no online facility to book tickets from the place where users are.
- ➢ Delay occurs in the arrival and departure schedules of a train and there is no proper tracking mechanism to notify the travelers where the train is presently.
- ➢ No mechanism to verify user identity wherein everything is maintained in paper records.

9. BEHAVIOR BE

- ➢ Users try to book tickets via some agency
- ➢ Often enquire the helpdesk to know when the train will arrive
- ➢ TTE tries to have soft copy of passenger details in order to decrease paperwork

Focus on PR, tap into BE, understand RC

Identify strong TR & EM

3.TRIGGERS TO ACT TR

Railway passengers see their neighbours easily booking tickets without having to wait in long lines.

4.EMOTIONS BEFORE / AFTER EM

Previously, users perceived that task of booking ticket was time-consuming .
After using an online method to book tickets at their own pace and time gives convenience.

7. YOURS SOLUTION SL

A web UI, which can be used on any common device, is designed to enable online ticket booking, and a QR code is generated for the user who booked the ticket to verify it with a travelling ticket examiner(TTE),thereby reducing both the workload of the user and the paperwork of the TTE.

10. CHANNELS OF BEHAVIOR CH

ONLINE

Passengers will check on various platforms to book their tickets easily.
TTE maintain details in soft copy.

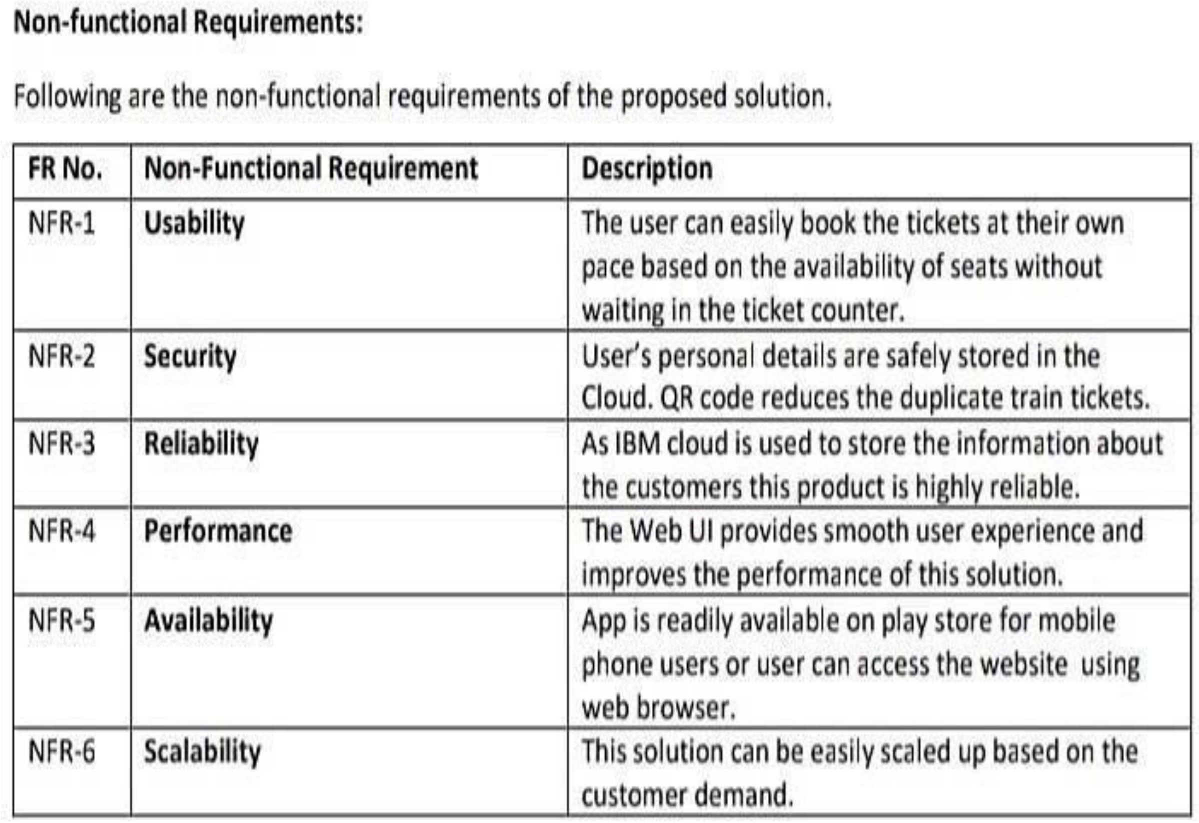
OFFLINE

Passengers compare different agencies to book their tickets easily.
TTE will try to have passenger details in hard copy

Extract online & offline CH of BE

4. REQUIREMENT ANALYSIS

4.1 Functional Requirement

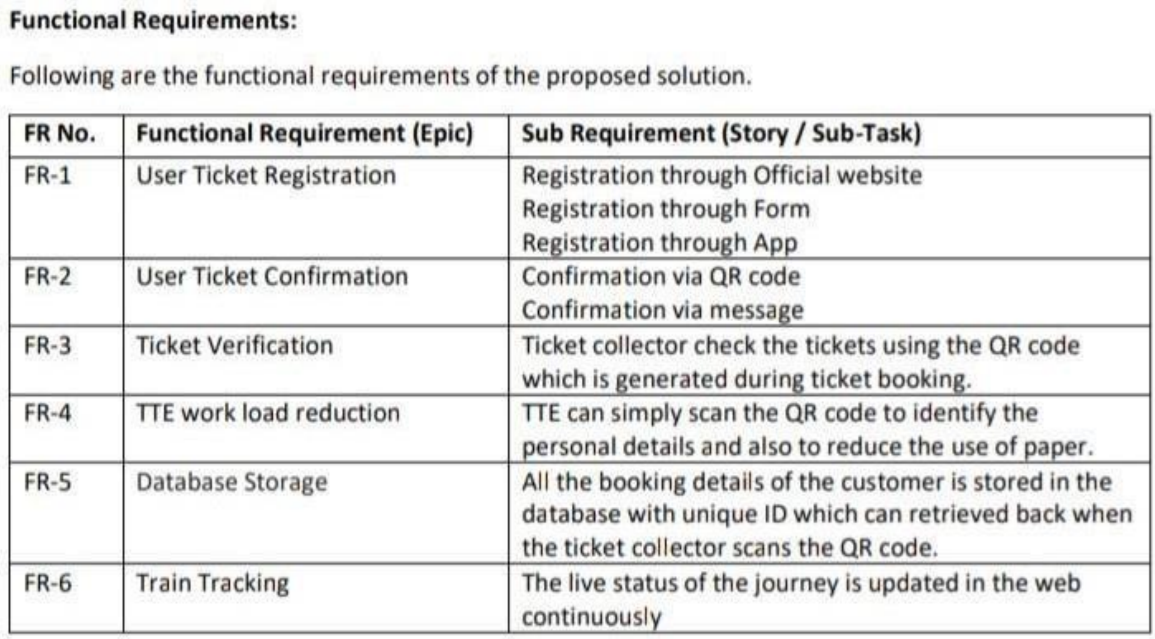


Non-functional Requirements:

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

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	The user can easily book the tickets at their own pace based on the availability of seats without waiting in the ticket counter.
NFR-2	**Security**	User's personal details are safely stored in the Cloud. QR code reduces the duplicate train tickets.
NFR-3	**Reliability**	As IBM cloud is used to store the information about the customers this product is highly reliable.
NFR-4	**Performance**	The Web UI provides smooth user experience and improves the performance of this solution.
NFR-5	**Availability**	App is readily available on play store for mobile phone users or user can access the website using web browser.
NFR-6	**Scalability**	This solution can be easily scaled up based on the customer demand.

4.2 Non-Functional Requirement



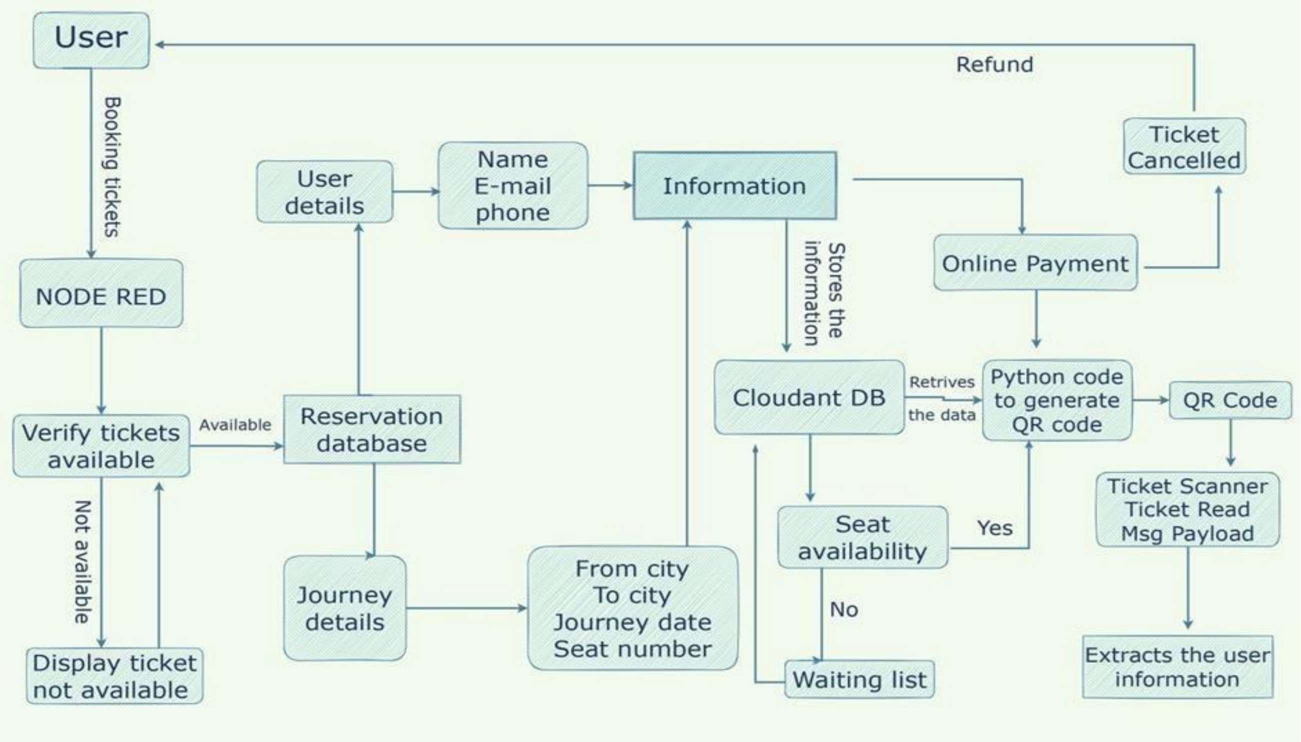
Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Ticket Registration	Registration through Official website Registration through Form Registration through App
FR-2	User Ticket Confirmation	Confirmation via QR code Confirmation via message
FR-3	Ticket Verification	Ticket collector check the tickets using the QR code which is generated during ticket booking.
FR-4	TTE work load reduction	TTE can simply scan the QR code to identify the personal details and also to reduce the use of paper.
FR-5	Database Storage	All the booking details of the customer is stored in the database with unique ID which can retrieved back when the ticket collector scans the QR code.
FR-6	Train Tracking	The live status of the journey is updated in the web continuously

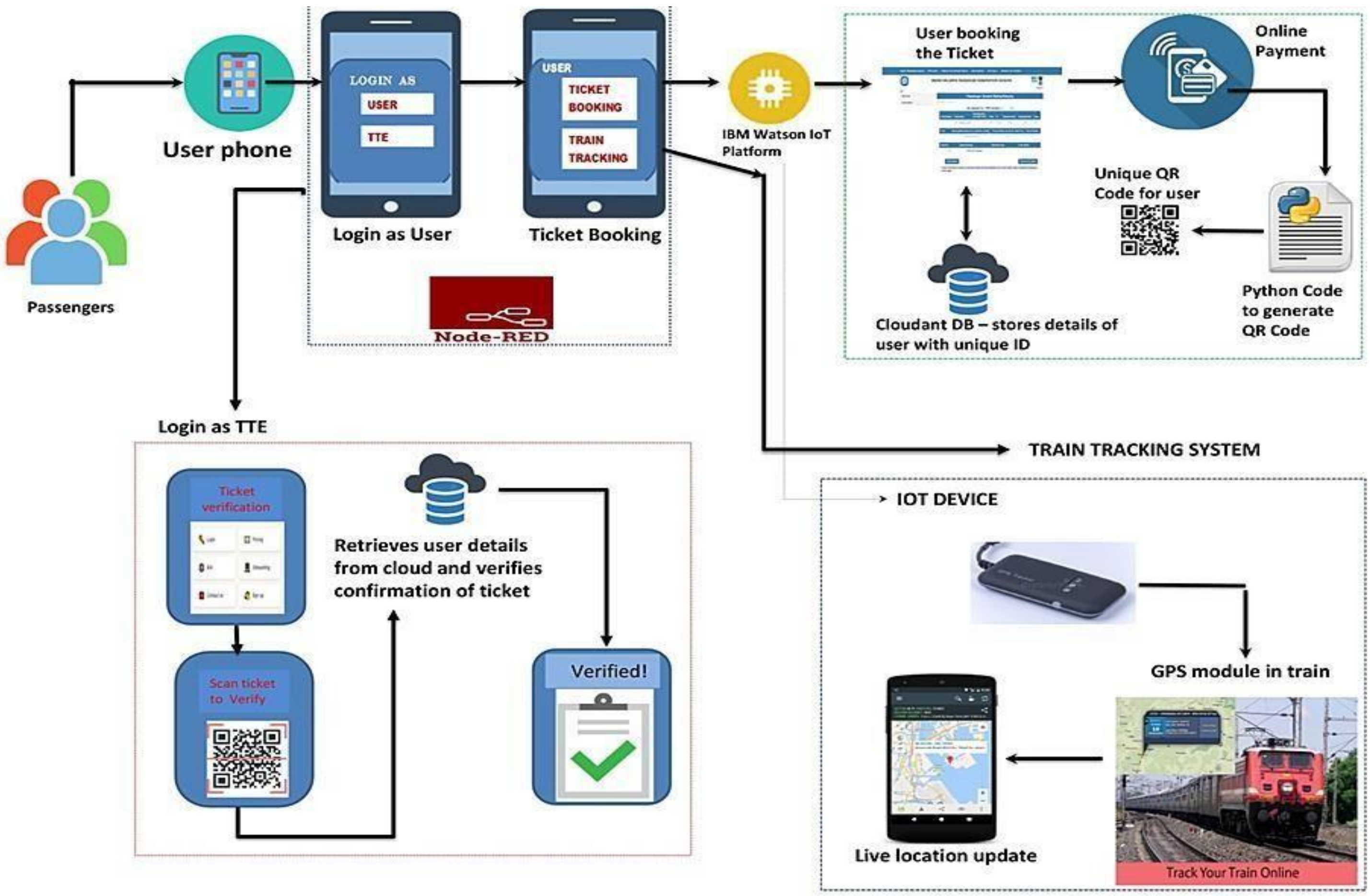
5. PROJECT DESIGN

5.1 Data Flow Diagram

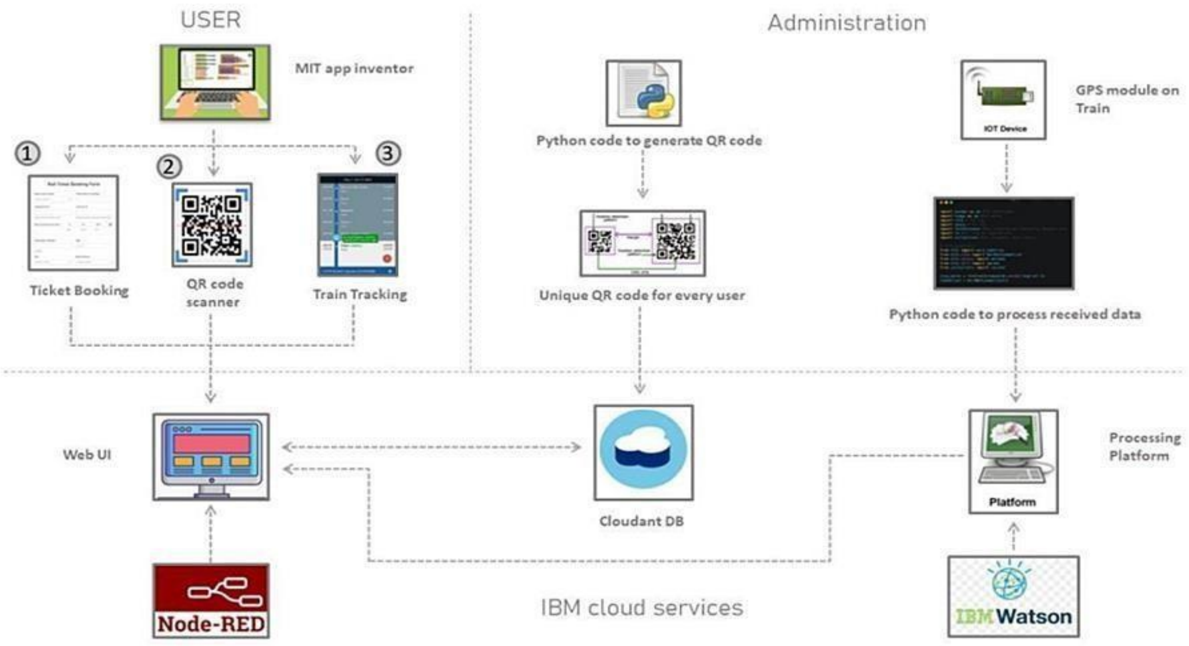


5.2 Solution And Technical Architecture

Solution architecture



Technical Architecture



6. PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation

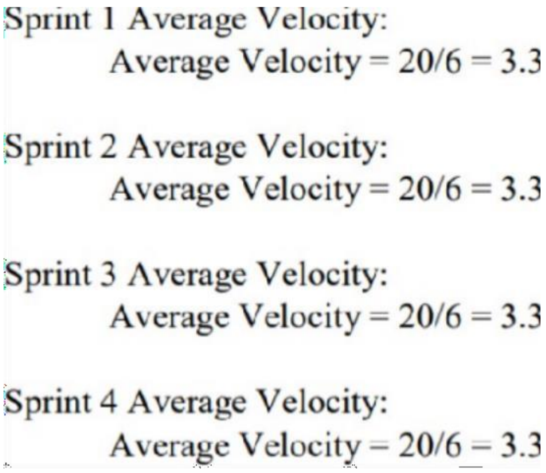
Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
SPRINT-1						
Sprint-1	IBM Cloud Service	USN-1	Create the IBM Cloud services which arebeing used in this project.	2	Medium	PREM KUMAR R MOHAMED ISMAIL P M H VISHAL S SHEIK MOHAIDEEN R SOURAV SARDAR
Sprint-1	Software	USN-2	Installation of python IDLE along with thelibraries such as wiotp-sdk, ibmcloudant, opencv-python and pyzbar	6	High	PREM KUMAR R MOHAMED ISMAIL P M H SHEIK MOHAIDEEN R
Sprint-1	Create IBM WatsonIOT platform	USN-3	IBM Watson IOT platform acts as the mediator To connect the web application toIOT devices, So create the IBM Watson platform.	6	High	PREM KUMAR R VISHAL S SOURAV SARDAR
Sprint-1	Creating Device in IBM Watson IOT platform	USN-4	In order to connect the IOT device to the IBMcloud, create a device in the IBM Watson IOT Platform and get the device crendentials..	6	High	PREM KUMAR RVISHAL S

SPRINT-2						
Sprint-2	API keys for NodeRED Service	USN-1	Configure the connection security and create API keys that are used in the Node-RED Services for accessing the IBM IOTPlatform..	6	High	PREM KUMAR R MOHAMED ISMAIL P M H VISHAL S SOURAV SARDAR
Sprint-2	Node RED App	USN-2	Create a Node-RED service.	6	High	PREM KUMAR R VISHAL S SHEIK MOHAIDEEN RSOURAV SARDAR
SPRINT-3						
Sprint-3	Python Code	USN-1	Develop a Python Script for publishing the Location (latitude and longitude) data to theIBM IOT Platform and the other python code To read the QR Code and fetch the data from Cloudant DB.	6	High	PREM KUMAR R VISHAL S SHEIK MOHAIDEEN R
SPRINT-4						
Sprint-4	Web Application	USN-1	Develop the web application using Node-RED	6	High	PREM KUMAR R MOHAMED ISMAIL P M H VISHAL S SHEIK MOHAIDEEN R
Sprint-4	Testing	USN-2	Testing the Web UI by giving the requiredinputs	6	High	PREM KUMAR R MOHAMED ISMAIL P M H VISHAL S SOURAV SARDAR

6.2 Sprint Delivery Schedule:

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on 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	05 Nov 2022
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 Nov 2022

Velocity :



Sprint 1 Average Velocity:

Average Velocity = 20/6 = 3.3

Sprint 2 Average Velocity:

Average Velocity = 20/6 = 3.3

Sprint 3 Average Velocity:

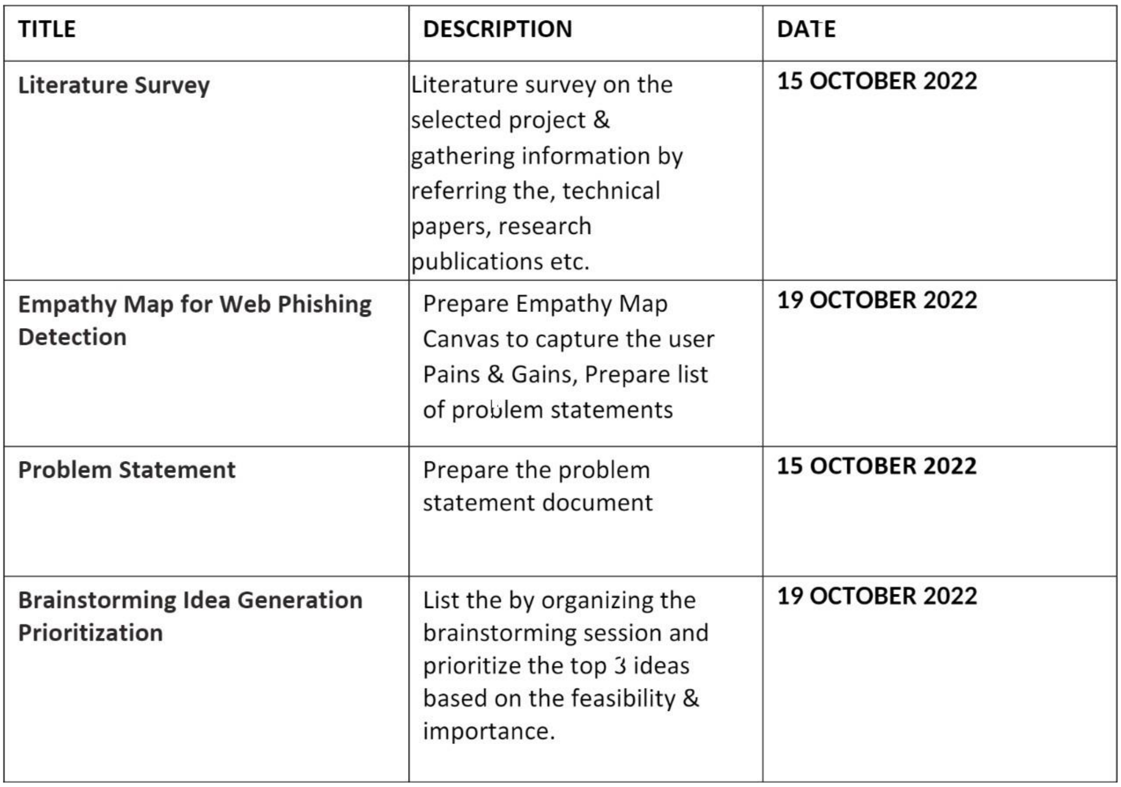
Average Velocity = 20/6 = 3.3

Sprint 4 Average Velocity:

Average Velocity = 20/6 = 3.3

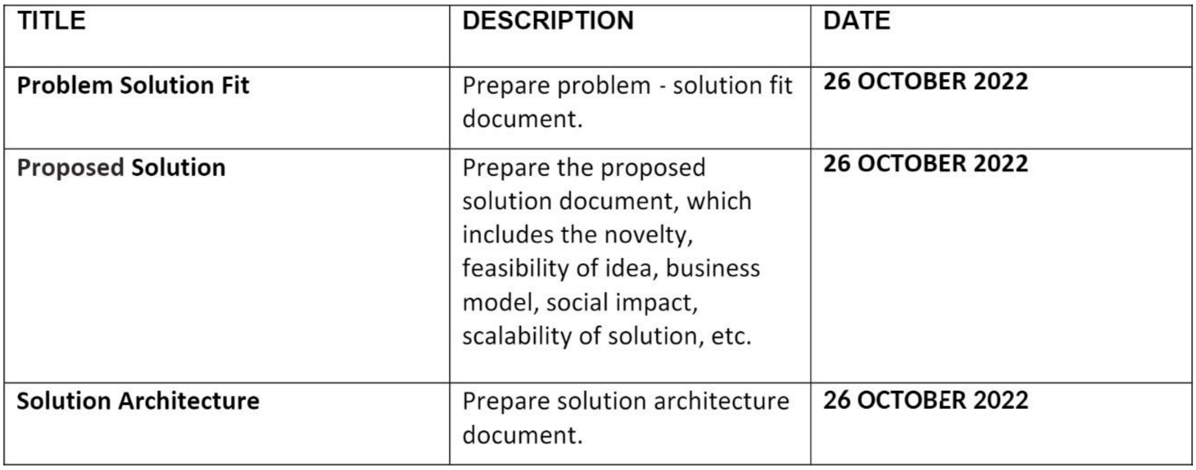
6.3 MILESTONE AND ACTIVITY LIST

IDEATION PHASE



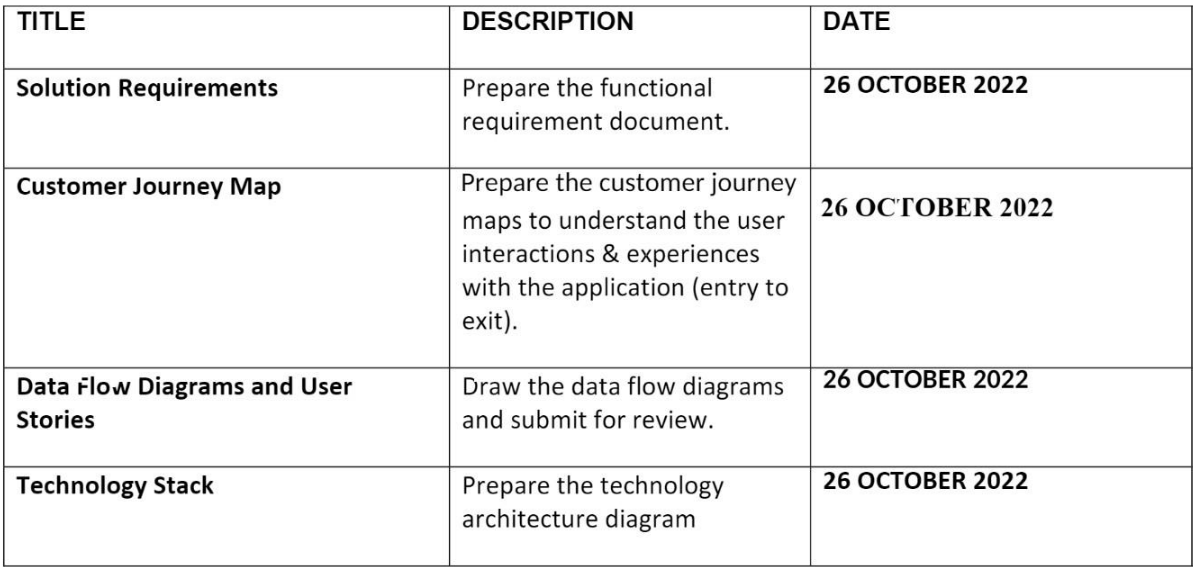
TITLE	DESCRIPTION	DATE
Literature Survey	Literature survey on the selected project & gathering information by referring the, technical papers, research publications etc.	**15 OCTOBER 2022**
Empathy Map for Web Phishing Detection	Prepare Empathy Map Canvas to capture the user Pains & Gains, Prepare list of problem statements	**19 OCTOBER 2022**
Problem Statement	Prepare the problem statement document	**15 OCTOBER 2022**
Brainstorming Idea Generation Prioritization	List the by organizing the brainstorming session and prioritize the top 3 ideas based on the feasibility & importance.	**19 OCTOBER 2022**

PROJECT DESIGN PHASE 1



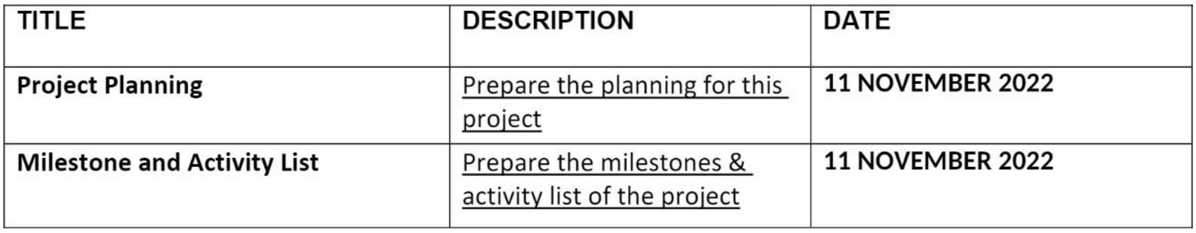
TITLE	DESCRIPTION	DATE
Problem Solution Fit	Prepare problem - solution fit document.	**26 OCTOBER 2022**
Proposed Solution	Prepare the proposed solution document, which includes the novelty, feasibility of idea, business model, social impact, scalability of solution, etc.	**26 OCTOBER 2022**
Solution Architecture	Prepare solution architecture document.	**26 OCTOBER 2022**

PROJECT DESIGN PHASE 2



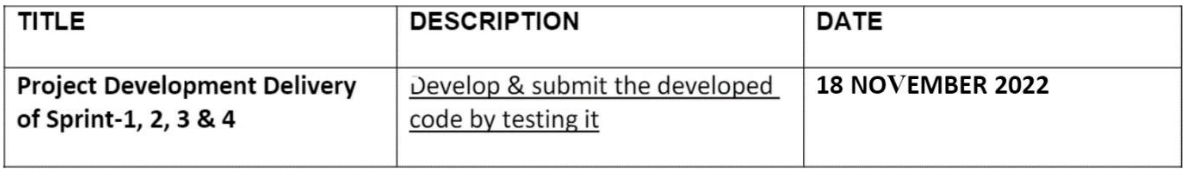
TITLE	DESCRIPTION	DATE
Solution Requirements	Prepare the functional requirement document.	**26 OCTOBER 2022**
Customer Journey Map	Prepare the customer journey maps to understand the user interactions & experiences with the application (entry to exit).	**26 OCTOBER 2022**
Data Flow Diagrams and User Stories	Draw the data flow diagrams and submit for review.	**26 OCTOBER 2022**
Technology Stack	Prepare the technology architecture diagram	**26 OCTOBER 2022**

PROJECT PLANNING PHASE



TITLE	DESCRIPTION	DATE
Project Planning	Prepare the planning for this project	**11 NOVEMBER 2022**
Milestone and Activity List	Prepare the milestones & activity list of the project	**11 NOVEMBER 2022**

PROJECT DEVELOPMENT



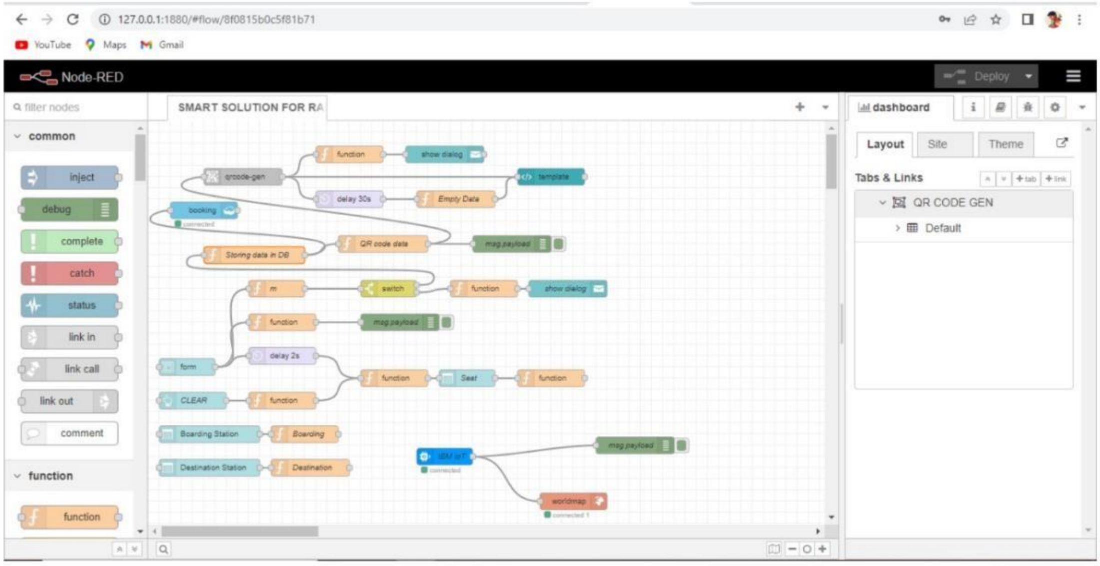
TITLE	DESCRIPTION	DATE
Project Development Delivery of Sprint-1, 2, 3 & 4	Develop & submit the developed code by testing it	**18 NOVEMBER 2022**

7. CODING & SOLUTIONING

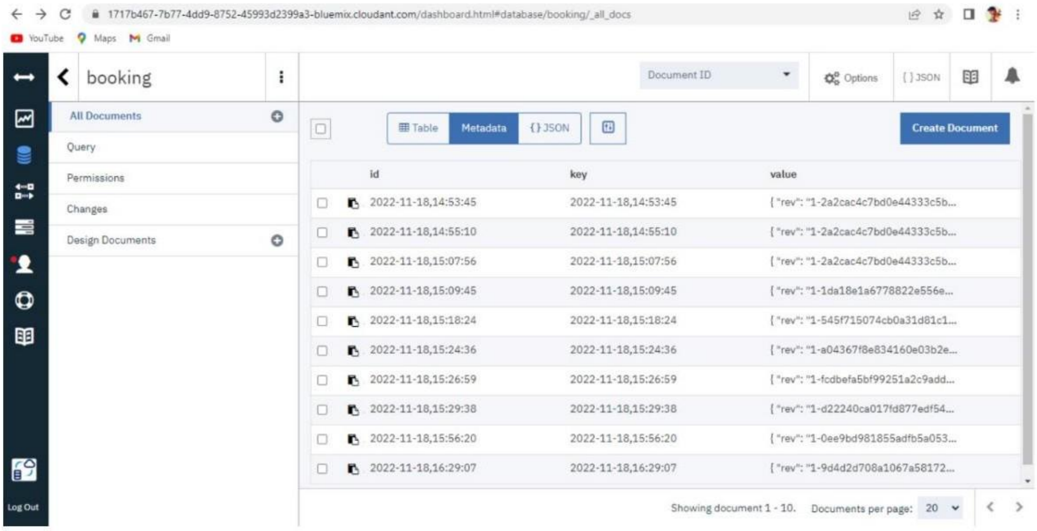
7.1 FEATURE 1

TRAIN TICKET BOOKING

1. Creating Web UI using NodeRed



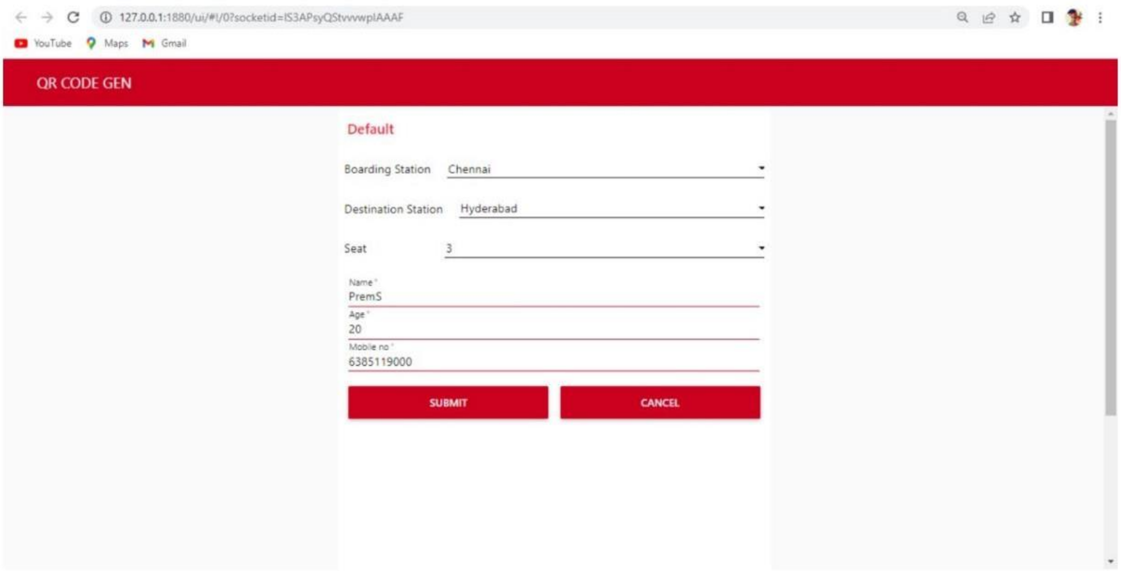
2 .Details triggered to cloudant database



id	key	value
2022-11-18,14:53:45	2022-11-18,14:53:45	{ "rev": "1-2a2cac4c7bd0e44333c5b...
2022-11-18,14:55:10	2022-11-18,14:55:10	{ "rev": "1-2a2cac4c7bd0e44333c5b...
2022-11-18,15:07:56	2022-11-18,15:07:56	{ "rev": "1-2a2cac4c7bd0e44333c5b...
2022-11-18,15:09:45	2022-11-18,15:09:45	{ "rev": "1-1da18e1a6778822e556e...
2022-11-18,15:18:24	2022-11-18,15:18:24	{ "rev": "1-545f715074cb0a31d81c1...
2022-11-18,15:24:36	2022-11-18,15:24:36	{ "rev": "1-a04367f8e834160e03b2e...
2022-11-18,15:26:59	2022-11-18,15:26:59	{ "rev": "1-fcdbefa5bf99251a2c9add...
2022-11-18,15:29:38	2022-11-18,15:29:38	{ "rev": "1-d22240ca017fd877edf54...
2022-11-18,15:56:20	2022-11-18,15:56:20	{ "rev": "1-0ee9bd981855adfb5a053...
2022-11-18,16:29:07	2022-11-18,16:29:07	{ "rev": "1-9d4d2d708a1067a58172...

Showing document 1 - 10. Documents per page: 20

WEB UI INTERFACE



Default

Boarding Station Chennai

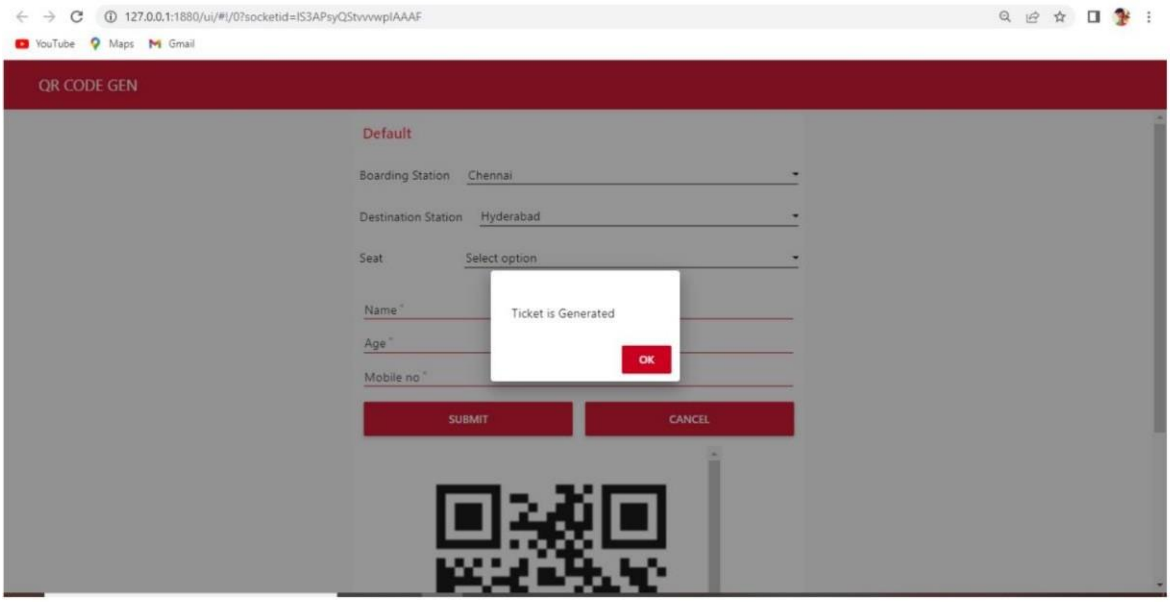
Destination Station Hyderabad

Seat 3

Name * PremS

Age * 20

Mobile no * 6385119000



Default

Boarding Station Chennai

Destination Station Hyderabad

Seat Select option

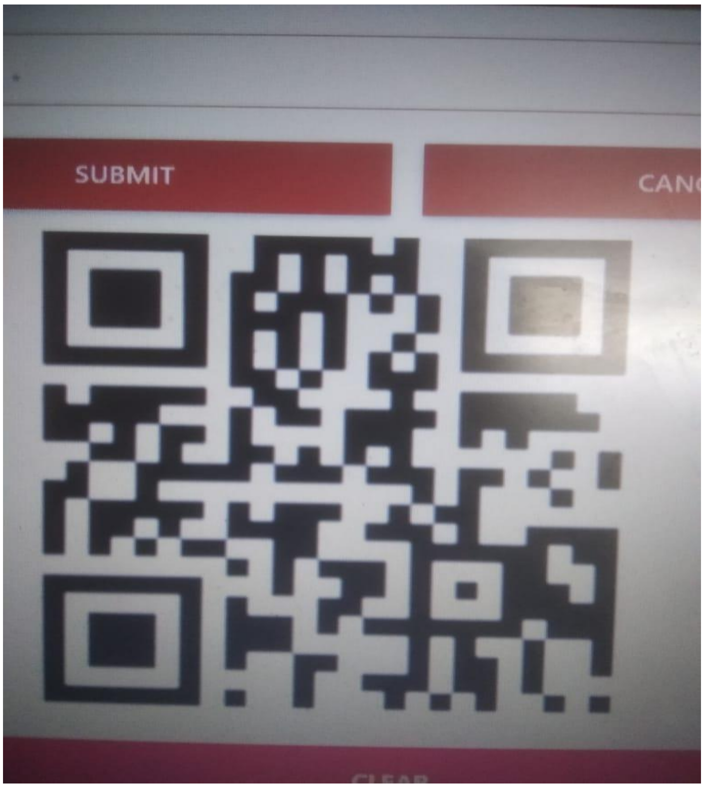
Name *

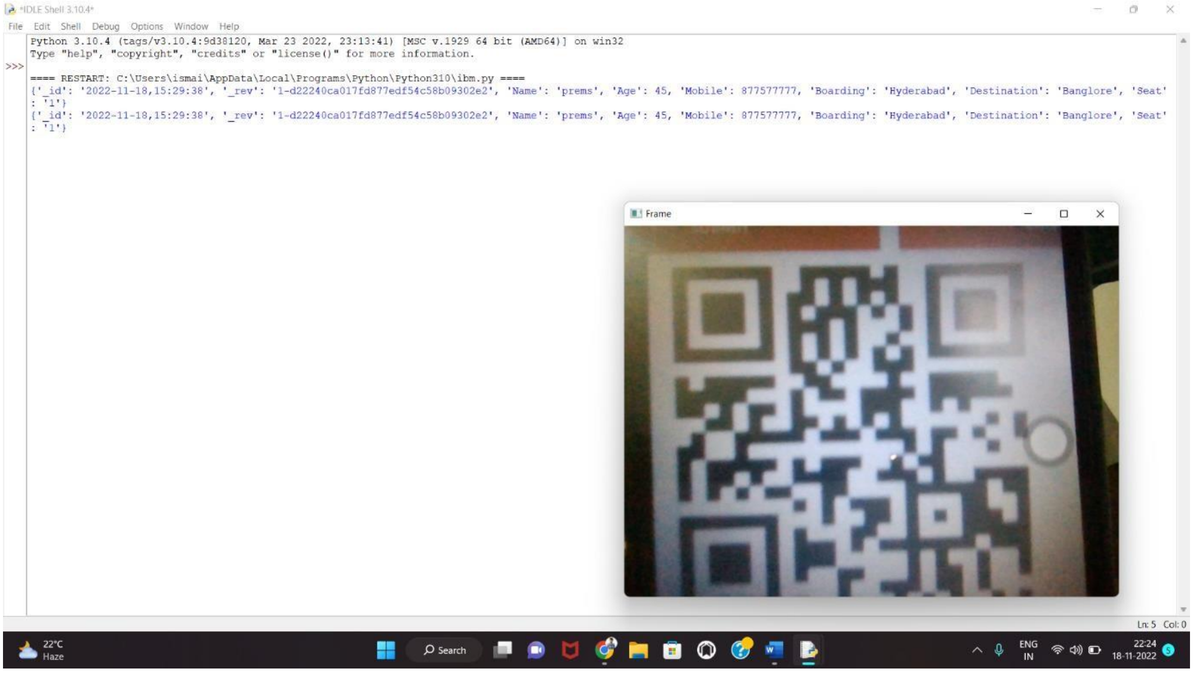
Age *

Mobile no *

Ticket is Generated

QR CODE SCANNER





```
Python 3.10.4 (tags/v3.10.4:9d38120, Mar 23 2022, 23:13:41) [MSC v.1929 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
==== RESTART: C:\Users\ismai\AppData\Local\Programs\Python\Python310\ibm.py ====
{'_id': '2022-11-18,15:29:38', '_rev': '1-d22240ca017fd877edf54c58b09302e2', 'Name': 'prems', 'Age': 45, 'Mobile': 877577777, 'Boarding': 'Hyderabad', 'Destination': 'Banglore', 'Seat'
: '1'}
{'_id': '2022-11-18,15:29:38', '_rev': '1-d22240ca017fd877edf54c58b09302e2', 'Name': 'prems', 'Age': 45, 'Mobile': 877577777, 'Boarding': 'Hyderabad', 'Destination': 'Banglore', 'Seat'
: '1'}
```

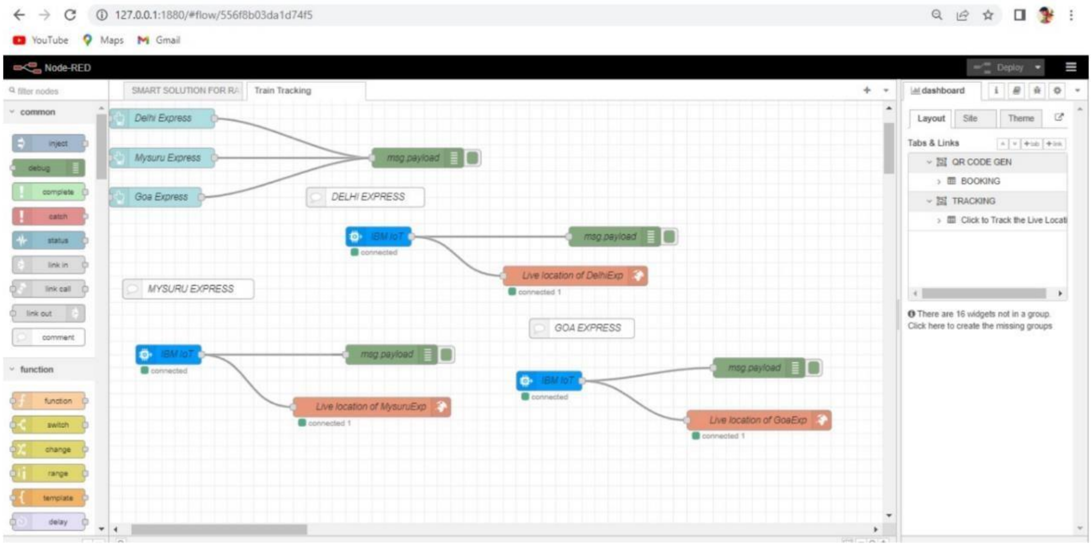
PYTHON CODE FOR SCANNER

```
import cv2
import numpy as np
import time
import pyzbar.pyzbar as pyzbar
from ibmcloudant.cloudant_v1 import CloudantV1
from ibmcloudant import CouchDbSessionAuthenticator
from ibm_cloud_sdk_core.authenticators import BasicAuthenticator

authenticator = BasicAuthenticator('apikey-v2-
30hnmyd6h3fiaj69li9ggw9blvoscijj6mf87ria6u36',
'bb766c5fb0c091d29b60a401aa387f73')
service = CloudantV1(authenticator=authenticator)
service.set_service_url('https://apikey-v2-
30hnmyd6h3fiaj69li9ggw9blvoscijj6mf87ria6u36:bb766c5fb0c091d29b60a401
aa387f73@1717b467-7b77-4dd9-8752-45993d2399a3-
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()
```

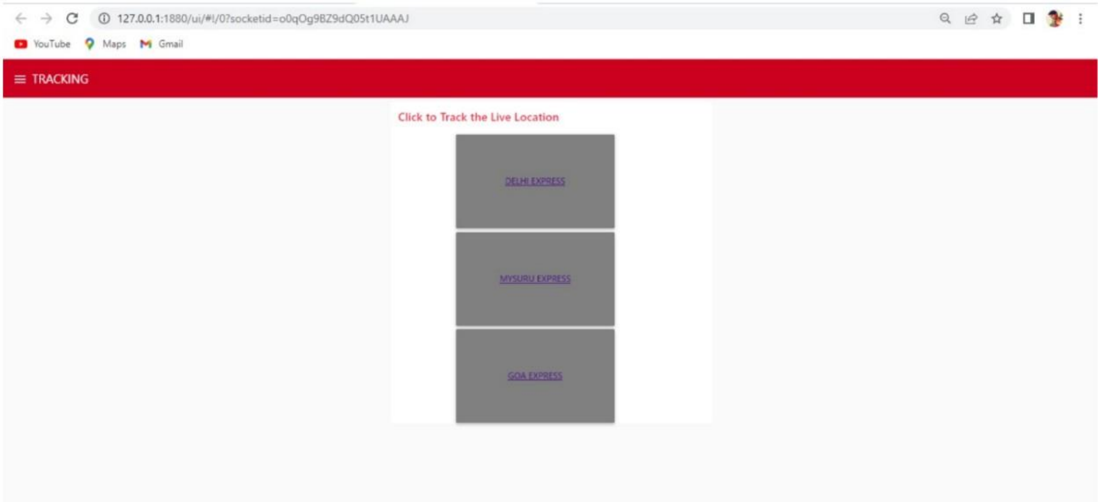
7.2 FEATURE 2

GPS TRACKING

Node RED flows:

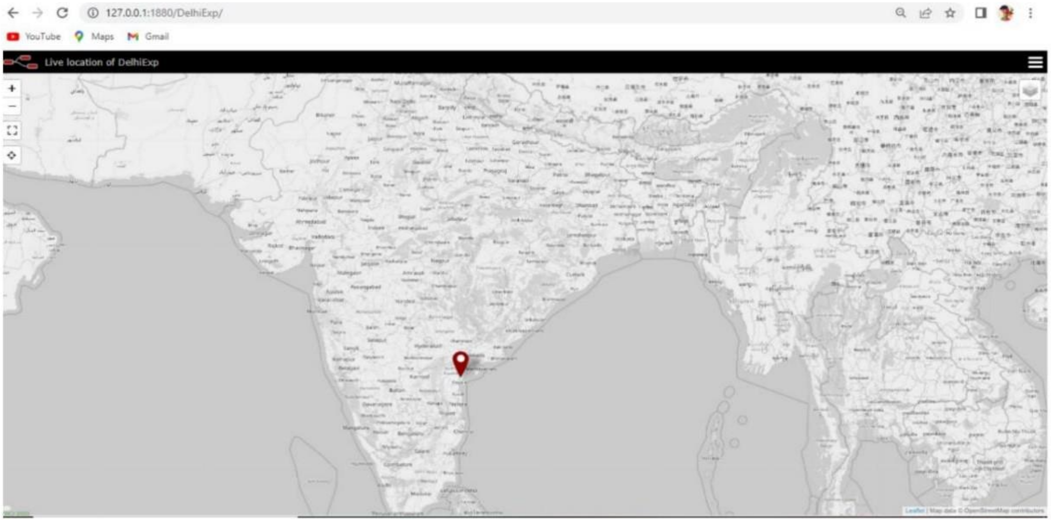


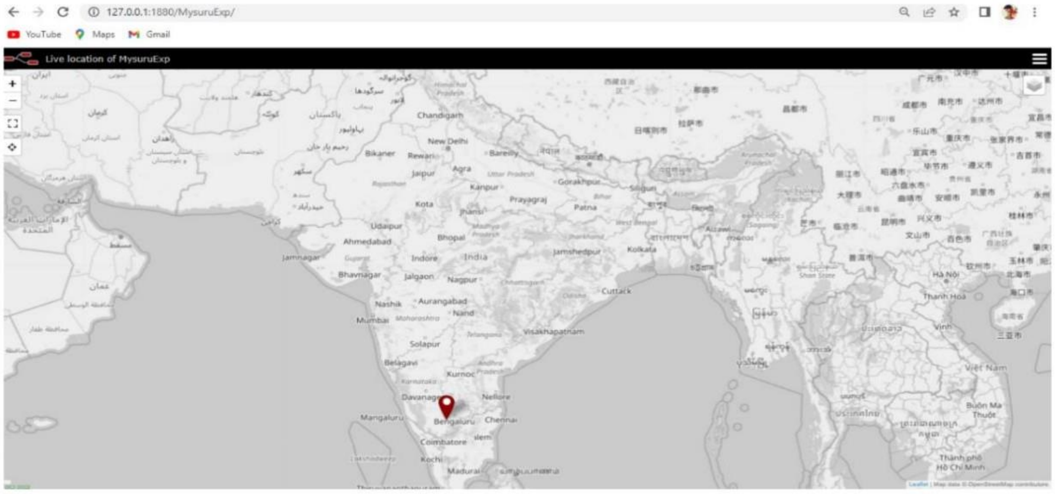
Creating Web UI for Tracking:

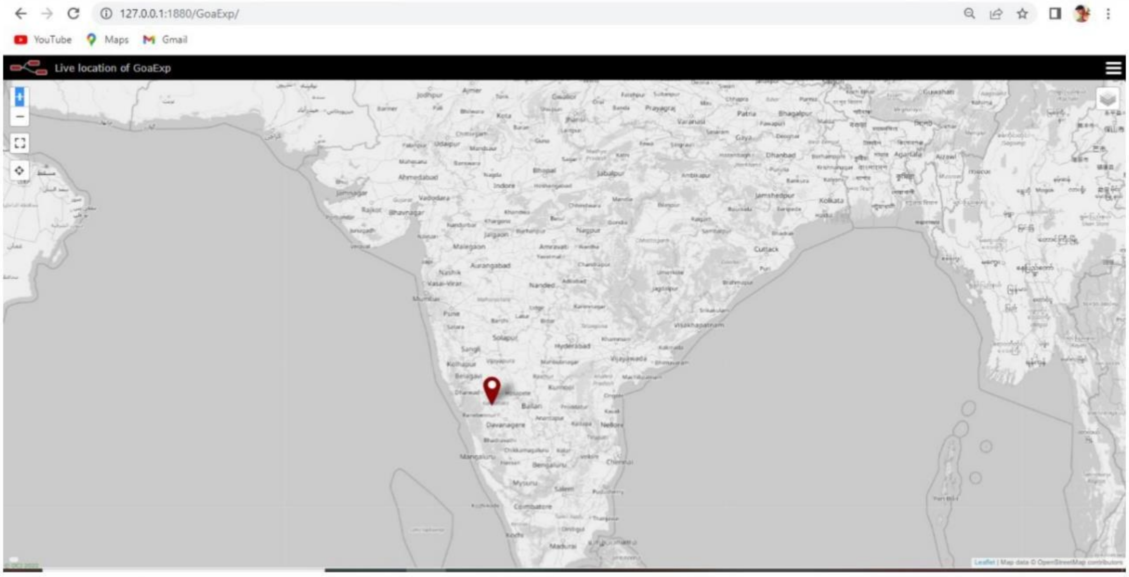


127.0.0.1:1880/ui/#!/0?socketid=o0qOg9BZ9dQ05t1UAAAJ
YouTube
Maps
Gmail
TRACKING
Click to Track the Live Location
DELHI EXPRESS
MYSURU EXPRESS
GOA EXPRESS

Train Tracking in World Map:







CODE FOR DELHI EXPRESS

```
import wiotp.sdk.device
import time
import random
myConfig = {
"identity" :{
"orgId":"njd5v1",
"typeId":"nodeMCU",
"deviceId":"Delhi_Express"
},
"auth":{
"token":"Prems1428"
}
}
def myCommandCallback(cmd):
  print("Message received fromIBM 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':'Delhi Express','lat':13.344279,'lon':80.214367}
 pub(myData)
 time.sleep(3)
 myData = {'name':'Delhi Express','lat':13.515254,'lon':80.093518}
 pub(myData)
 time.sleep(3)
 myData = {'name':'Delhi Express','lat':13.728799,'lon':80.005627}
 pub(myData)
 time.sleep(3)
 myData = {'name':'Delhi Express','lat':13.910160,'lon':79.906750}
 pub(myData)
 time.sleep(3)
 myData = {'name':'Delhi Express','lat':14.102035,'lon':79.851819}
 pub(myData)
 time.sleep(3)
 myData = {'name':'Delhi Express','lat':14.261807,'lon':79.862805}
 pub(myData)
 time.sleep(3)
 myData = {'name':'Delhi Express','lat':14.623537,'lon':79.950695}
 pub(myData)
 time.sleep(3)
 myData = {'name':'Delhi Express','lat':15.111987,'lon':79.994641}
 pub(myData)
 time.sleep(3)
 myData = {'name':'Delhi Express','lat':15.313413,'lon':80.005627}
```

```
pub(myData)
time.sleep(3)
myData = {'name':'Delhi Express','lat':15.567568,'lon':80.104504}
pub(myData)
time.sleep(3)
myData = {'name':'Delhi Express','lat':15.747405,'lon':80.269299}
pub(myData)
time.sleep(3)
myData = {'name':'Delhi Express','lat':15.821409,'lon':80.302258}
pub(myData)
time.sleep(3)
myData = {'name':'Delhi Express','lat':15.927082,'lon':80.445080}
pub(myData)
time.sleep(3)
myData = {'name':'Delhi Express','lat':16.022141,'lon':80.554943}
pub(myData)
time.sleep(3)
myData = {'name':'Delhi Express','lat':17.033801,'lon':80.295512}
pub(myData)
time.sleep(3)
myData = {'name':'Delhi Express','lat':18.383088,'lon':18.383088}
pub(myData)
time.sleep(3)
myData = {'name':'Delhi Express','lat':19.074762,'lon':79.487698}
pub(myData)
time.sleep(3)
myData = {'name':'Delhi Express','lat':20.179065,'lon':79.001439}
pub(myData)
time.sleep(3)
myData = {'name':'Delhi Express','lat':21.306421,'lon':78.789356}
pub(myData)
time.sleep(3)
myData = {'name':'Delhi Express','lat':22.518024,'lon':77.829404}
pub(myData)
time.sleep(3)
myData = {'name':'Delhi Express','lat':23.264139,'lon':77.429333}
pub(myData)
time.sleep(3)
myData = {'name':'Delhi Express','lat':24.509723,'lon':78.330212}
pub(myData)
time.sleep(3)
myData = {'name':'Delhi Express','lat':25.668840,'lon':78.451062}
pub(myData)
time.sleep(3)
myData = {'name':'Delhi Express','lat':26.177704,'lon':78.170910}
pub(myData)
time.sleep(3)
myData = {'name':'Delhi Express','lat':27.505914,'lon':77.676526}
pub(myData)
time.sleep(3)
```

```
 myData = {'name':'Delhi Express','lat':28.302041,'lon':77.308484}
 pub(myData)
 time.sleep(3)
 client.commandCallback = myCommandCallback
client.disconnect
```

CODE FOR MYSURU EXPRESS

```
import wiotp.sdk.device
import time
import random
myConfig = {
"identity" :{
"orgId":"njd5v1",
"typeId":"nodeMCU",
"deviceId":"Mysuru_Express"
},
"auth":{
"token":"Prems1428"
}
}
def myCommandCallback(cmd):
  print("Message received fromIBM 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':'Mysuru SF Express','lat':11.024938,'lon':76.982315}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Mysuru SF Express','lat':11.220325,'lon':77.570083}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Mysuru SF Express','lat':11.564960,'lon':77.993057}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Mysuru SF Express','lat':11.780142,'lon':78.037002}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Mysuru SF Express','lat':12.134824,'lon':78.130386}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Mysuru SF Express','lat':12.226105,'lon':78.091934}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Mysuru SF Express','lat':12.344187,'lon':78.037002}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Mysuru SF Express','lat':12.489034,'lon':78.009536}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Mysuru SF Express','lat':12.655239,'lon':77.866714}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Mysuru SF Express','lat':12.735622,'lon':77.756851}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Mysuru SF Express','lat':12.907020,'lon':77.696426}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Mysuru SF Express','lat':12.987323,'lon':77.646988}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Mysuru SF Express','lat':12.955205,'lon':77.509659}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Mysuru SF Express','lat':12.665958,'lon':77.136123}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Mysuru SF Express','lat':12.548022,'lon':76.921890}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Mysuru SF Express','lat':12.336809,'lon':76.644485}
    pub(myData)
    time.sleep(3)
    client.commandCallback = myCommandCallback
client.disconnect()
```

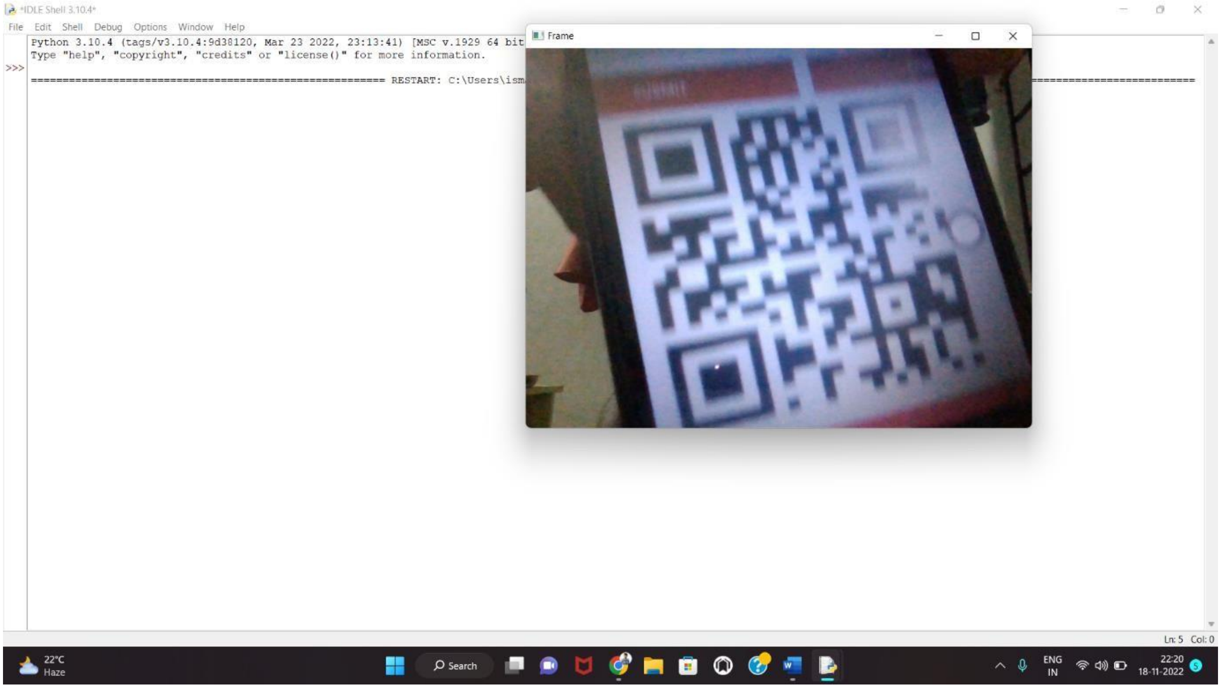
CODE FOR GOA EXPRESS

```
import wiotp.sdk.device
import time
import random
myConfig = {
"identity" :{
"orgId":"njd5v1",
"typeId":"nodeMCU",
"deviceId":"Goa_Express"
},
"auth":{
"token":"Prems1428"
}
}
def myCommandCallback(cmd):
  print("Message received fromIBM 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':'Goa Express','lat':11.688572, 'lon':78.098877}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Goa Express','lat':11.711433, 'lon':78.076905}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Goa Express','lat':11.978226, 'lon':78.116730}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Goa Express','lat':12.085676, 'lon': 78.119477}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Goa Express','lat':12.402400, 'lon':78.023347}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Goa Express','lat':12.884795, 'lon':77.707490}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Goa Express','lat':13.018630,'lon':77.614106}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Goa Express','lat':13.334194, 'lon':77.086762}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Goa Express','lat':13.299448, 'lon':76.858796}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Goa Express','lat':13.344884,'lon': 76.205109}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Goa Express','lat':13.619985, 'lon':75.966157}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Goa Express','lat':13.974739, 'lon':76.119965}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Goa Express','lat':14.423398, 'lon':75.949677}
    pub(myData)
    time.sleep(3)
    myData = {'name':'Goa Express','lat':14.922914, 'lon':75.389374}
```

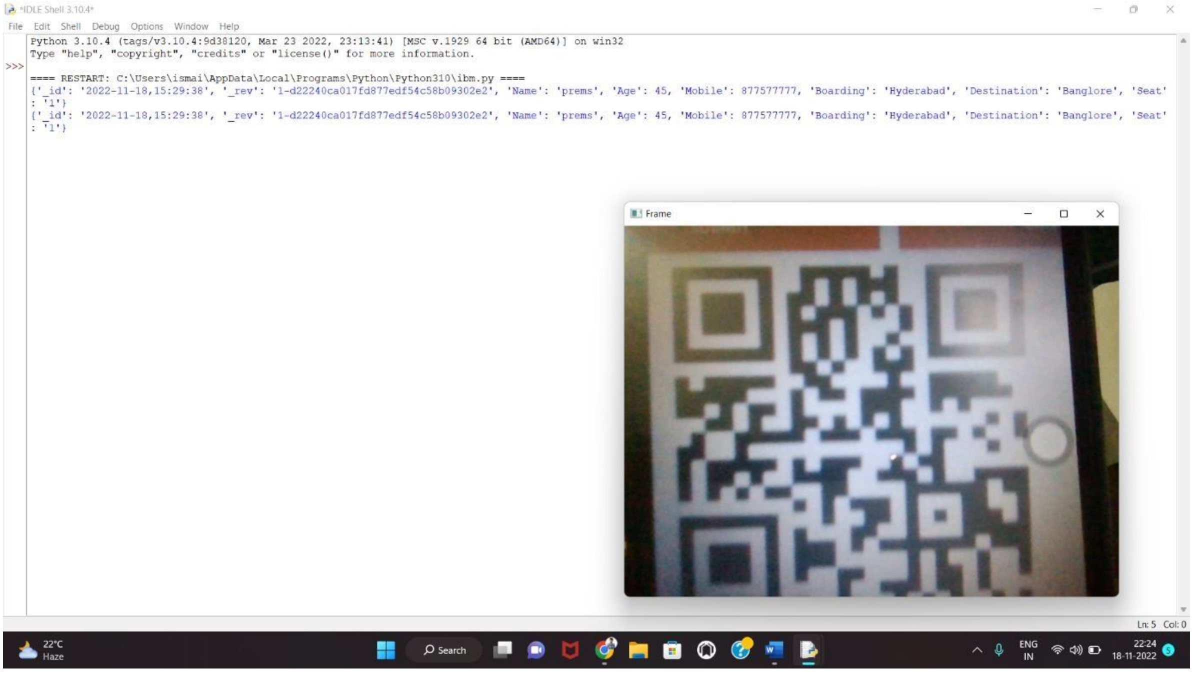
```
pub(myData)
time.sleep(3)
myData = {'name':'Goa Express','lat':15.119216, 'lon':75.389374}
pub(myData)
time.sleep(3)
myData = {'name':'Goa Express','lat':15.449980, 'lon':74.406230}
pub(myData)
time.sleep(3)
myData = {'name':'Goa Express','lat':15.352006,'lon':74.307353}
pub(myData)
time.sleep(3)
myData = {'name':'Goa Express','lat':15.314922, 'lon':74.218089}
pub(myData)
time.sleep(3)
myData = {'name':'Goa Express','lat':15.283131, 'lon':74.146678}
pub(myData)
time.sleep(3)
myData = {'name':'Goa Express','lat':15.276839, 'lon':74.129855}
pub(myData)
time.sleep(3)
time.sleep(3)
myData = {'name':'Goa Express','lat':15.282800, 'lon':74.125392}
pub(myData)
time.sleep(3)
time.sleep(3)
myData = {'name':'Goa Express','lat':15.296378,'lon':74.135692}
pub(myData)
time.sleep(3)
client.commandCallback = myCommandCallback
client.disconnect()
```

8. TESTING

Here We Get The Expected Output By Providing The Desired User Input Where The QR Code Is Generated And The Same Data Is Stored In The Form Of Json Cloudant DB



```
Python 3.10.4 (tags/v3.10.4:9d38120, Mar 23 2022, 23:13:41) [MSC v.1929 64 bit
Type "help", "copyright", "credits" or "license()" for more information.
>>>
========================================================= RESTART: C:\Users\ism
```



```
Python 3.10.4 (tags/v3.10.4:9d38120, Mar 23 2022, 23:13:41) [MSC v.1929 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
==== RESTART: C:\Users\ismai\AppData\Local\Programs\Python\Python310\ibm.py ====
{'_id': '2022-11-18,15:29:38', '_rev': '1-d22240ca017fd877edf54c58b09302e2', 'Name': 'prems', 'Age': 45, 'Mobile': 877577777, 'Boarding': 'Hyderabad', 'Destination': 'Banglore', 'Seat'
: '1'}
{'_id': '2022-11-18,15:29:38', '_rev': '1-d22240ca017fd877edf54c58b09302e2', 'Name': 'prems', 'Age': 45, 'Mobile': 877577777, 'Boarding': 'Hyderabad', 'Destination': 'Banglore', 'Seat'
: '1'}
```

9. ADVANTAGES

☆ Work load of the user is greatly reduced.

☆ Passenger’s can book tickets from their convenient place and time

☆ TTE can easily verify tickets without the need to carry several documents pertaining to passenger details.

☆ Since cloudant database retrieval is possible only for the TTE (Admin) secure data handling is made possible.

☆ Passenger’s can track the location of the train which gives them more flexibility in planning their schedules.

☆ Cost of implementation is less.

DISADVANTAGES

☆ Since the solution is built on a Web UI which requires internet facility , this may serve to be an issue.

☆ Network errors can cause serious issues while ticket booking and verification.

☆ System compatibility to adapt the user interface may limit booking facility .

☆ Tracking of trains may be an issue at unlocalized terrains.

GITHUB LINK : https://github.com/IBM-EPBL/IBM-Project-52030-1660988264

10. FUTURE SCOPE

- One of the most significant benefits of an online reservation system is that they are always open for business and can acceptbookings 24/7, so the customers don't have to wait until the next day to make a reservation or worse.

- By having an online reservation system, we're one step ahead of the game, tipping the scales in the favor when prospectsresearch and compare the capabilities against the competitors.

- We will be able to create mobile smartphone applications in the future.The framework already serves desktop computers andwe will be able to make web browsers compliant in the future.

- India is projected to account for 40% of the total global share of rail activity by 2050. This allows great potential for the onlineticket booking platform industry**.**

11. CONCLUSION

- Smart Solutions for railways is designed to reduce the work load of the user and also the use of paper.
- A Web page is designed for the public where they can book tickets by seeing the available seats.
- After booking the train, the person will get a QR code which has to be shown to the Ticket Collector while boarding the train.
- The ticket collectors can scan the QR code to identify the personal details.
- A GPS module is present in the train to track it. The live status of the journey is updated in the Web app continuously
- All the booking details of the customers will be stored in the database with a unique ID and they can be retrieved back whenthe Ticket Collector scans the QR Code.

THANK YOU