

SMART SOLUTIONS FOR RAILWAYS

PROJECT REPORT

Submitted by

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RASIPURAM 637408

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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 when the 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, Page 8-9)
- ☆ Travel, Transportation & Hospitality page on www.tcs.com
- ☆ <https://international-railway-safety-council.com/about-us>

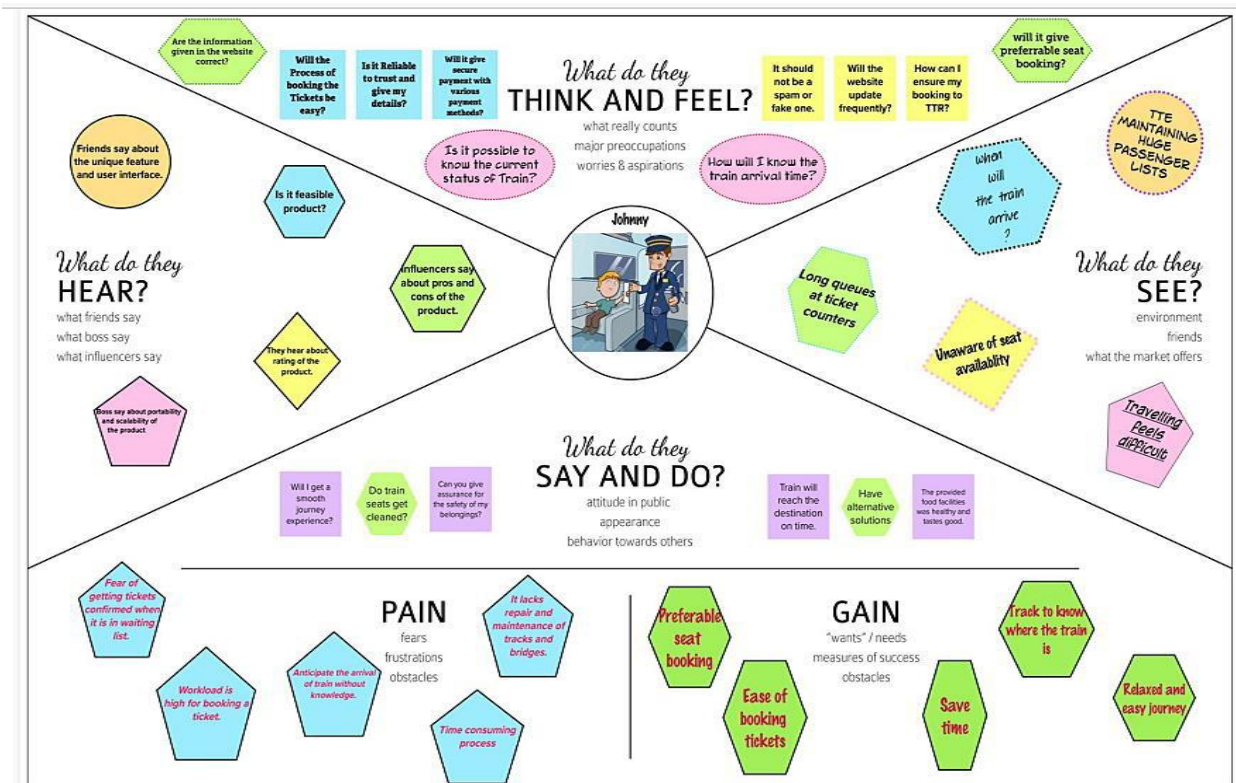
☆ <http://sts.hitachirail.com/en/products-services/glossary>

2.3 Problem Statement definition :

- Railway Passengers need a way to book their tickets easily without delay and tedious process so that the passengers get benefits 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 the train.

3. IDEATION & PROPOSED SOLUTION

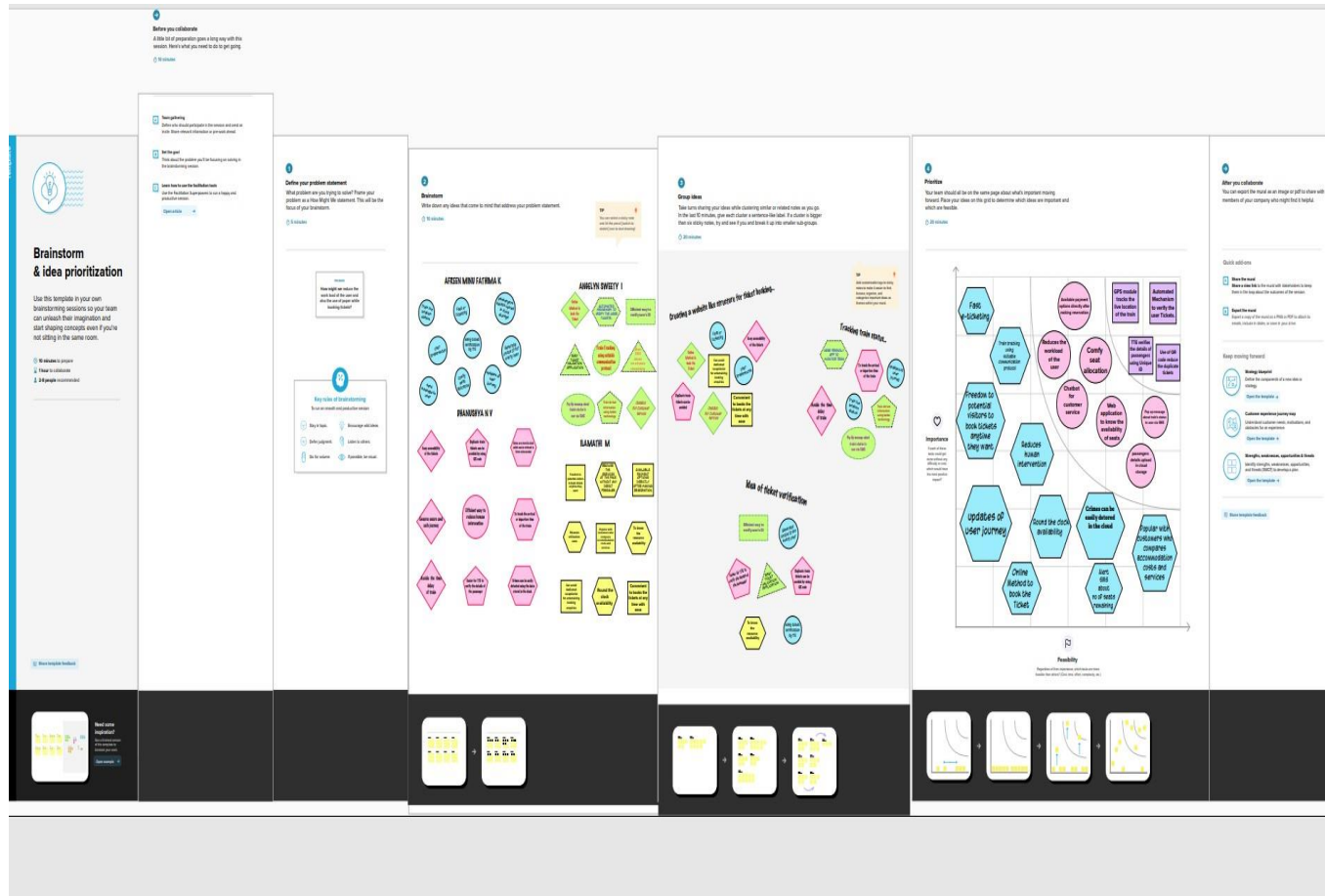
3.1 EMPATHY MAP CANVAS



Link:

[Smart solutions for railways • solnForRailways \(mural.co\)](https://solnForRailways.com)

3.2 Ideation & Brainstorming



Link:

[BRAINSTORMING • solnForRailways \(mural.co\)](https://mural.co/solnForRailways)

3.3 Proposed Solution

S.No .	Parameter	Description
<u>1</u>	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?
<u>2</u>	Idea / Solution description	A Web UI is designed to enable online ticket booking and a QR code is generated for the user who has booked the ticket to verify it with Travelling Ticket Examiner (TTE) which is done using Cloud Service.
<u>3</u>	Novelty / Uniqueness	<ul style="list-style-type: none"> ● 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 and live status is updated in the Web app.
<u>4</u>	Social Impact / Customer Satisfaction	<ul style="list-style-type: none"> ❖ 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.
<u>5</u>	Business Model (Revenue Model)	<p>→ 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.</p> <p>→ 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.</p> <p>→ 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.</p>
6	Scalability of the Solution	★ We propose a solution which works on the SaaS(Software as a Service) cloud model wherein all

		<p>necessities are deployed in the web browser which gives an easy access and also the cost is minimal which gives a scaled solution approach.</p> <p>★ The cloud is deployed as a public cloud model which gives a feasible access to upload passenger details and to retrieve data .</p> <p>★ Further a QR code is generated to hold the unique data of user in cloud, and a GPS module is attached to Iot platform in order to monitor the train location which gives an additional tracking mechanism to ensure reliability</p>
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3.4 Problem Solution fit

Define CS, fit into CL	1. CUSTOMER SEGMENT(S) CS Customers are <ul style="list-style-type: none"> • Functional traveler • Day tripper • Train lover • Leisure-hedonic traveler 	6. 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.	5. AVAILABLE SOLUTIONS AS When getting wait listed tickets, <ul style="list-style-type: none"> • 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
	2. PROBLEMS / PAINS PR <ul style="list-style-type: none"> ➢ 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 	9. PROBLEM ROOT / CAUSE RC <ul style="list-style-type: none"> ➢ 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. 	7. BEHAVIOR BE <ul style="list-style-type: none"> ➢ 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	3. TRIGGERS TO ACT TR Railway passengers see their neighbours easily booking tickets without having to wait in long lines.	10. YOUR 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.	8. CHANNELS of BEHAVIOR CH ONLINE Passengers will check on various platforms to book their tickets easily. TTE maintain details in soft copy.	Focus on PR, tap into BE, understand RC
	4. EMOTIONS EM BEFORE / AFTER 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.		OFFLINE Passengers compare different agencies to book their tickets easily. TTE will try to have passenger details in hard copy	
Identify strong TR & EM			Extract online & offline CH of BE	

4. REQUIREMENT ANALYSIS

4.1 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

4.2 Non-Functional requirement

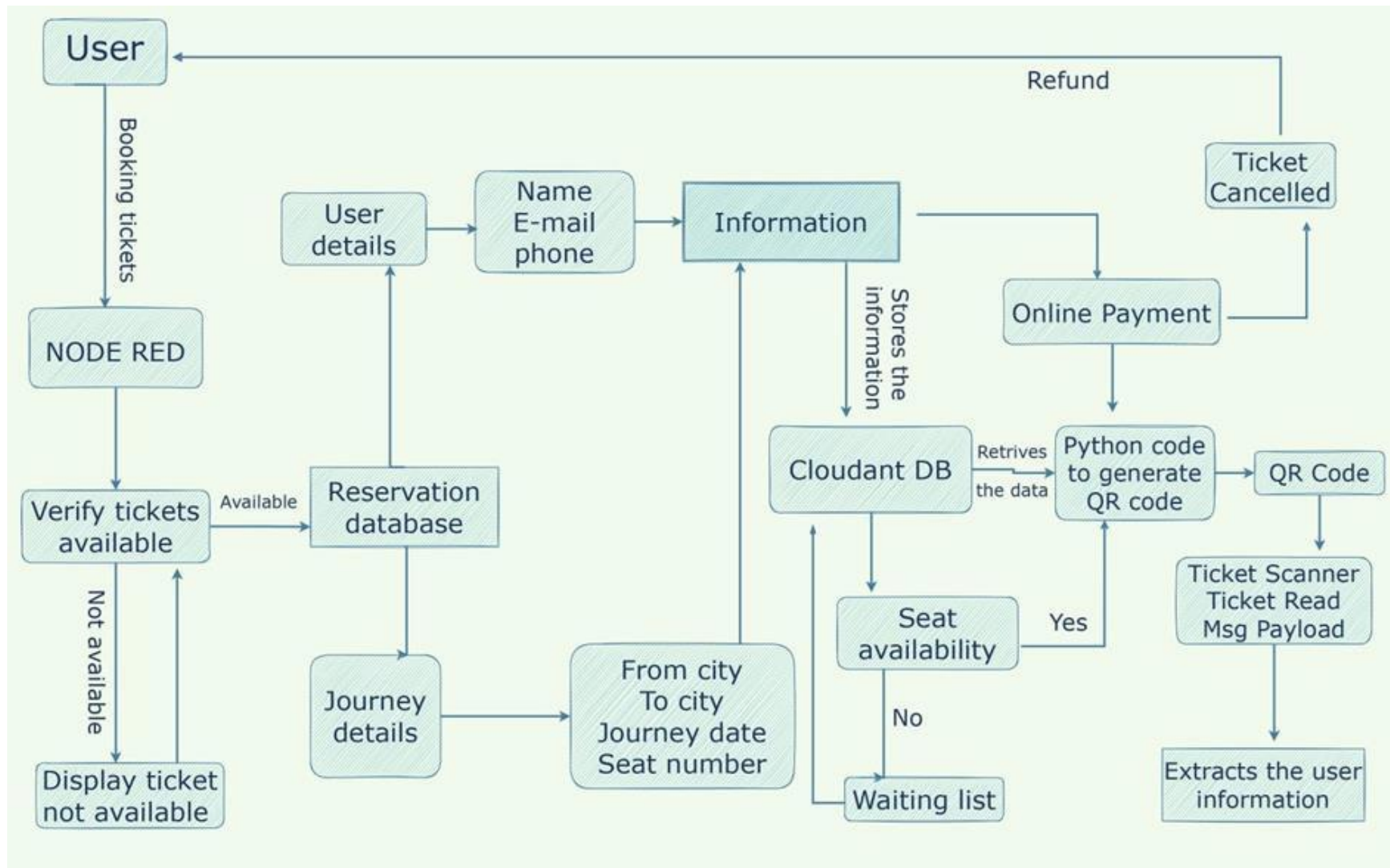
Non-functional Requirements:

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.

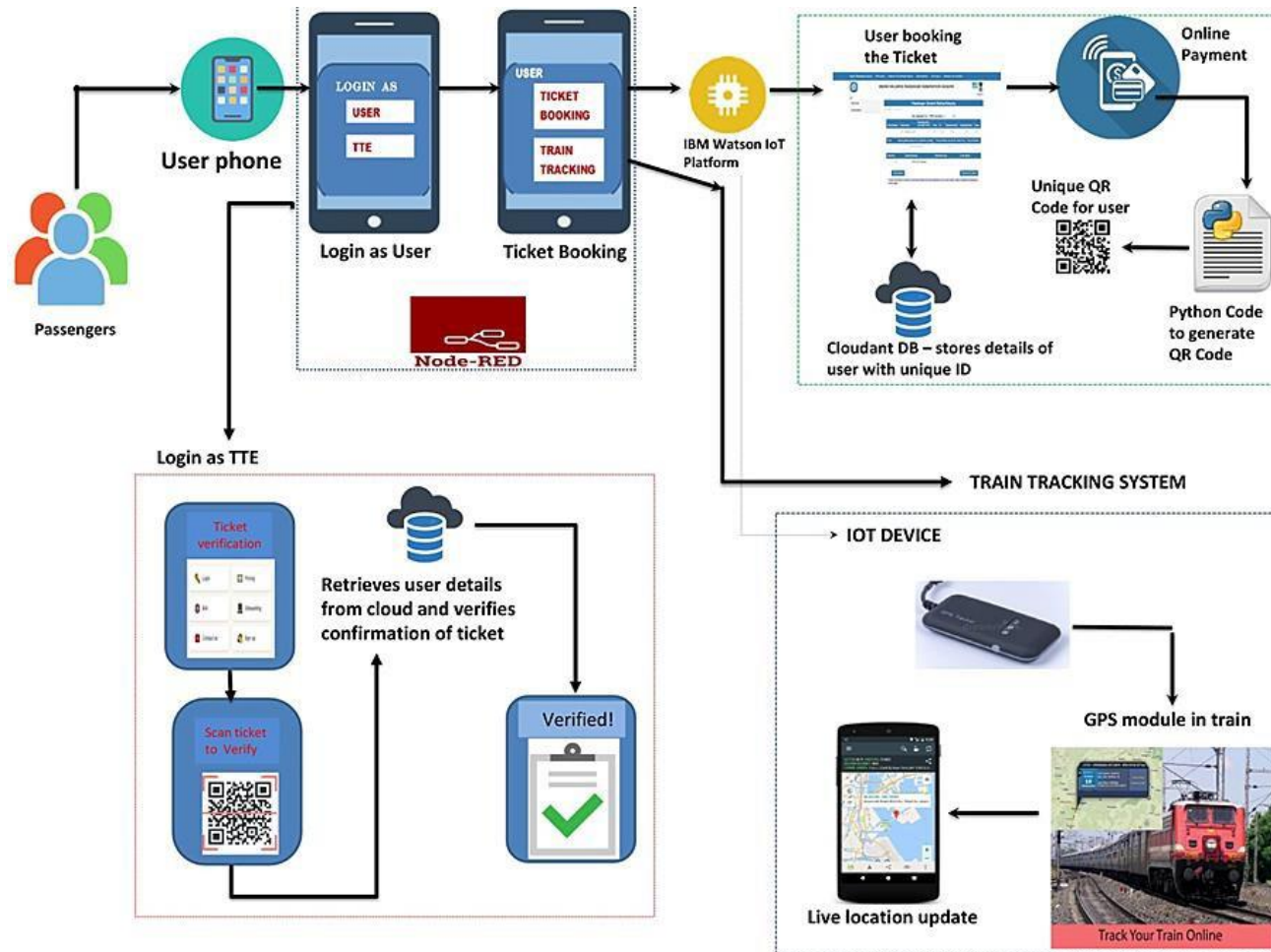
5. PROJECT DESIGN

5.1 Data Flow Diagram

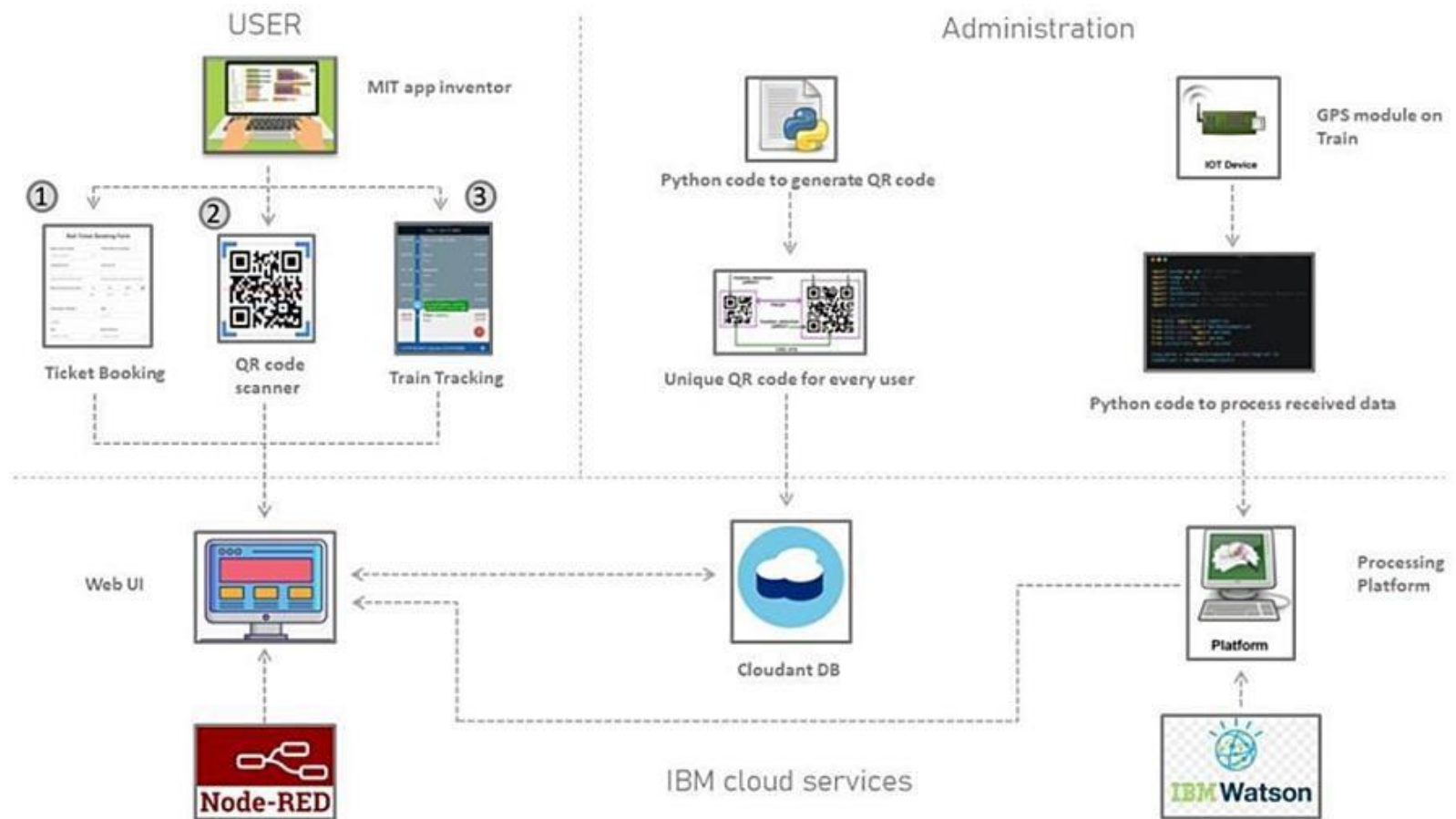


5.2 Solution and Technical Architecture

Solution Architecture:



Technical Architecture:



5.3 User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Web user)	Registration	USN-1	As a user, I can register for the website by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
	Login	USN-2	As a user, I can log into the website by entering email & password.	I can access my account / dashboard	High	Sprint-1
	Dashboard	USN-3	As a user, I can search the trains and seat availability.	I can see the booked tickets	High	Sprint-2
	Booking the Tickets	USN-4	As a user, I can book the train ticket according to my preference.	I can upload my details to fill the form for ticket booking.	High	Sprint-2
	Tracking the Train	USN-5	As a user, I can track the location of Train.	I can access the arrival time to my boarding	High	Sprint-3
Customer Care Executive	Customer Service	USN-1	As a Customer Care Executive, I can help the customers by solving their queries via chat.	I can access the Help forum.	Low	Sprint-4
Travelling Ticket Examiner (TTE- Web user)	Login	USN-1	As a TTE, I can login by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
	Dashboard	USN-2	As a TTE, I can access my dashboard showing me verified tickets.	I can see the verified and not verified tickets.	High	Sprint-2

	Ticket Verification	USN-3	As a TTE, I can verify the tickets by scanning the QR code shown by the passenger.	I can verify the Passenger's ticket.	High	Sprint-2
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6. PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority
SPRINT 1					
Sprint-1	Login	USN-1	As a Developer, I can create the login page with email & password using Node-Red App.	2	Medium
Sprint-1	Dashboard	USN-2	As a Developer, I can create a search box for the trains and seat availability.	6	High
Sprint-1	Booking the Tickets	USN-3	As a Developer, I can provide a facility to book the train ticket according to user preference.	6	High
Sprint-1	QR code Generation	USN-4	As a Developer, I can write a code to view and download the QR code for the Booked Ticket.	6	High
SPRINT 2					
Sprint-2	Login for TTE	USN-1	As a Developer,I can create the login page for TTE with email and password using the Node-red app.	6	High
Sprint-2	Dashboard	USN-2	As a Developer,I can create a drop down box for the number of passengers on board and remaining number of passengers yet to	6	High

Sprint-2	Passenger Details	USN-3	As a developer,I can provide a feature to view the passenger details which are stored in the Cloud and are retrieved and displayed in the webpage.	2	Medium
Sprint-2	Ticket verification	USN-4	As a developer,I can provide a verification mechanism to check the integrity of QR code and the passenger details.	6	High
SPRINT 3					
Sprint-3	Collaboration	USN-1	As a developer, I will provide a smooth way to book the ticket through a website and also to refund if the passenger cancels the ticket.	6	High
Sprint-3	Verifying the passenger details	USN-2	As a developer, I will check whether the passenger is taking his/her journey with a proper confirmed ticket.	6	High
Sprint-3	Identification of the passenger	USN-3	As a developer, I will make sure that the on-boarded passenger is not involved in any travel fraudulently.	2	Medium
Sprint-3	Verifying the tickets	USN-4	As a developer, I will scan the QR code generated by python code to extract and verify the passenger details.	6	High
SPRINT 4					
Sprint-4	Tracking webpage	USN-1	As a developer , I can create web page to view train status using Node RED	6	High
Sprint-4	Live location details	USN-2	As a developer I can extract details from IoT device using python code and IBM watson.	6	High

Sprint-4	Retrieving from cloud	USN-3	As a developer, I can upload the details to cloud and display it to user by connecting it with Node RED application.	6	High
Sprint-4	Sending updates	USN-4	As a passenger ,I would like to receive updates over my train status during my journey via fast SMS or App notification.	2	Medium

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	07 Oct 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	10 Oct 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	15 Oct 2022

6.3 Reports from JIRA:

The screenshot displays the Jira Software interface for a project named "Smart Solutions for Railways". The main view is "Sprint 2", which is part of the "Website Backend Process". The board is organized into three columns: "TO DO", "IN PROGRESS", and "DONE 4 ISSUES". The "DONE" column contains three issues:

- Issue SSFR-9: "As a developer, I can provide a verification mechanism to check the integrity of QR code and the passenger details." (Status: Done)
- Issue SSFR-8: "As a developer, I can provide a feature to view the passenger details which are stored in the Cloud and are retrieved and displayed in the webpage." (Status: Done)
- Issue SSFR-7: "As a Developer, I can create the login page for TTE with email and password using the Node-..." (Status: Done)

The left sidebar shows the project navigation menu, including "PLANNING" (Roadmap, Backlog, Board) and "DEVELOPMENT" (Code, Project pages, Add shortcut, Project settings). The top navigation bar includes "Jira Software", "Your work", "Projects", "Filters", "Dashboards", "People", "Apps", and a "Create" button. A search bar and user avatars are also present.

Projects / Smart Solutions for Railways

Backlog

a.

e

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Epic

Insights

▼ Sprint 2 11 Nov- 18 Nov (4 issues)

Website Backend Process

D 55-FR-9 As a developer,I can provide a verification mechanism to check the integrity of QR code and the passenger details.

1J 55fR-8 As a developer,!can provide a feature to view the passenger details which are stored in the Cloud and are retrieved and displayed in the webp..

D 55fR--6 As a Developer,! can create the login page for TTEwith email and password using the Node-red app.

1J 55fR--1t As a Developer,I can create a drop down box for the number of passengers on boarded and remaining number of passengers yet to be board..

+ Create issue

Smart Solutions for Ra...

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PLANNING

Roadmap

Backlog

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DEVELOPMENT

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(!) Project p qes

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You'm in a twi;lm m1r1e9ed project

Projects / Smart Solutions for Railways

Backlog

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Epic

Insights

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filling and v,rtification

D Asa developer, I will provide a smooth way to book the ticket through a website and Iso to refund if the...

C 55-FA--9 As a developer, I will check whether the passenger 1s tokir,g his/her jourr,ey with o proper confirmed ticket.

D As a developer, I will m.oke s1.1re that the or,-boarded passenger is not itwolved in any travel frauduler, -ly





D 55--FR-r+ As o developer, I will scan the QR code generated by python code to extri'let ;ind verify the p;;-issenger det ...


+ Create Issue

Jira Software


Your work ▾Projects ▾Filters ▾Dashboards ▾People ▾Apps ▾Create


Q Search




Smart Solutions for Ra...
Software project


PLANNING


Roadmap


Backlog

Board

DEVELOPMENT

Code

Project pages

Add shortcut



You're in a team-managed project

Learn more

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Projects / Smart Solutions for Railways


Backlog


Epic ▾


Insights


▼ Sprint 4 14 Nov – 19 Nov (4 issues)


GPS tracking System


55FR-22 As a developer , I can create web page to view train status using Node RED


DONE ▾


55FR-23 As a developer I can extract details from IoT device using python code and IBM watson.

DONE ▾

55FR-24 As a developer, I can upload the details to cloud and display it to user by connecting it with Node RED a...

DONE ▾

55FR-25 As a passenger ,I would like to receive updates over my train status during my journey via fast SMS or Ap...

DONE ▾

+ Create issue

7. CODING & SOLUTIONING

7.1 Feature 1

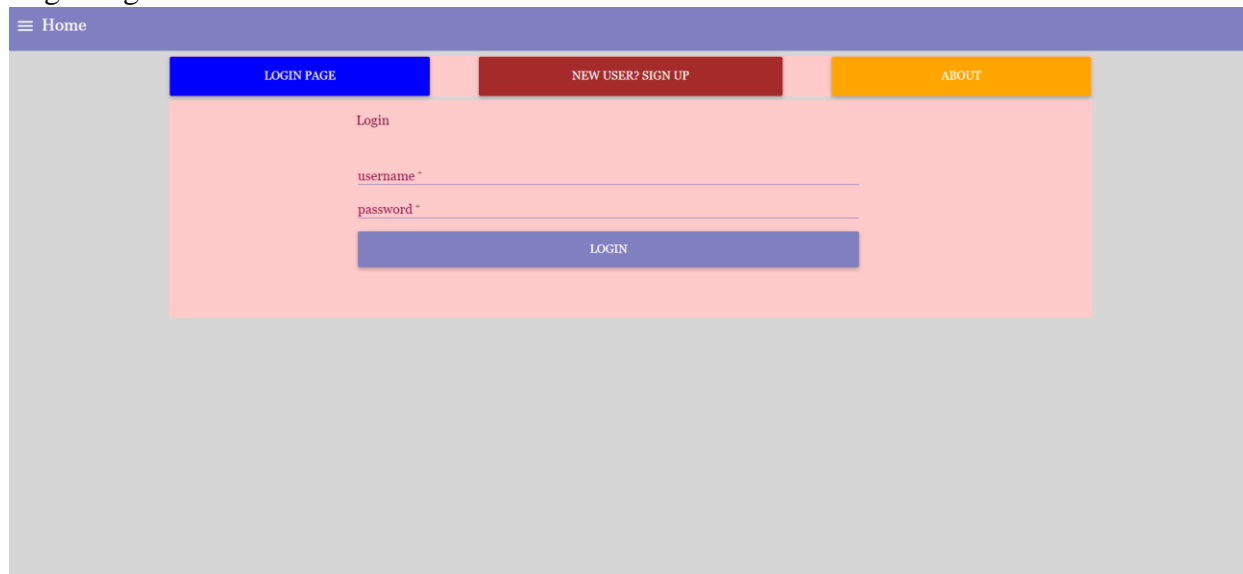
Train Ticket booking and QR code generation

Description:

In feature 1 we have designed a webpage using node red to book the train ticket. The user can login in into the webpage using username and password . After successful login, the user wil be redirected to the Ticket booking form. In this form ,users are asked to fill the personal details and the jouney details . After entering the appropriate details the confirmation message is shown and QR code is generated.

HOME PAGE :

Login Page



The image shows a login page mockup. At the top is a purple header bar with a hamburger menu icon and the text 'Home'. Below the header is a navigation bar with three buttons: 'LOGIN PAGE' (blue), 'NEW USER? SIGN UP' (dark red), and 'ABOUT' (yellow). The main content area has a light gray background. In the center is a pink rectangular box containing the login form. The form has the title 'Login' at the top. Below it are two input fields: 'username *' and 'password *'. At the bottom of the form is a blue button labeled 'LOGIN'.

Sign up page

≡ Home

LOGIN PAGE

NEW USER? SIGN UP

ABOUT

Sign Up

Choose a username *

Choose a password *

Enter your email address *

Enter your Phone Number *

SUBMIT

CANCEL

About

≡ Home

LOGIN PAGE

NEW USER? SIGN UP

ABOUT

About

Book Easy

Book Easy App helps you to book the ticket at your comfort zone and place.

Our App breaks the usual way to book the train ticket.

Benefits of using our App

- Online Ticket Booking
- Automated Ticket verification
- Work Load reduction for user

Ticket booking Form:

≡ passenger

BOOK A TICKET!

CHECK STATUS

From

salem

▼

To:

goa

▼

Seat

Select option

▼

Seat preference

Asile

▼

Date of Journey

10/11/2022

▼

Name *

Age *

Mobile Number *

LOGOUT

SUBMIT

CANCEL

BACK

QR code Generation :

passenger

BOOK A TICKET! CHECK STATUS

From coimbatore

To: mysore

Seat Select option

Age *

Mobile Number *

LOGOUT SUBMIT CANCEL

BACK

QR Code

{ "name": "Anu", "age": 20, "no": 9634589710 }

Ticket is Booked

OK

passenger

BOOK A TICKET! CHECK STATUS

From coimbatore

To: mysore

Seat Select option

Seat preference Middle

Date of Journey 12/11/2022

Name *

Age *

Mobile Number *

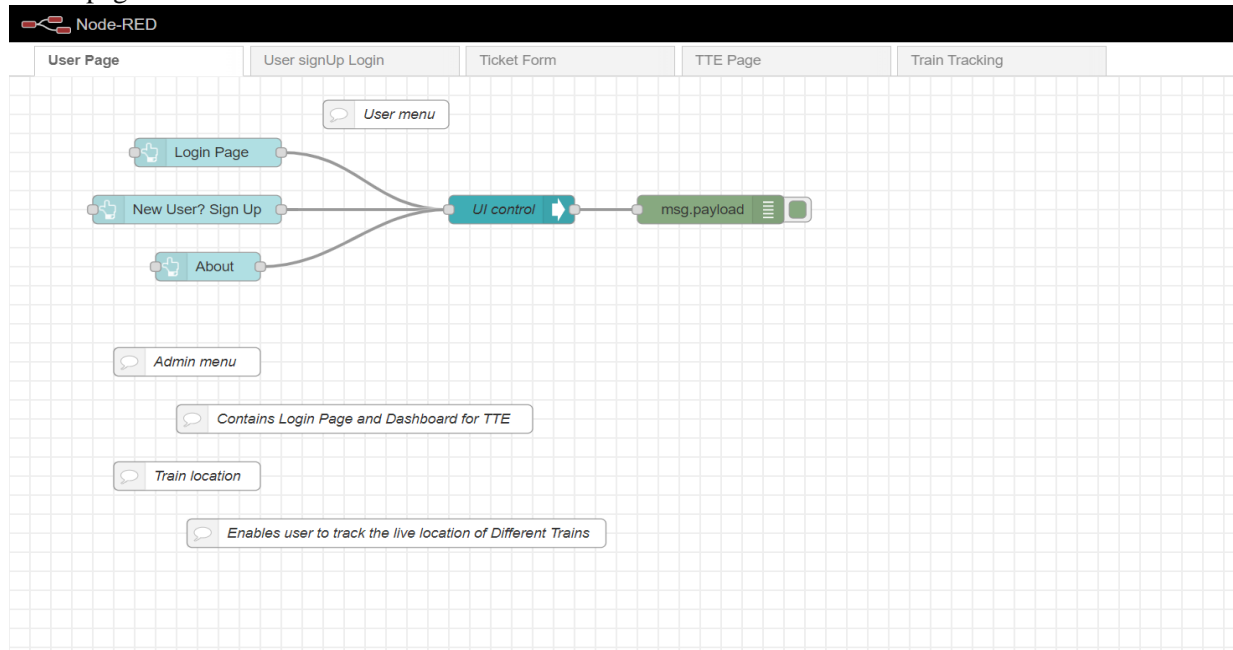
LOGOUT SUBMIT CANCEL

BACK

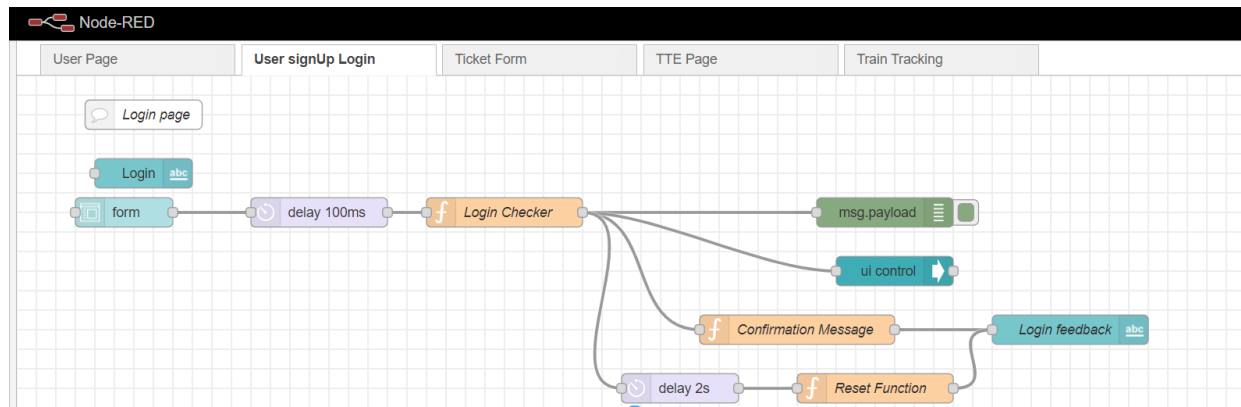
QR Code

NODE RED FLOWS :

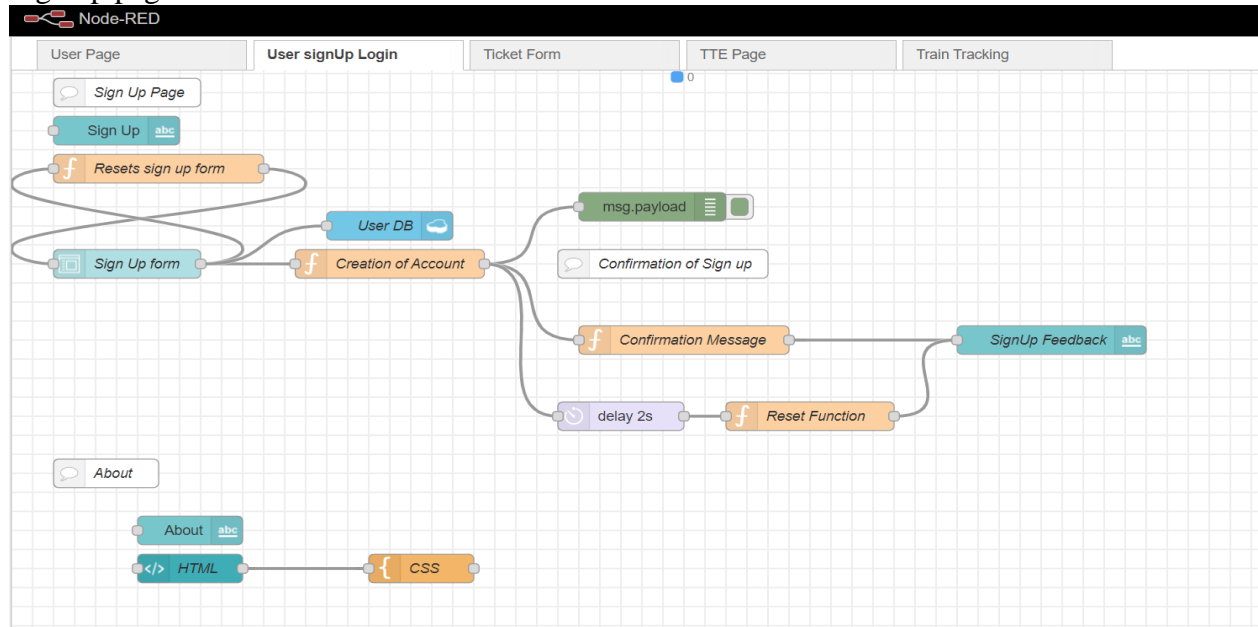
Home page



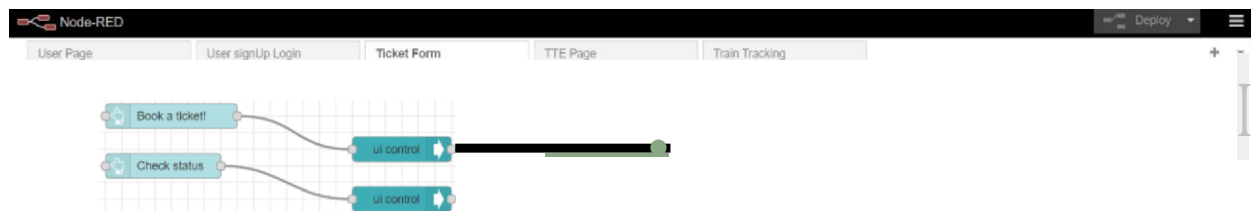
Login page



Sign up page



Ticket Booking Form



From	Boarding deta,Js
To:	Destination details
Seckt preference	Seat preference
Date of Journey	Date of journey
Logout	ui control



Node-RED

0. filter nodes

▼ common

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debug

complete

! catch

status

link in

 link call

[Imkout](#)

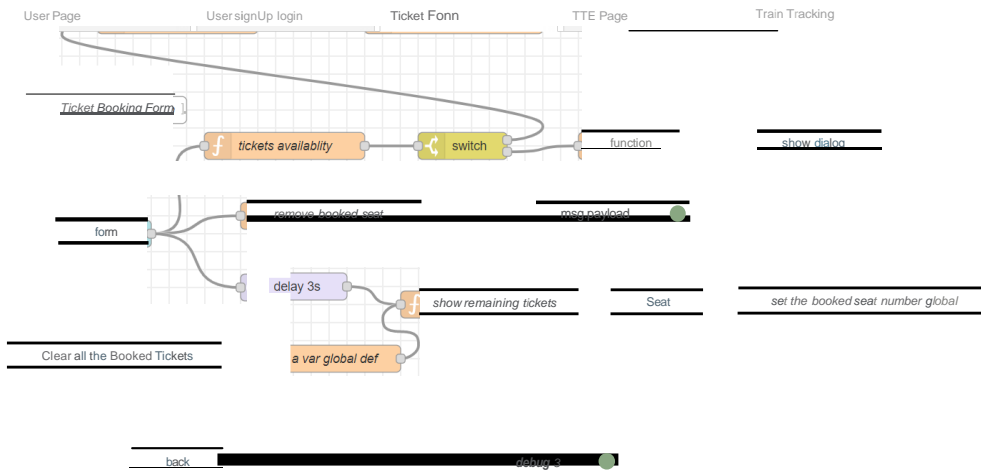
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function

switch

change

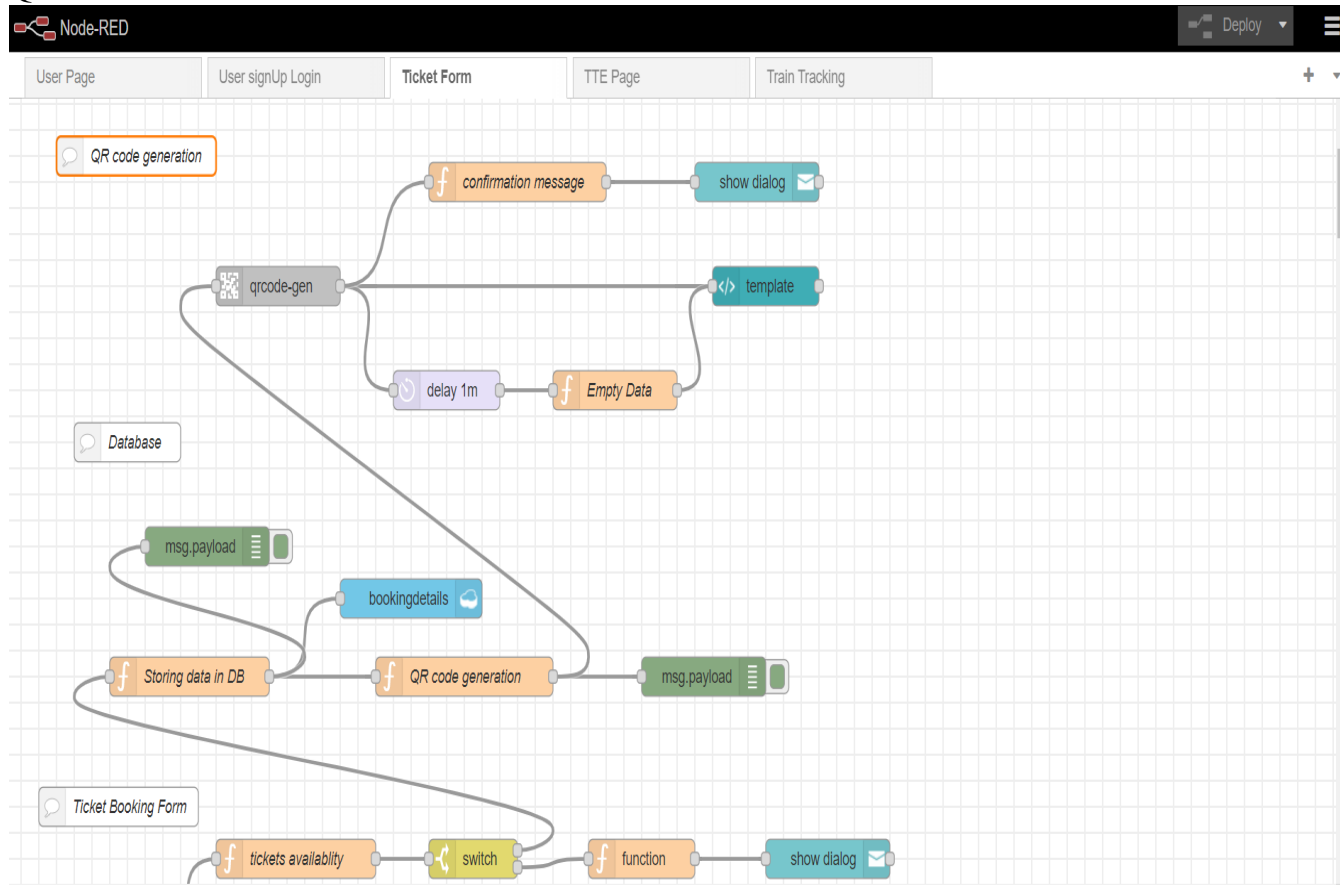


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 $+$ \bullet

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QR GENERATION :



7.2 Feature 2

TICKET VERIFICATION AND TRAIN TRACKING

DESCRIPTION:

In this we have included a feature to verify the ticket by using the QR code scanner at TTE side and retrieve the passenger details from the Cloudant database to check the details of the passenger. If it is a valid QR code then the ticket is verified. For an invalid QR code the pop up message is displayed "INVALID TICKET".

For Train tracking the current location status of the train is displayed in the webpage. The users can easily know about the arrival and departure of the train.

TICKET VERIFICATION :

passenger

BOOK A TICKET!

CHECK STATUS



From

chennai

To:

delhi

Seat

Select option

Seat preference

Middle

Date of Journey

12/11/2022

Name *

Age *

Mobile Number *

LOGOUT

SUBMIT

CANCEL

BACK

Python 3.7.0 Shell

File Edit Shell Debug Options Window Help

Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:59:51) [MSC v.1914 64 bit (AMD64)] on win32
Type "copyright", "credits" or "license()" for more information.
>>>
RESTART: C:\Users\anigrace\Desktop\IBM PROJECT\1_SUBMITTED WORK\project dev\QR_Code_Verification.py
2022-11-12 09:26:01,085 wiotp.sdk.device.client.DeviceClient INFO Connected successfully: d:ryc4pr:QR_Reads:876543
{'_id': '7d4468aa6af0320aad446b48437155c4', '_rev': '1-ca84927463bfd9b1b546d78c42c2ccaf', 'payload': {'unique': '2022-11-12,09:25:01', 'Name': 'Rajkamali', 'Age': 40, 'Mobile': 7898125674, 'Boarding': 'chennai', 'Destination': 'delhi', 'Seat': 2, 'Seat preference': 'Middle', 'Date of Journey': 1669680000000}, 'topic': {'name': 'Rajkamali', 'age': 40, 'no': 7898125674}, 'socketid': '1Kg23JbMH4I10KWeAAI3'}}

Published data Successfully: %s {'_id': '7d4468aa6af0320aad446b48437155c4', '_rev': '1-ca84927463bfd9b1b546d78c42c2ccaf', 'payload': {'unique': '2022-11-12,09:25:01', 'Name': 'Rajkamali', 'Age': 40, 'Mobile': 7898125674, 'Boarding': 'chennai', 'Destination': 'delhi', 'Seat': 2, 'Seat preference': 'Middle', 'Date of Journey': 1669680000000}, 'topic': {'name': 'Rajkamali', 'age': 40, 'no': 7898125674}, 'socketid': '1Kg23JbMH4I10KWeAAI3'}}

≡ TTE_dashboard

Welcome! The Details of scanned QR code is shown below:

{"_id":"7d4468aa6af0320aad446b48437155c4","_rev":"1-ca84927463bfd9b1b546d78c42c2ccaf","payload":{"unique":"2022-11-12,09:25:01","Name":"Rajkamali","Age":40,"Mobile":7898125674,"Boarding":"chennai","Destination":"delhi","Seat":2,"Seat preference":"Middle","Date of Journey":1669680000000},"topic":{"name":"Rajkamali","age":40,"no":7898125674},"socketid":"1Kg23JbMH4I10KWeAAI3"}}

LOGOUT

CLEAR ALL THE BOOKED TICKETS

INVALID TICKET :

demo



Published data Successfully: %s {'Error': 'Not a Valid Ticket'}

Not a Valid Ticket

≡ TTE_dashboard

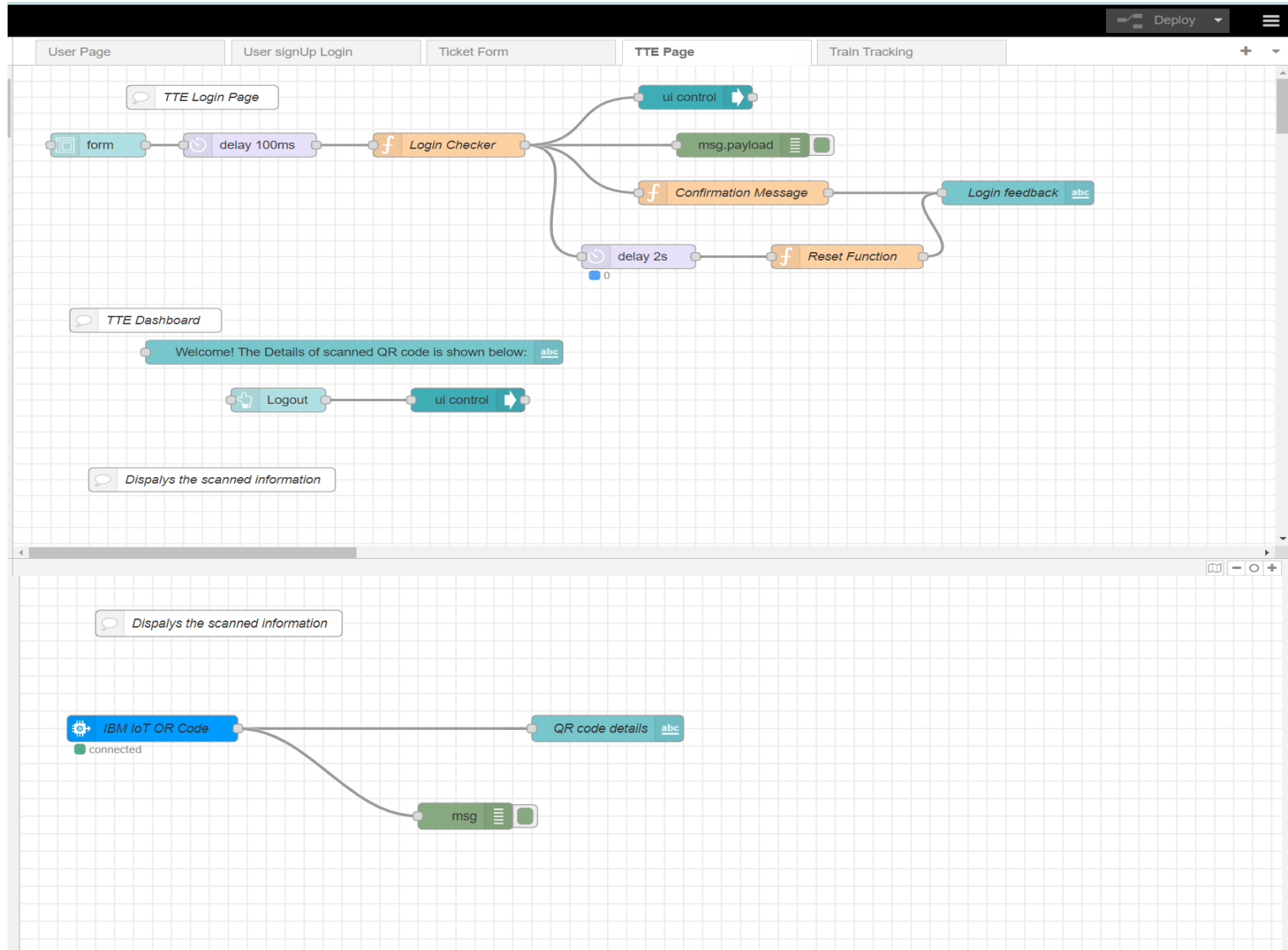
Welcome! The Details of scanned QR code is shown below:

{"Error": "Not a Valid Ticket"}

LOGOUT

CLEAR ALL THE BOOKED TICKETS

NODE RED FLOWS :



PYTHON CODE FOR TICKET VERIFICATION:

```
import cv2 as cv
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
import wiotp.sdk.device
authenticator=BasicAuthenticator('apikey-v2-1w8tqt2prt3j7qz9d1rgrxhar3w9v43i2359u79ut5jb','86181a38eca19ae487f512b10aca0c80')
service=CloudantV1(authenticator=authenticator)
service.set_service_url('https://apikey-v2-1w8tqt2prt3j7qz9d1rgrxhar3w9v43i2359u79ut5jb:86181a38eca19ae487f512b10aca0c80@9163f25a-10b8-4374-a8de-cb92e4357567-bluemix.cloudantnosqldb.appdomain.cloud')

cap = cv.VideoCapture(0)
font = cv.FONT_HERSHEY_PLAIN
if not cap.isOpened():
    print("Cannot open camera")
    exit()

myConfig = {
    "identity" :{
        "orgId":"ryc4pr",
        "typeId":"QR_Reads",
        "deviceId":"876543"
    },
    "auth":{
        "token":"GGHvsi!XL-i7x0mC6B"
    }
}

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=response, qos=0, onPublish=None)
    print("Published data Successfully: %s",response)
    print("\n")

while True:
    ret, frame=cap.read()
    decodedObjects = pyzbar.decode(frame)
    if not ret:
        print("Can't receive frame (stream end?). Exiting ...")
        break
    for obj in decodedObjects:
        a=obj.data.decode('UTF-8')
        cv.putText(frame, "Ticket", (50,50),font,2,
                    (255 ,0, 0),3)

    try:
        response=service.get_document(
            db='bookingdetails',
            doc_id = a
        ).get_result()
        print(response)
        print("\n\n")
        pub(response)
        time.sleep(5)
    except Exception as e:
        response={'Error':'Not a Valid Ticket'}
        pub(response)
        print("Not a Valid Ticket")
        print("\n\n")
        time.sleep(5)

cv.imshow("Frame" ,frame)

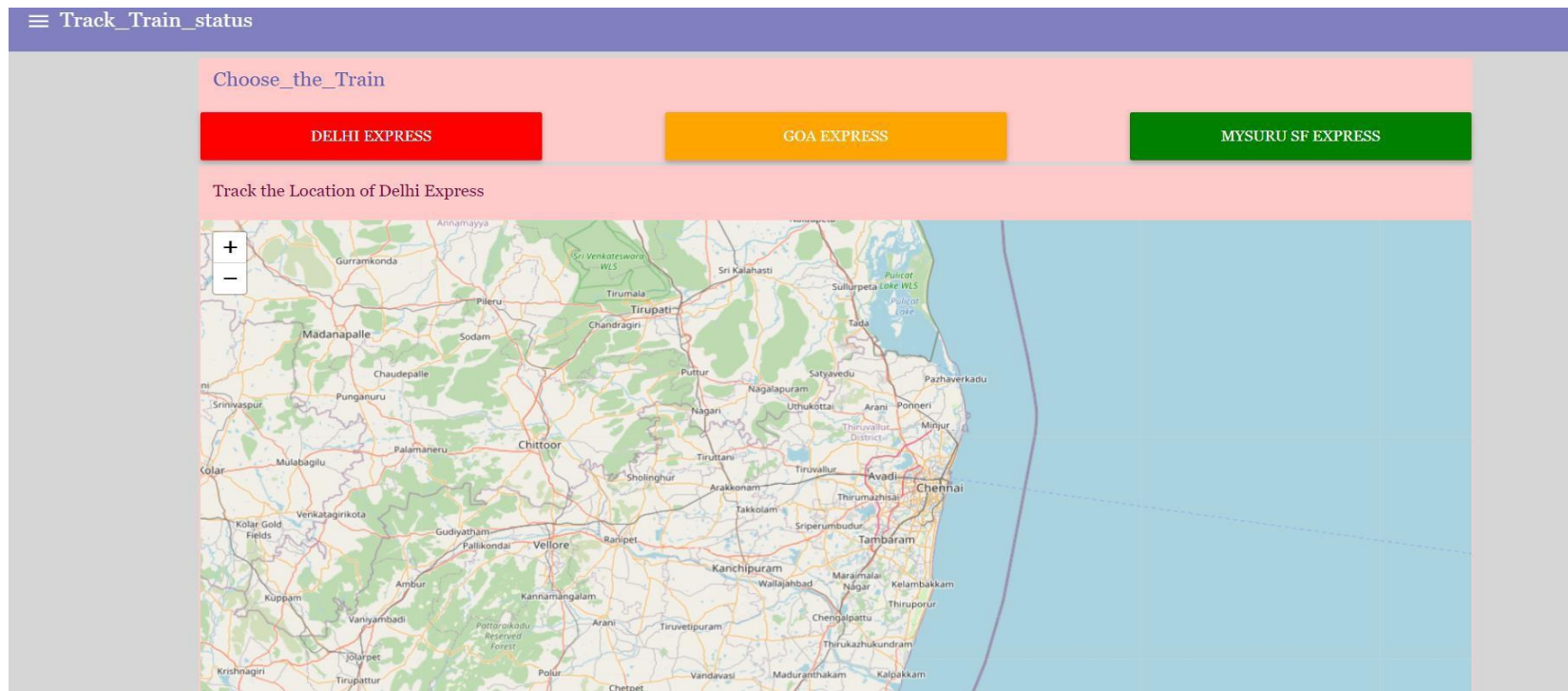
```

```

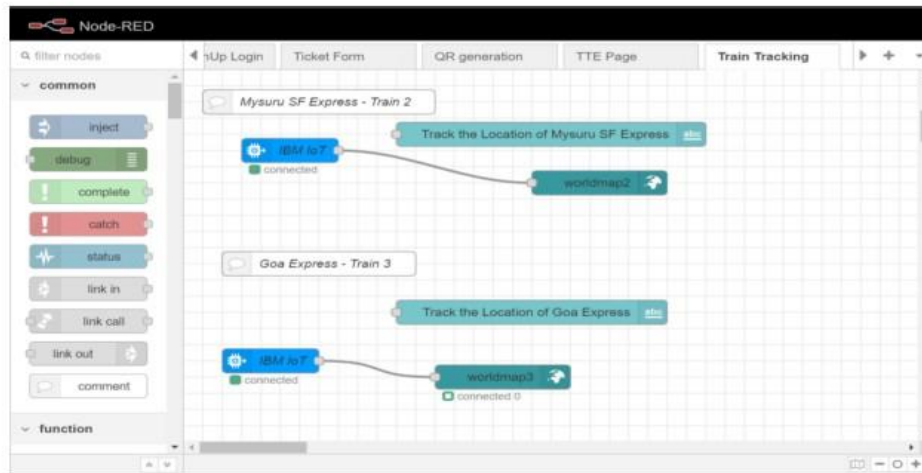
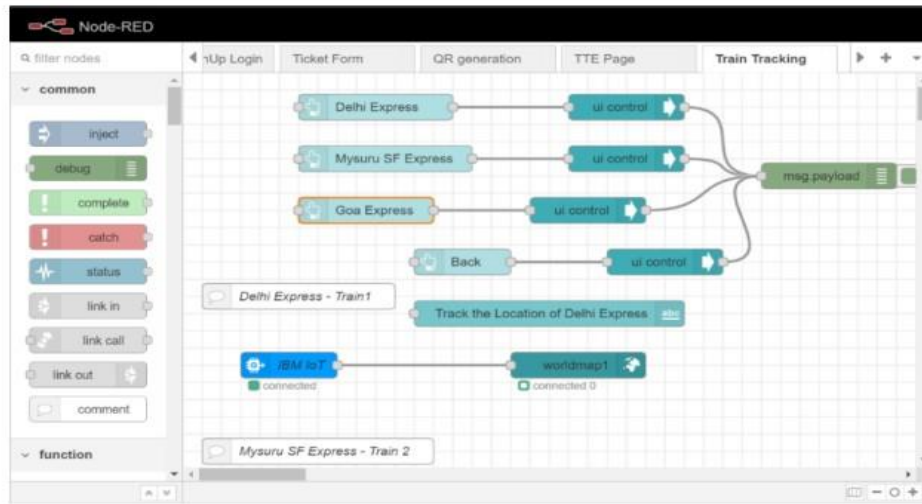
if cv.waitKey(1) & 0xFF == ord('q'):
    break
client.commandCallback = myCommandCallback
cap.release()
cv.destroyAllWindows()
client.disconnect()

```

TRAIN TRACKING STATUS :



Node red flow for train tracking:



IBM Watson IOT device

IBM Watson IoT Device:

The screenshot shows the IBM Watson IoT Platform interface for device 323465. The device is in a 'Disconnected' state. The 'Recent Events' tab is selected, displaying a table of events. The events are status updates from a 'Dello Express' device, each with a unique ID and a timestamp. The last received time for all events is 'a few seconds ago'. There are 2 simulations running.

Event	Value	Format	Last Received
status	["name":"Dello Express","lat":15.927082,"lon":8...	json	a few seconds ago
status	["name":"Dello Express","lat":15.821409,"lon":8...	json	a few seconds ago
status	["name":"Dello Express","lat":15.747605,"lon":8...	json	a few seconds ago
status	["name":"Dello Express","lat":15.347544,"lon":8...	json	a few seconds ago

2 Simulations running

The screenshot shows the IBM Watson IoT Platform interface for device 6789910. The device is in a 'Disconnected' state. The 'Recent Events' tab is selected, displaying a table of events. The events are status updates from a 'Gox Express' device, each with a unique ID and a timestamp. The last received time for all events is 'a few seconds ago'. There are 2 simulations running.

Event	Value	Format	Last Received
status	["name":"Gox Express","lat":15.314922,"lon":74...	json	a few seconds ago
status	["name":"Gox Express","lat":15.352006,"lon":74...	json	a few seconds ago
status	["name":"Gox Express","lat":15.44990,"lon":74...	json	a few seconds ago
status	["name":"Gox Express","lat":15.319216,"lon":75...	json	a few seconds ago
status	["name":"Gox Express","lat":14.922954,"lon":75...	json	a few seconds ago

2 Simulations running

The screenshot shows the IBM Watson IoT Platform interface for device 6789920. The device is in a 'Disconnected' state. The 'Recent Events' tab is selected, displaying a table of events. The events are status updates from a 'Myaura SF Express' device, each with a unique ID and a timestamp. The last received time for all events is 'a few seconds ago'. There are 2 simulations running.

Event	Value	Format	Last Received
status	["name":"Myaura SF Express","lat":12.987323,"lon":79...	json	a few seconds ago
status	["name":"Myaura SF Express","lat":12.987002,"lon":79...	json	a few seconds ago
status	["name":"Myaura SF Express","lat":12.735623,"lon":79...	json	a few seconds ago
status	["name":"Myaura SF Express","lat":12.655...	json	a few seconds ago

2 Simulations running

Python codes for train tracking

```

import wiotp.sdk.device
import time
import random
myConfig = {
    "identity" :{
        "orgId":"ytluse",
        "typeId":"2702",
        "deviceId":"12345"
    },
    "auth":{
        "token":"O+n)Eh+lNX0y3?rG!8"
    }
}
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()
```

Train 2:

```
import wiotp.sdk.device
import time
import random
myConfig = {
    "identity": {
        "orgId": "ytluse",
        "typeId": "train2",
        "deviceId": "mysore"
    },
    "auth": {
        "token": "-BCOX+hMk?*@xc@AV9"
    }
}
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':'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()

```

Train 3:

```

import wiotp.sdk.device
import time
import random
myConfig = {
    "identity":{
        "orgId":"ytluse",
        "typeId":"2702",
        "deviceId":"678910"
    }
}

```

```

    },
    "auth":{
        "token":"4skuC*xkhDH&la(CUR"
    }
}
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}

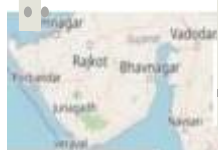
```

```
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()
```

TRAIN TRACKING PAGE

Track the location of Delhi Express



7.3 DATABASE SCHEMA

 Databases

Database name ▼

 Create Database

{ } JSON







Your Databases


Name	Size	# of Docs	Partitioned	Actions
bookingdetails	5.6 KB	31	No	  

bookingdetails > 04af376033d78b40f55b3ffcf3cbb5d0


{ } JSON







 Save Changes

Cancel

 Upload Attachment

 Clone Document

 Delete

```
1  {
2    "_id": "04af376033d78b40f55b3ffcf3cbb5d0",
3    "_rev": "1-a93eaca451bf2ce234704c6979ea3933",
4    "unique": "2022-11-11,18:04:38",
5    "Name": "demo123",
6    "Age": 33,
7    "Mobile": 43267,
8    "Boarding": "salem",
9    "Destination": "goa",
10   "Seat": 5,
11   "Seat preference": "Middle",
12   "Date of Journey": 1669075200000
13 }
```

Log Out

8. Testing

8.1 Testcase

Test case ID	Feature Type	Component	Test Scenario	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Comments	TC for Automation(Y/N)	BUG ID	Executed By
HomePage_TC_001	Functional	Home Page	Verify user is able to see the Login/Signup popup when user clicked on My account button	1.Enter URL and click go 2.Click on My Account dropdown button 3.Verify login/Signup popup displayed or not	www.bookonlineticketz.in/	Login/Signup popup should display	Working as expected	Pass		N		Angelyn Sweetly I
HomePage_TC_002	UI	Home Page	Verify the UI elements in Login/Signup popup	1.Enter URL, and click go 2.Click on My Account dropdown button 3.Verify login/Signup popup with below UI elements a.email text box b.password text box c.Login button d.New customer? Create account link e.Last password? Recovery	www.bookonlineticketz.in/	Application should show below UI elements: a.email text box b.password text box c.Login button with orange colour d.New customer? Create account link e.Last password? Recovery password link	Working as expected	Fail	Steps are not clear to follow	Y	BUG-234	Afreen Minu Fahima K
HomePage_TC_003	Functional	Home page	Verify user is able to log into application with valid credentials	1.Enter URL(http://shophencor.com/) and click go 2.Click on My Account dropdown button 3.Enter Valid username/email in Email text box 4.Enter valid password in password text box	Username: chalam@gmail.com password: Testing023	User should navigate to user account homepage	Working as expected	Pass		N		Angelyn Sweetly I
LoginPage_TC_004	Functional	Login page	Verify user is able to log into application with invalid credentials	1.Enter URL(http://shophencor.com/) and click go 2.Click on My Account dropdown button 3.Enter Invalid username/email in Email text box 4.Enter valid password in password text box	Username: chalam@gmail.com password: Testing023	Application should show 'Incorrect email or password' validation message	Working as expected	Pass		N		Dhanushya N V
LoginPage_TC_005	Functional	Login page	Verify user is able to log into application with invalid credentials	1.Enter URL(http://shophencor.com/) and click go 2.Click on My Account dropdown button 3.Enter Valid username/email in Email text box 4.Enter Invalid password in password text box	Username: chalam@gmail.com password: Testing02367886788678876	Application should show 'Incorrect email or password' validation message	Working as expected	Pass		N		Afreen Minu Fahima K
LoginPage_TC_006	Functional	Login page	Verify user is able to log into application with invalid credentials	1.Enter URL(http://shophencor.com/) and click go 2.Click on My Account dropdown button 3.Enter Invalid username/email in Email text box 4.Enter Invalid password in password text box	Username: chalam@gmail.com password: Testing02367886788678876	Application should show 'Incorrect email or password' validation message	Working as expected	Pass		N		Ilamathi M
Booking_TC_007	Functional	Booking	Verify on filling train details like From station, To station, Departure date, list of available trains are displayed	2. Click on my Account Dropdown button 3. Enter the boarding Station 4. Enter the destination Station 5. Click the button	1. From: Mysore 2. To: Goa	Application should show the boarding and destination details.	Working as expected	Pass		N		Angelyn Sweetly I
Booking_TC_008	Functional	Booking	Verify that users can search for trains by name, from to station for checking their status and timings	2. Click on my Account Dropdown button 3. Enter the boarding Station 4. Enter the destination Station 5. Click the button	1. From: Mysore 2. To: Goa 3. Train: Mysore Express	User filled the details about the boarding and destination details and with the train name	Working as expected	Pass		N		Dhanushya N V
Booking_TC_009	UI	Booking	Verify that users can search for trains by name, from to station for checking their status and timings	2. Click on my Account Dropdown button 3. Enter the boarding Station 4. Enter the destination Station 5. Click the button	1. From: Mysore 2. To: Goa 3. Train: Chennai Express	show the following details: User filled the details about the boarding and destination details and with the train name	Working as expected	Fail	of the Train is	Y	BUG-345	Ilamathi M
Booking_TC_010	Functional	Booking	Verify that search results have train details, timings and availability.	1. Enter url and click go 2. Click on my Account Dropdown button 3. Enter the boarding Station 4. Enter the destination Station 5. Click the button	1. From: Mysore 2. To: Goa 3. Train: Chennai Express 4. Time: 12:00 AM	Application should show below UI elements: a.From text box b.Destination text box c.Train name: Mysore Express d.Time: 12:00 AM	Working as expected	Pass		N		Angelyn Sweetly I

[illegible][illegible]

Test case ID	Feature Type	Component	Test Scenario	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Comments	TC for Automation(Y/N)	BUG ID	Executed By
Payment_TC_020	Functional	Payment	Verify by trying payment from different types of payment mode.	1. Enter URL and click go 2. Click on my Account dropdown button 3. Enter the boarding Station 4. Enter the destination Station 5. Select the seats 6. Click on login button	1. Enter URL and click go 2. Payment : Online 3. Name : XXX 4. Age 30 5. Mobile : 9876543210	Application should show below UI elements: a. name text box b. age text box c. mobile d. Seat text box e. Online payment	Working as expected	Pass		N		Afreen Minu Fahima K
PassengerDetails_TC_021	Functional	Passenger Details	Verify error message is displayed when user enters special character in from and to field.	1. Enter URL and click go 2. Click on My Account dropdown button 3. Enter Invalid username in text box 4. Enter Invalid password in password text box 5. Click on login button	1. Name: \$\$\$\$ 2. Age: 20 3. Mobile: 986034229	Application should show 'Incorrect name or password' validation message.	Working as expected	Fail	Name is written with Special characters	Y	BUG-872	Charushya N V
TTE_TC_022	Functional	TTE	Verify TTE is able to see the LoginSignup popup when user clicked on My account button	1. Enter URL and click go 2. Click on Account dropdown button 3. Verify loginSignup	Id Steve password: Telogin	LoginSignup popup should display	Working as expected	Pass		N		Ilamathi M
TTE_TC_023	UI	TTE	Verify TTE is able to see the LoginSignup popup when user clicked on My account button	1. Enter URL and click go 2. Click on Account dropdown button 3. Verify loginSignup popup displayed or not	Id Userid() password: Telogin	Application should show 'Incorrect name or password' validation message.	Working as expected	Fail	When the TTE should login in TTE login space. No User should access TTE	Y	BUG-756	Ilamathi M
Booking_TC_024	UI	Booking	Verify on filling train details like From station, To station, Departure date, list of available trains are displayed	1. Enter URL and click go 2. Click on my Account dropdown button 3. Enter the boarding Station 4. Enter the destination Station 5. Select the seats	1. From 2. To : Goa 3. Train: Chennai Express 4. Time: 12:00 AM 5. Available Seats: 5	Application should show 'Incorrect name or password' validation message.	Working as expected	Fail	the user tries to book the ticket without choosing the boarding station	Y	BUG-642	Angelyn Sweetly I
Payment_TC_025	UI	Payment	Verify payment should get rejected when user enter wrong credentials during payment process.	1. Enter URL and click go 2. Click on my Account dropdown button 3. Enter the boarding Station 4. Enter the destination Station 5. Select the seats	1. Enter URL and click go 2. Payment : Online 3. Name : XXX 4. Age 30 5. Mobile : 9876543210	Application should show 'Incorrect name or password' validation message.	Working as expected	Fail		Y	BUG-124	Charushya N V
Test case ID	Feature Type	Component	Test Scenario	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Comments	TC for Automation(Y/N)	BUG ID	Executed By
TTE_TC_026	Functional	TTE	Verify TTE can view the details of bookings when scanning the QR code	1. Enter URL and click go 2. Click on my Account dropdown button 3. Enter the boarding Station 4. Enter the destination Station 5. Select the seats	1. Enter URL and click go 2. Payment : Online 3. Name : XXX 4. Age 30 5. Mobile : 9876543210	TTE can view the booking details	Working as expected	Pass		N		Charushya N V
BookingDetails_TC_027	Functional	Booking Details	Verify user should not be able to purchase ticket if he is not login to application.	1. Enter URL and click go 2. Click on my Account dropdown button 3. Verify loginSignup popup with below UI elements: a. username text box b. password text box c. Login button	Username: chalam@gmail.com password: Testing123	Application should show 'Incorrect email or password' validation message.	Working as expected	Fail		Y	BUG- 907	Afreen Minu Fahima K
LoginPage_TC_028	Functional	Train Tracking	Verify whether the user can track the live location the train	1. Enter URL and click go 2. Click on My Account dropdown button 3. Verify loginSignup popup with below UI elements: the user can able to view the live location	Live Location of the train: Hyderabad	User can able to view the live location of the train	Working as expected	pass		N		Ilamathi M
TrainTracking_TC_029	Functional	Train Tracking	Verify whether the user can track the live location the train with the update periodically	1. Enter URL and click go 2. Click on My Account dropdown button 3. Verify loginSignup popup with below UI elements: the user can able to view the live location	Current Location of the train : Vijaywada	user can track the live location the train with the update periodically	Working as expected	pass		N		Afreen Minu Fahima K
TrainTracking_TC_030	UI	Train Tracking	Verify whether the user can track the live location the train	1. Enter URL and click go 2. Click on My Account dropdown button 3. Verify loginSignup popup with below UI elements: the user can able to view the live location	Live Location of the train: Pune	User can able to view correct live location of the train	Working as expected	fail	the shown live location of the train is wrong	Y	BUG- 872	Angelyn Sweetly I

8.2 User Acceptance Testing

1. Purpose of Document

The purpose of this document is to briefly explain the test coverage and open issues of the [Smart Solutions for Railways] project at the time of the release to User Acceptance Testing (UAT).

2. Defect Analysis

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

Resolution	Severity 1	Severity 2	Severity 3	Severity4	Subtotal
By Design	5	2	3	1	11
Duplicate	1	1	0	0	2
External	2	1	0	0	3
Fixed	9	4	5	2	20
Not Reproduced	0	0	1	0	1
Skipped	0	1	0	2	3
Won't Fix	1	0	1	0	2
Totals	18	9	10	5	42

The defect analysis was resolved by,

1. Reviewing the code and establishing checkpoints.
2. Debugging window.
3. By working in pairs and conducting team window.
4. By developing action plans to cope with specific issues.
5. Defect resolution process.
6. Prioritize and resolving defect.
7. Validating the corrective action presented.

3. Test Case Analysis

This report shows the number of test cases that have passed, failed, and untested

Section	Total Cases	Not Tested	Fail	Pass
Home page	3	0	0	3
Login page	4	0	0	4
Bookings	10	0	0	10
Passenger Details	6	0	0	6
TTE	3	0	0	3
Train Tracking	2	0	0	2
Payment	2	0	0	2

9. RESULTS

9.1 Performance Metrics

Software quality is a measurement of something intangible, “how good” a software product really is. Some of the aspects of software quality taken are

- a. Scalability
- b. Speed
- c. Stability
- d. Reliability
- e. Security
- f. Maintainability and code quality

LOAD TEST

Scenario Name	Load Test – Smart Solutions for Railways Project
Scenario Type	Load Test – Duration 1 hour
Scenario Objective	To Simulate the peak load and to monitor the performance of the Website
Steps	The online load will be maintained at steady state
Entry Criteria	All the monitors are in ready state
Exit Criteria	Response met the criteria and test completion report is agreed

STRESS TEST

Scenario Name	Stress Test - Smart Solutions for Railways Project
Scenario Type	Stress Test
Scenario Objective	Objective is to verify that the application can handle the projected growth and to discover the breaking point
Steps	Ramp up to 150% of peak volume and continuously increase load until breaking point
Entry Criteria	All the monitors are in place Test Data is set up Peak load test completed successfully
Exit Criteria	Test completion report is agreed upon as per expectation

ENDURANCE / SOAK TEST:

Scenario Name	Soak Test – Smart Solutions for Railways Project
Scenario Type	Endurance – Duration 8 hours
Scenario Objective	To discover memory issues and bottlenecks that might occur under daily usage of the application
Steps	Steady state is maintained for 8 hours with half of the peak load
Entry Criteria	All the monitors are in place Test Data is set up Peak load test completed successfully
Exit Criteria	Test completion report is agreed upon as per expectation

10. 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.

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 when the Ticket Collector scans the QR Code.

12. Future Scope

- One of the most significant benefits of an online reservation system is that they are always open for business and can accept bookings 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 prospects research 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 and we 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 online ticket booking platform industry.

13. APPENDIX

Source Code

Python code: Refer section 7 - Coding and Solutioning

Node - Red Flows (json format) :

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```
{ };\nmsg.payload = signup;\nreturn
msg;,"outputs":1,"noerr":0,"initialize":"","finalize":"","libs":[,"x":360,"y":540,"wires":[["7574e8aac64ecb26","44f5a8f98a8f4c44","707b2b2572d7d441"]]],{"id":"46fc2bf4889ccdf0","type":"comment","z":"f52cc72524bafd3a","name":"Confirmation of Sign up","info":"","x":620,"y":540,"wires":[]},{ "id":"7d458d15a4155be9","type":"ui_text","z":"f52cc72524bafd3a","group":"37a267ed1a458278","order":8,"width":14,"height":1,"name":"SignUp Feedback","label":"","format":"{{ msg.payload }}","layout":"row-spread","className":"","x":990,"y":620,"wires":[]},{ "id":"7574e8aac64ecb26","type":"function","z":"f52cc72524bafd3a","name":"Confirmation Message","func":"msg.payload = `Your Account is successfully created`;\\nreturn msg;","outputs":1,"noerr":0,"initialize":"","finalize":"","libs":[,"x":640,"y":620,"wires":[["7d458d15a4155be9"]]],{"id":"d1370f5ee2f35dad","type":"comment","z":"f52cc72524bafd3a","name":"Login page","info":"","x":130,"y":40,"wires":[]},{ "id":"cefa9967356fb848","type":"comment","z":"f52cc72524bafd3a","name":"About","info":"","x":90,"y":760,"wires":[]},{ "id":"8465dcef34557fe1","type":"ui_form","z":"f52cc72524bafd3a","name":"","label":"","group":"b944bd655d2bb705","order":5,"width":12,"height":1,"options":[{"label":"username","value":"username","type":"text","required":true,"rows":null},{ "label":"password","value":"password","type":"text","required":true,"rows":null}], "formValue":{"username":"","password":""},"payload":"","submit":"Login","cancel":"","topic":"payload","topicType":"msg","splitLayout":"","className":"","x":110,"y":140,"wires":[["f8d861a74351f205"]]],{"id":"f8d861a74351f205","type":"delay","z":"f52cc72524bafd3a","name":"","pauseType":"delay","timeout":"100","timeoutUnits":"milliseconds","rate":"1","nbRateUnits":"1","rateUnits":"second","randomFirst":"1","randomLast":"5","randomUnits":"seconds","drop":false,"allowrate":false,"outputs":1,"x":310,"y":140,"wires":[["33dc8e14ded24e18"]]],{"id":"33dc8e14ded24e18","type":"function","z":"f52cc72524bafd3a","name":"Login Checker","func":"var userName = [\"user1\\\", \"user2\\\", \"user3\\\", \"user4\\\"];\nvar userCode = [\"123\\\", \"456\\\", \"789\\\", \"012\\\"];\nvar name;\nvar pass;\nvar msg1,msg2;\n\\n\\nname=msg.payload.username;\n\\npass = msg.payload.password;\n\\n\\nmsg1=userName.includes(name);\n\\nmsg2=userCode.includes(pass);\n\\n\\nif(msg1==true && msg2==true)\\n{\\n  msg = {payload:2};\\n}\\nelse\\n{\\n  msg = {payload:0};\\n}\\nreturn msg;\\n","outputs":1,"noerr":0,"initialize":"","finalize":"","libs":[,"x":500,"y":140,"wires":[["ad9a0f7ca9f8cd3e","3fb941c5011005c9","72fd7a4d5406998a","52450b1804804a6d"]]],{"id":"3b6652d124ebc609","type":"ui_text","z":"f52cc72524bafd3a","group":"b944bd655d2bb705","order":8,"width":12,"height":1,"name":"Login feedback","label":"","format":"{{ msg.payload }}","layout":"row-spread","className":"","x":1080,"y":260,"wires":[]},{ "id":"8645d955a9d6c18e","type":"template","z":"f52cc72524bafd3a","name":"CSS","field":"payload","fieldType":"msg","format":"css","syntax":"mustache","template":"body {\\n  background-color: #141414;\\n  background-image:url('data:image/svg+xml;base64,PHN2ZyB4bWxucxz0naHR0cDovL3d3dy53My5vcmcvMjAwMC9zdmcnIHdpZHRoPScxMDAlJyBoZWlnaHQ9JzEyMCC+CGk8ZGVmcz4KCQk8cGF0dGVybiBwYXR0ZXJuVW5pdHM9J3VzZXJtcGFjZU9uVXNIJyBpZD0nYycgd2lkdGg9JzYwJyBoZWlnaHQ9JzEyMCCgeD0nMCCgeT0nMCCgdmlld0JveD0nMCAwIDUgMTAnPgoJCQk8cGF0aCBmaWxsLW9wYWNpdHk9JzAnIHN0cm9rZT0nIzI5MjkyOScgc3Ryb2tLXdpZHRoPScwLjA5JyBkPSdNLTIsMUw3LDEwTS0yLDZMNywxNU0tMiwtNEw3LDUnLz4KCQk8L3BhdHRlcm4+CGkJPBhdHRlcm4gcGF0dGVyblVuaXRzPSd1c2VyU3BhY2VPblVzZScg"

```

aWQ9J2MyJyB3aWR0aD0nNjAnIGhlaWdodD0nMTIwJyB4PScxMDAlJyB5PScwJyB2aWV3Qm94PScwIDAgNSAxMCc+CgkJC
TxwYXRoIGZpbGwtb3BhY2l0eT0nMCcgc3Ryb2t1PScjMjkyOTI5JyBzdHJva2Utd2lkdGg9JzAuMDknIGQ9J003LDFMLTIsMTBN
Nyw2TC0yLDElTTcsLTRMLTIsNScvPgoJCTwvcGF0dGVybj4KCTwvZGVmcz4KCTxyZWN0IHdpZHRoPSclMCUnIGhlaWdod
D0nMTAwJSgcZmlsbD0ndXJsKCNjKScvPgoJPHJlY3QgeD0nNTAlJyB3aWR0aD0nNTAlJyBoZWlnaHQ9JzEwMCUnIGZpbGw9
J3VyYyCgJYzIpJy8+Cjwvc3ZnPg==');\n\n margin:0; padding:0;\n overflow-x:hidden;\n height:100%; \n font-family: 'Lato',
Helvetica, arial, sans-serif;\n font-weight: 300;\n font-size: 20px;\n line-height: 1.45;\n color: #eee;\n color:
rgba(255,255,255,.85);\n}\n#container { \n padding-top: 50px;\n}\n#content {\n max-width: 43em;\n padding:10px;\n margin:
0 auto;\n}\n\nh1 {\n font-size: 4.8em;\n font-weight: 100;\n text-transform: uppercase;\n margin: 0;\n}\n\nh3 {\n font-size:
2.4em;\n font-weight: 300;\n line-height: 1.5;\n}\n\np, li {\n font-size: 1.7em;\n}\n\na {\n font-weight: 700;\n text-decoration:
none;\n color: #fff;\n}\n\na:hover {\n text-decoration: underline;\n}\n\n#pleft {\n max-width:20em;\n float:left;\n}\n\n#pright {\n
max-width:20em;\n float:left;\n}\n\nul {\n clear:both;\n}\n\n\nhtml { font-size: 62.5%; }\nbody { font-size: 1em; }\n\n/* PYRAMID
CODE */\n.stage {\n -webkit-transform:scale(1.85);\n transform:scale(0.85);\n float:right;\n margin-right:120px;\n margin-
top:30px;\n width:0px; height:0px;\n\n\n position:relative; \n -webkit-perspective:1200px;\n -webkit-perspective-origin:50%
50%; \n perspective:1200px;\n perspective-origin:50% 50%; \n}\n\n.pyramid3d {\n position:relative;\n width:150px;\n
height:150px;\n\n\n -webkit-transform-style: preserve-3d;\n transform-style: preserve-3d;\n -webkit-transform: rotateX(75deg)
rotate(65deg);\n transform: rotateX(75deg) rotate(65deg);\n -webkit-animation: turnPyramid 10s linear infinite;\n animation:
turnPyramid 10s linear infinite;\n}\n\n.triangle {\n -webkit-transform-style:preserve-3d;\n transform-style:preserve-3d;\n width:0;\n
height:0;\n background:none;\n}\n\n.triangle:before{\n content:'';\n position: absolute;\n height: 0; width: 0;\n border-style:
solid;\n border-width: 176px 75px 0 75px;\n}\n\n.side1 { -webkit-transform: translateX(0) rotateY(115.2deg) rotateZ(90deg); transform:
translateX(0) rotateY(115.2deg) rotateZ(90deg); }\n\n.side2 { -webkit-transform: translateX(150px) rotateZ(90deg) rotateX(64.8deg);
transform: translateX(150px) rotateZ(90deg) rotateX(64.8deg); }\n\n.side3 { -webkit-transform: translateZ(0) rotateX(64.8deg);
transform: translateZ(0) rotateX(64.8deg); }\n\n.side4 { -webkit-transform: translateY(150px) rotateX(115.2deg); transform:
translateY(150px) rotateX(115.2deg); }\n\n.side1:before{ border-color: rgba(115, 115, 0, 0.3) transparent transparent transparent;
}\n\n.side2:before{ border-color: rgba(20, 90, 225, 0.3) transparent transparent transparent; }\n\n.side3:before{ border-color: rgba(255,
0, 0, 0.3) transparent transparent transparent; }\n\n.side4:before{ border-color: rgba(0, 255, 255, 0.3) transparent transparent
transparent; }\n\n\n\n@-webkit-keyframes turnPyramid { 100% { -webkit-transform: rotateX(75deg) rotate(425deg); } }\n\n@keyframes
turnPyramid { 100% { transform: rotateX(75deg) rotate(425deg); } }\n\n\n\n@media (max-width: 300px) {\n\n\n\nhtml { font-size: 70%; }\n\n
.stage { -webkit-transform:scale(0.05); transform:scale(0.05); }\n\n\n\n@media (max-width: 440px) {\n\n\n\nh1 { line-height:55px; }\n\n
@media (max-width: 460px) {\n\n\n\n.stage { position:absolute; top:25px; left:50%; margin-left:-45px; }\n\n\nh1 { margin-top:50px;
text-align:center; }\n\n
@media (max-width:600px) {\n\n\n\n.stage { -webkit-transform:scale(0.55); transform:scale(0.55); margin-
right:60px; }\n\n
@media (min-width: 600px) {\n\n\n\nhtml { font-size: 80%; }\n\n\n.stage { -webkit-transform:scale(0.68);
transform:scale(0.68); margin-right:80px; }\n\n
@media (min-width: 880px) {\n\n\n\nhtml { font-size: 120%; }\n\n\np, li { font-size: 1em;
}\n\np#pright { margin-left:3em; }\n\n\n.stage { -webkit-transform:scale(0.85); transform:scale(0.85); margin-right:120px;


```

    }n},"output":"str","x":390,"y":860,"wires":[[]]},{ "id":"34a75e3599535943","type":"ui_template","z":"f52cc72524bafd3a","group":"
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<div id=\"about\">\n    <h1>\n        <div style=float:left;margin-bottom:20px;>\n            Book Easy\n        </div>\n        <div
class=\"stage\">\n            <div class=\"pyramid3d\">\n                <div class=\"triangle side1\"></div>\n                <div class=\"triangle
side2\"></div>\n                <div class=\"triangle side3\"></div>\n                <div class=\"triangle side4\"></div>\n            </div>\n        </h1>\n        <h3 style='clear:both' class=\"subhead\">\n            <a
href=\"https://plus.google.com/108495471566196018473/posts\">Book Easy App</a> helps you to book the ticket at your comfort
zone and place.\n        </h3>\n        <p>\n            Our App breaks the usual way to book the train ticket.\n        </p><br>\n        <p><b>
Beneficts of using our App </b></p>\n        <ul>\n            <li>Online Ticket Booking</li>\n            <li>Automated Ticket
verification</li>\n            <li>Work Load reduccion for user</li>\n        </ul>\n    </div>\n</div>","storeOutMessages":true,"fwdInMessages":true,"resendOnRefresh":true,"templateScope":"local","className":"","x"
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msg;","outputs":1,"noerr":0,"initialize":"","finalize":"","libs":[],"x":800,"y":260,"wires":[["3b6652d124ebc609"]],{ "id":"72fd7a4d54
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a==5)\n{\n  msg.payload = 0\n}\nelse{\n  msg.payload = 1\n}\nreturn  
msg;", "outputs": 1, "noerr": 0, "initialize": "", "finalize": "", "libs": [], "x": 330, "y": 780, "wires": [[ "5f62828e1a9c1e8b" ] ] ], { "id": "6ba6b7b21a  
4beed0", "type": "function", "z": "f71bd8f6e16cc47c", "name": "remove booked seat", "func": "var s = global.get('s')\nvar a =  
global.get('a') \n/**\n* @param {any} x\n*/\nfunction rem(x){\n  for (let i=0; i<a.length;  
i++){ \n    if(a[i]==x){ \n      a.splice(i,1)\n    }\n  }\n  if(s == 1){ \n    global.set('s',s)\n    rem(s)\n  }\n  else if(s ==
```

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2){\nglobal.set('s1',s)\nrem(s)\n}\nelse  if(s==3){\nglobal.set('s3',s)\nrem(s)\n}\nelse  if(s==4){\nglobal.set('s4',s)\nrem(s)\n}\nelse  if(s
== 5){\nglobal.set('s5',s)\nrem(s)\n\n} return
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e829398ae"]]],{"id":"bd1f5e2e829398ae","type":"function","z":"f71bd8f6e16cc47c","name":"show remaining tickets","func":"var a
= global.get('a')\nvar s = []\nfor(let i=0; i<=a.length; i++){  \n  s.push(a[i])\n}\nif(s.length == 1){\nmsg.options=[{"No seats
Available"}:0]}\n}\nelse{\nmsg.options= s\n}\nmsg.payload = s\nreturn
msg;,"outputs":1,"noerr":0,"initialize":"","finalize":"","libs":[,"x":560,"y":960,"wires":[["0ac7b19190d56dee"]]],{"id":"d97269d73f
19ce48","type":"function","z":"f71bd8f6e16cc47c","name":"a var global
def","func":"global.set('s1',0)\nglobal.set('s2',0)\nglobal.set('s3',0)\nglobal.set('s4',0)\nvar
a1=[1,2,3,4,5]\nglobal.set('a',a1)\nmsg.payload = global.get('a')\nreturn
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vt":"str"}],{"t":"eq","v":"1","vt":"str"}],checkall":"true","repair":false,"outputs":2,"x":530,"y":780,"wires":[["dce0f651e6036656"],["
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(3600000*offset));\nvar n=newDate.toISOString()\nvar date=n.slice(0,10)\nvar time=n.slice(11,19)\nvar d1=date+' '+time\nvar final =
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```

GITHUB LINK :

<https://github.com/IBM-EPBL/IBM-Project-31864-1660205740>