NALAIYA THIRAN - IBM PROJECT REPORT

(19EC406T - Professional Readiness for Innovation, Employability and Entrepreneurship)

ON

SMART SOLUTIONS FOR RAILWAYS

TEAM ID: PNT2022TMID23442
Submitted by

BALAKRISHNAN V	**(113219041016)**
ABISHEK KUMAR S	**(113219041003)**
SRINATH T	**(113219041115)**
MUKESH R	**(113219041070)**

BACHELOR OF ENGINEERING
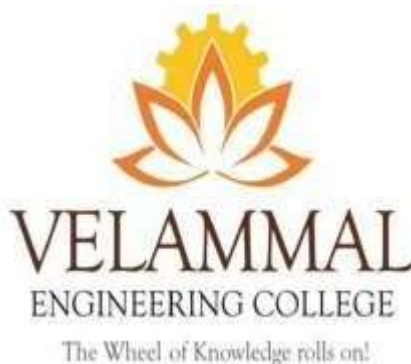
IN

ELECTRONICS AND COMMUNICATION

VELAMMAL ENGINEERING COLLEGE,CHENNAI-66.

(An Autonomous Institution,Affiliated to Anna University, Chennai)

2022-2023

VELAMMAL ENGINEERING COLLEGE
CHENNAI-66

(An Autonomous Institution,Affiliated to Anna University, Chennai)

BONAFIDE CERTIFICATE

Certified that this project report, "**SMART SOLUTIONS FOR RAILWAYS**" is the bonafide work of "**BALAKRISHNAN V(113219041016), MUKESH R(113219041070), ABISHEK KUMAR S(113219041003), SRINATH T(113219041115**)" who carried out the project work under my supervision and industry mentor.

SIGNATURE   SIGNATURE

Dr. S. MARY JOANS   **Mrs. DOLLY IRENE J**

PROFESSOR &   **MENTOR**
HEAD OF THE DEPARTMENT   **ASSISTANT PROFESSOR**
Department of Electronics &   Department of Electronics
Communication Engineering   Communication Engineering
Velammal Engineering College   Velammal Engineering
College   College
Ambattur-Redhills road,   Ambattur-Redhills road,
Chennai -66.   Chennai-66.

CERTIFICATE OF EVALUATION

College Name : Velammal Engineering College

Department : Electronics & Communication Engineering

Semester : VII Semester

SI.NO	TEAM MEMBERS	TITLE OF THE PROJECT	MENTOR
1.	BALAKRISHNAN V (113219041016)	SMART SOLUTIONS FOR RAILWAYS	Mrs.DOLLY IRENE J ASSISTANT PROFESSOR (ECE)
2.	ABISHEK KUMAR S (113219041003)		
3.	SRINATH T (113219041115)		
4.	MUKESH R (113219041070)		

The report of the project work submitted by the above students in the partial fulfillment for the award of Bachelor of Engineering Degree in **ELECTRONICS AND COMMUNICATION ENGINEERING** of Anna University, Chennai was evaluated and confirmed to be the report of the work done by the above students and then evaluated.

Submitted for Internal Evaluation held on____/____/2022.

MENTOR   **EVALUATOR**

TABLE OF CONTENTS

CHAPTER 1
INTRODUCTION

1.1 PROJECT OVERVIEW

The SMART SOLUTION FOR RAILWAY project aims to improve the facility to use the easiest way to reserve a ticket through online with the help of QR code scanner.During this project we work on IOT devices and we can gain knowledge about how to work with Watson IOT Platform. Connecting and exchanging the sensor data. Also IBM Cloudant DB is also used. Scan the QR code and retrieve the user details about the reservation of the ticket. Generating the user details in the database connecting to the xampp server for the web page. Storing the data in the Cloudant DB. With the QR code we can generate the required data.

1.2 PURPOSE

- ➢ In our project, using the web application by writing a code in html css and js the user details can be created.
- ➢ Once the details are created it gets stored in the database.
- ➢ Once the user clicks the submit button,the QR code is generated and the unique Id is generated along with the details with the unique id is stored in the Cloudant DB.
- ➢ In python code, a ticket collector can scan the QR code and the unique is checked along with the id the passenger provided to check the details of the user.
- ➢ Also the live location of the train is tracked by using GPS tracker.

CHAPTER 2

LITERATURE SURVEY

2.1 EXISTING PROBLEMS

Author	Title	source	Findings
Naveen Bhargav et al. (2016)	Automatic Fault Detection of Railway Track System Based on PLC (ADOR TAST)	International Journal of Recent Research Aspects	The sensor is used to detect defect in the train track and the ultraviolet sensor is used to detect the obstruction in front of the train.
B. Siva Rama Krishna et al. (2017)	Railway track fault detection system using IR sensors and Bluetooth technology	Asian Journal of Applied Science and Technology (AJAST)	In the event of any defect on the track it will detect track defect using IR sensors and then it sends a message to the android phone using a Bluetooth module.
Mansi R. Sarwan et al. (2018)	Self-Powered For Railway Track	IOSR Journal of Engineering (IOSR JEN)	This has resulted in a rapid increase in surveillance of

	Monitoring Using IoT		systems, buildings, vehicles, and machines using sensors.
S. Mishra, A. Shrivastava and B. Shrivastav (2019)	A Smart Fault Detection System For Indian Railways	International Journal of Scientific & Technology Research	The device built will be attached to a train engine and contains a sensor that can detect a few meters cracks and as soon as any cracks are found the train driver will receive a signal to install emergency brakes and the authorities will be notified of the correct location of the fault.

2.2 PROBLEM STATEMENT AND DEFINITIONS

The problem that have been occurred in using the application defines the problem statement. The problem statements include Engagement of dedicated staff/window for Pass/PTO and ticketing, Loss of working time of staff requiring pass, Wastage of lot of Paper, Availability of Pass/PTO and ticketing(in night, away from HQ, for the families).

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	Traveller	Book ticket	Ticket has not been provided	There is no unique id given and datas are not stored Properly	Unhappy
PS-2	Passenger	Get my ticketand the location of a train arriving	Couldn't track the location	There is no proper scheme provided	Helpless

CHAPTER 3

IDEATION AND PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS

3.2 IDEATION AND BRAINSTORMING

Brainstorm & idea prioritization

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

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

Before you collaborate

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

10 minutes

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

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

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

Open article →

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 might we book tickets using QR Code in railway ticket booking system?

PROBLEM
How might we get the details of the passengers?

PROBLEM
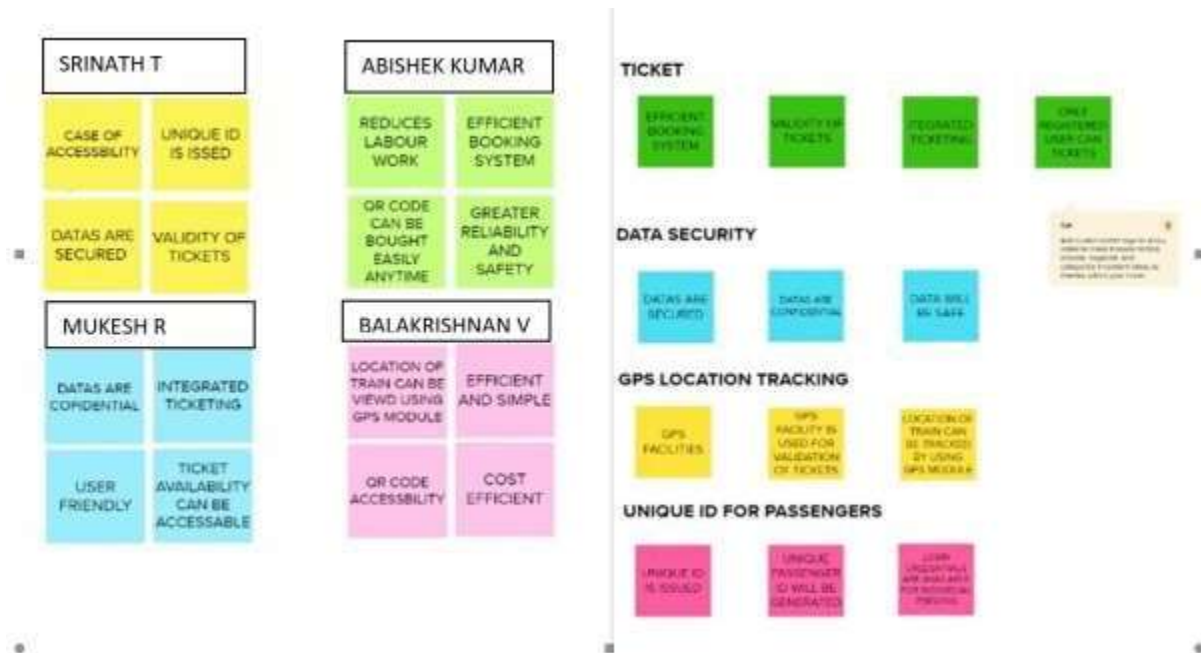How might we track the location?

PROBLEM
How might we get the unique ID?

Key rules of brainstorming
To run an smooth and productive session

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

3.3 PROPOSED SOLUTION

S .No	Parameter	Description
1.	Problem Statement (Problem to be solved)	On-site ticket booking may take lot of time and there is a issue of loosing their manual tickets. Even in online booking we should have a copy of ticket as softcopy, in case if that ticket gets erased or lost it will be sometimes difficult to retrieve it. Here we need to show the printed copy or soft copy of tickets and ID card proofs to Ticket checker.
2.	Idea / Solution description	Book tickets using QR Code in railway ticket booking system. We get the details of the passengers. We track the current location of the particular train. We provide unique ID for passengers to secure their information and we will have chatbot for

		customer queries.
3.	Novelty / Uniqueness	➤ Efficient booking system, verifying validity of the ticket and only register user can book the tickets. ➤ Each passenger will be provided by giving a unique ID to them during first login so that their data will be stored and processed securely. ➤ GPS tracking facility will be provided to track the current location ➤ We provide chatbot for customers queries and that will be solved as soon as possible.
4.	Social Impact / Customer Satisfaction	➤ Passenger data will be more securely maintained ➤ Prefect way to reserve tickets ➤ User friendly environment ➤ Query section for customer
5.	Business Model (Revenue Model)	Using chat bot, we can contact user's ticket booking. The chat bot can give instructions to the users based on their location. It will store the customer's details and ticket orders in the database. The chat bot will send a notification to customers if the booking is confirmed. Chat bots can also help in collecting customer feedback.
6.	Scalability of the Solution	This model can be easily adopted among online users and it can be easily deployed. It can be used and accessed by everyone and it can handle the requests from the Customers

3.4 PROBLEM SOLUTION FIT

Project Title: Smart Solutions For Railways	Project Design Phase-I - Solution Fit Template	Team ID: PNT2022TMID23589

Define CS, fit into CC

1. CUSTOMER SEGMENT(S) `CS`

Passengers are the customers.

6. CUSTOMER CONSTRAINTS `CC`

1. Greater Reliability and Safety.
2. Advanced Analytics for Streamlined Operations.
3. Restructured and Optimized Passenger Experience.
4. Better Product Development in the Industry.

5. AVAILABLE SOLUTIONS `AS`

Earlier, there is no way for booking a ticket in online also people faced issue in tracking the location of the train thus in this project we are implementing the scheme that passengers can easily book the ticket by using qr code and also can track the location using GPS tracker.

Explore AS, differentiate

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

2. JOBS-TO-BE-DONE / PROBLEMS `J&P`

The passengers face several problems while booking their tickets like network and server issues.

Passengers can't find the location of the train or track the availability of the train.

9. PROBLEM ROOT CAUSE `RC`

The main reason for the problem that has occured for due to lack of technology earlier since passengers find it difficult to book the ticket and track the location of the train.

To overcome this problem we have introduced qr code and GPS tracker for booking the ticket and finding the location of the train.

7. BEHAVIOUR `BE`

Listen to the customer and providing genuine empathy for the problem regarded which is a direct approach.

Another method is by looking over the rating session we can easily find out how the customer gets issues while using the application this is an indirect approach.

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

Identify strong TR & EM

3. TRIGGERS `TR`

8. YOUR SOLUTION `SL`

8. CHANNELS of BEHAVIOR `CB`

1.1 ONLINE

1.1 OFFLINE

Identify strong TR & EM

---

4. EMOTIONS: BEFORE / AFTER `EM`

9

CHAPTER 4

REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENTS

FR.NO	FUNCTIONAL REQUIREMENTS	SUB REGISTRATION
FR-1	User Registration	Registration through Form
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	User QR code generation	QR code is generated
FR-4	GPS tracker	Location is tracked

4.2 NON FUNCTIONAL REQUIREMENTS

| FR.NO	NON FUNCTIONAL REQUIREMENTS	DESCRIPTION
NFR 1	USABILITY	Users can navigate easily
NFR 2	SECURITY	The details are secured in the database
NFR 3	RELIABILITY	Reliable to the users without any failure as it is not fixed to limited number of users
NFR 4	PERFORMANCE	User-friendly

NFR 5	AVAILABILITY	Available any time at the time of ease
NFR 6	SCALABILITY	Support the users with their needs in reserving ticket and tracking the location.

CHAPTER 5

# PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.
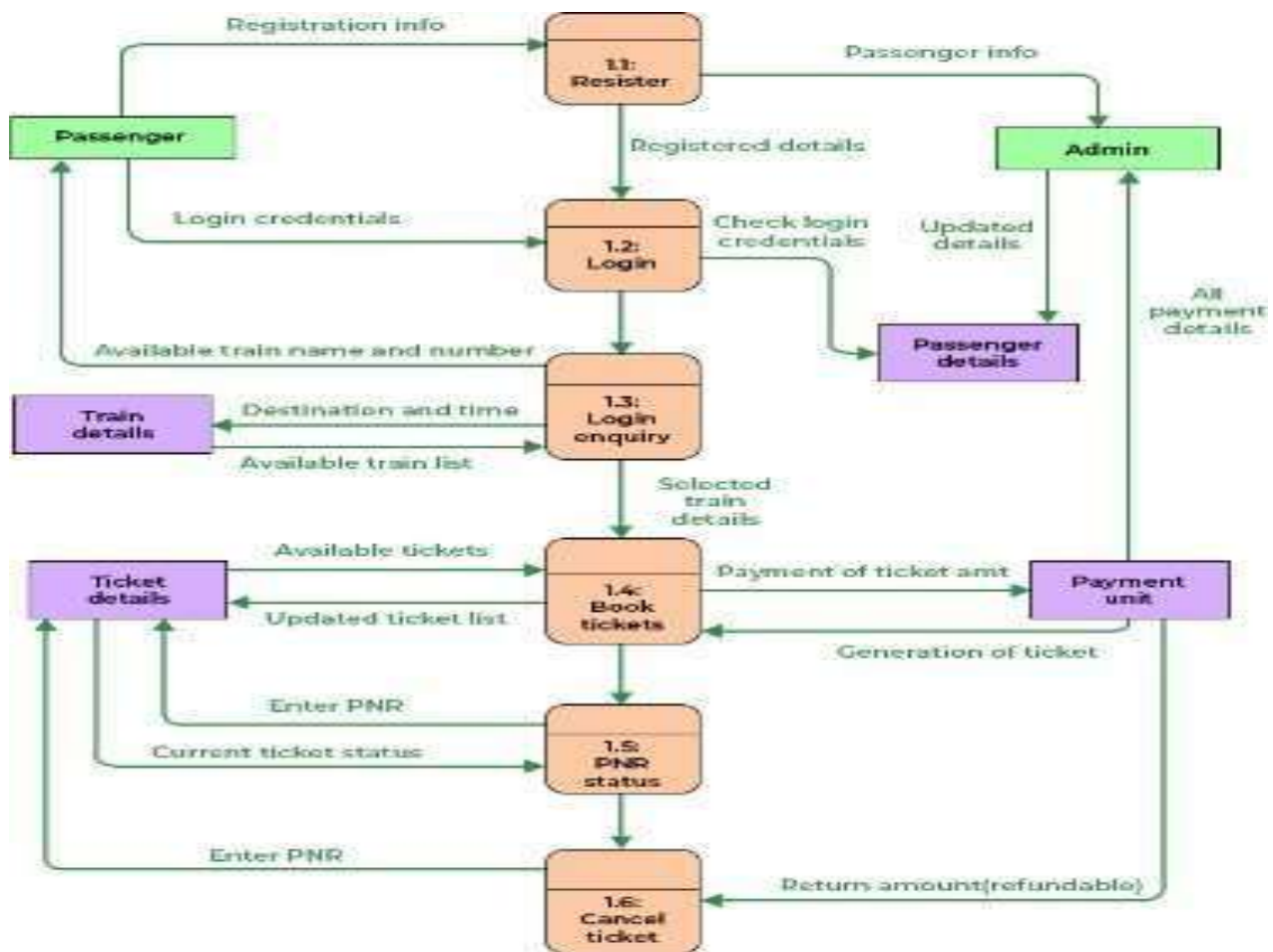
5.2 SOLUTION AND TECHNICAL ARCHITECTURE

Solution architecture is a complex process with many sub-processes that bridges the gap between business problems and technology solutions. Its goals are to:

● Find the best tech solution to solve existing business problems.

● Describe the structure, characteristics, behavior, and other aspects of the software to project stakeholders.

● Define features, development phases, and solution requirements.

● Provide specifications according to which the solution is defined, managed, and delivered.
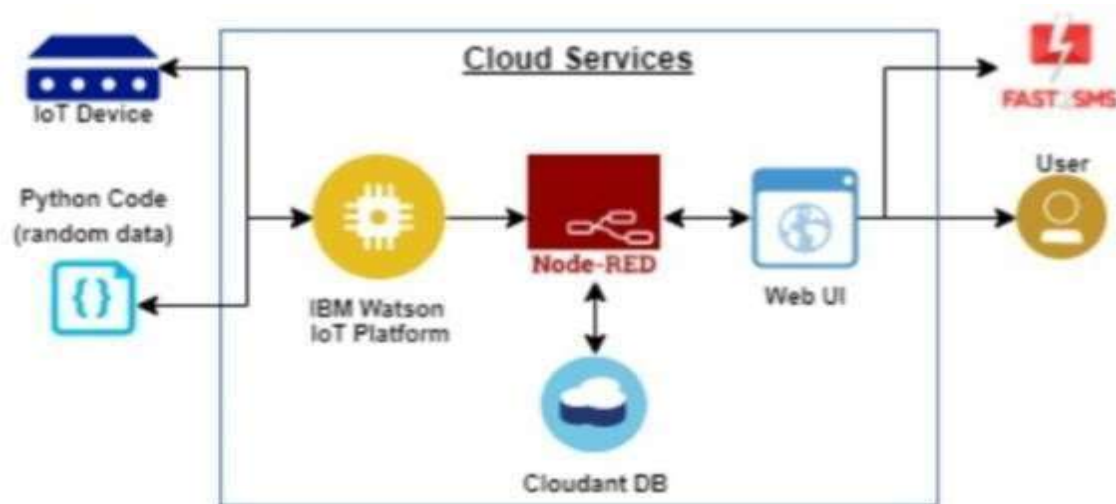
5.3 USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Reserving ticket	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
Customer (Mobile user)	Reserving ticket	USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint-1
Customer (Mobile user)	Reserving ticket	USN-3	As a user, I can register for the application and enter the details for reserving the ticket.	I can register & access the dashboard with Facebook Login	Low	Sprint-2
Customer (Mobile user)	Dashboard	Users	The details will be stored safely	I can access it using database	Medium	Sprint-3
Customer (Web user)	Reserving ticket	User	Enter the details and click submit button to book ticket	I can use the QR code which is been generated	High	Sprint-1
Customer Care Executive	Connecting the service provider	Customer	Connects with the service by logging in	Can get connected with the server	Medium	Sprint-3
Administrator	Provides the services	Admin	The data is given by the user	Can add or update the data provided by the user	High	Sprint-1

CHAPTER 6

PROJECT PLANNING AND SCHEDULING

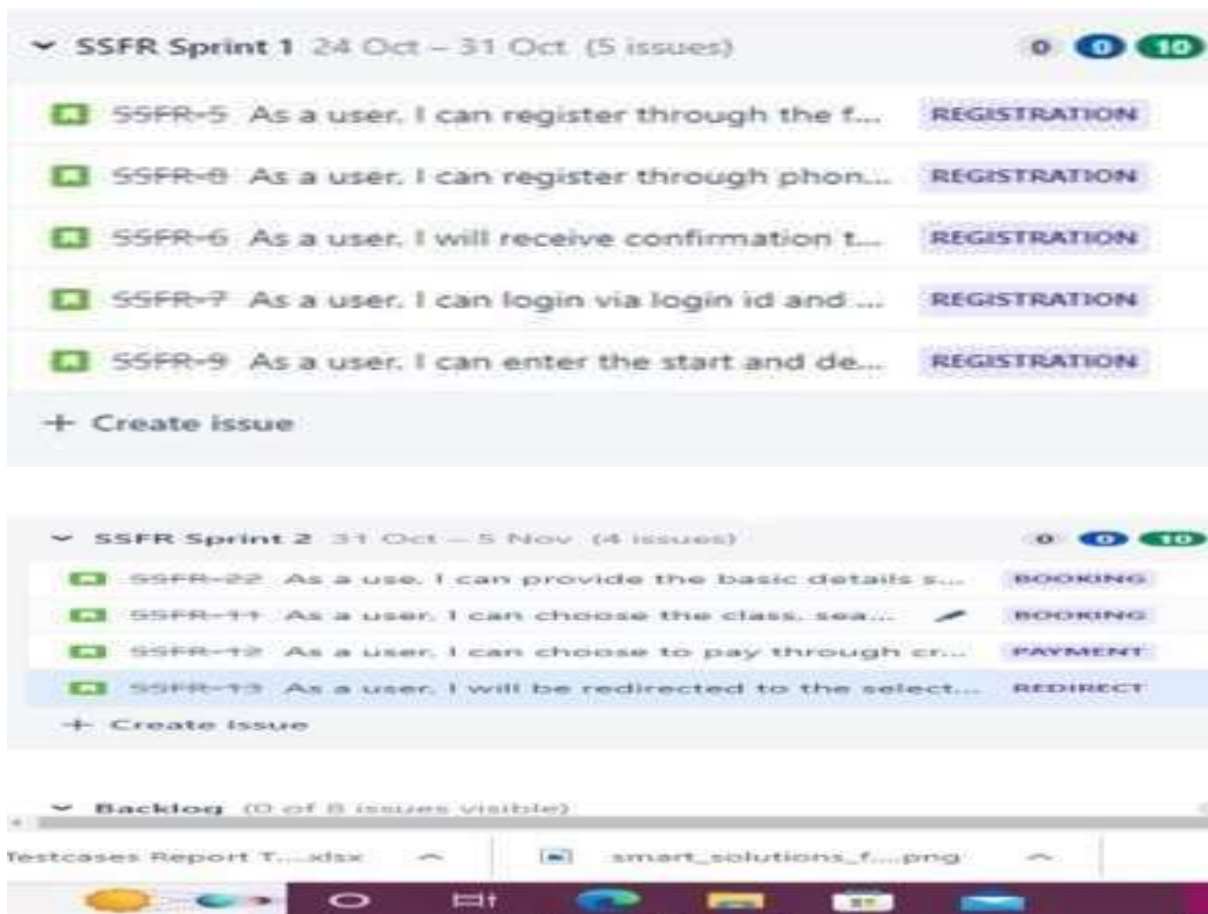## 6.1 SPRINT PLANNING AND ESTIMATION

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority
Sprint-1	Registration	USN-1	As a passenger, I want to create a login credentials so I can securely access myself service online account.	15	High
Sprint-1	Ticket Conformation	USN-2	As a passenger, I want to check my ticket whether it is conformed or not.	5	Medium
Sprint-2	Payment	USN-3	As a passenger, I want to pay my ticket cost in online payment	15	High
Sprint-3	Booking Status	USN-4	As a passenger, I want to check my ticket once it is conformed.	5	Medium
Sprint-4	Updating Train Information	USN-5	As an admin, I want to check the trains details like when will train reach stations and update Train information.	10	Medium

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority
Sprint-3	Verifying Tickets	USN-6	As a TC, I want to check the users whether he/she have tickets or not with scanning the QR Code	15	High
Sprint-2	Knowing Current Location details	USN-7	As a passenger, I want to know the train current location.	5	Low
Sprint-4	Raise a compliant	USN-8	As a user, I should able to raise a ticket if something is wrong	10	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	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

6.3 REPORTS FROM JIRA SOFTWARE

SSFR Sprint 1 24 Oct – 31 Oct (5 issues) 0 0 10

SSFR-5 As a user, I can register through the f... REGISTRATION
SSFR-8 As a user, I can register through phon... REGISTRATION
SSFR-6 As a user, I will receive confirmation t... REGISTRATION
SSFR-7 As a user, I can login via login id and ... REGISTRATION
SSFR-9 As a user, I can enter the start and de... REGISTRATION

+ Create issue

SSFR Sprint 2 31 Oct – 5 Nov (4 issues) 0 0 10

SSFR-22 As a use, I can provide the basic details s... BOOKING
SSFR-11 As a user, I can choose the class, sea... BOOKING
SSFR-12 As a user, I can choose to pay through cr... PAYMENT
SSFR-13 As a user, I will be redirected to the select... REDIRECT

+ Create Issue

Backlog (0 of 8 issues visible)

Testcases Report T...xlsx ^ smart_solutions_f....png ^

15

CHAPTER 7

CODING AND SOLUTIONING

Feature 1
Node Red:
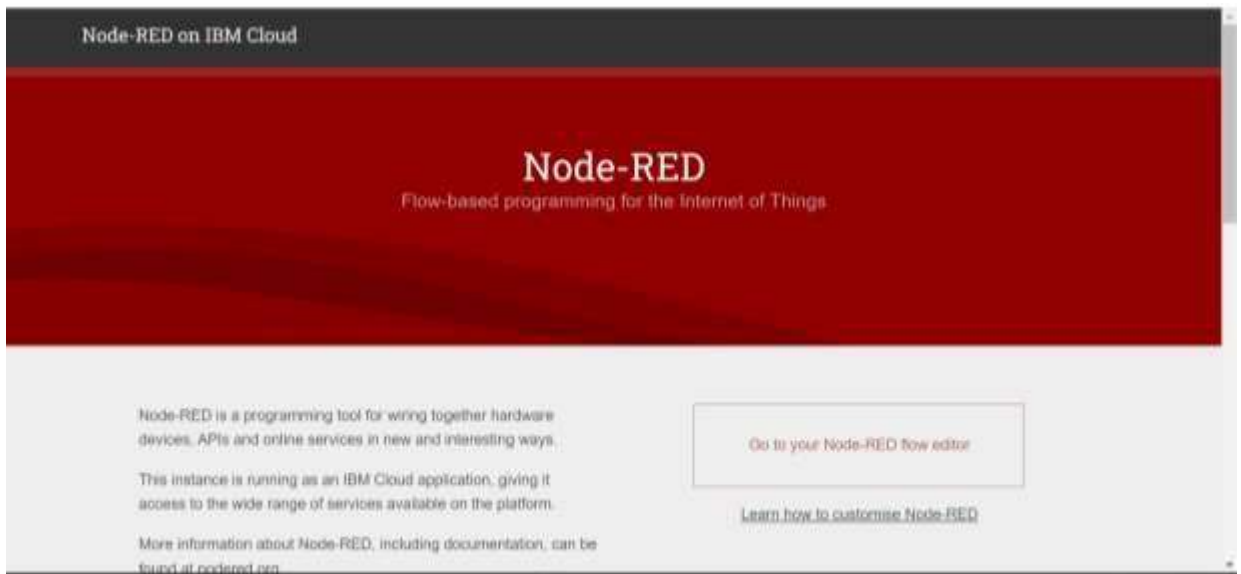
Cloudant DB:

FEATURE 2
HOME PAGE

QR CODE

DETAILS

QR code details:

Username:Srinath
Telephone:8665425359
Email:srinath@gmail.com
Date of Departing:2022-12-11
Source:chennai
Destination:pondicherry
Train No:16115
Train name:MS PDY EXPRESS
Seat booked:4
Class Type:2AC
Leaving time:6:10 PM

Copy text
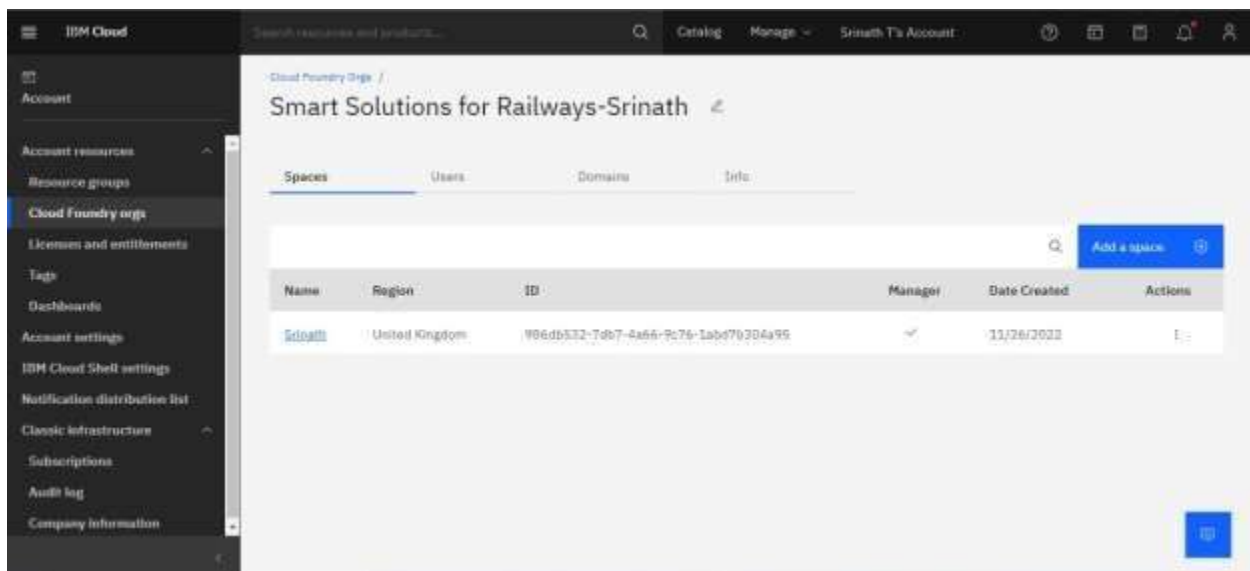
Scan the QRCode and get your train ticket.

A: Train Hasn't Started Yet. But All Looks Good . 16115
Ma Pdy Express runs between Chennai Egmore (MS) to
Puducherry (PDY). This train takes 4H 30M to cover this trip
and starts at 18:10 from Chennai Egmore (MS) and reaches
Puducherry (PDY) at 22:15. The exact current location of
train can be found at RailYatri where you see the train symbol
with an animation.

Submit

CHAPTER 8
TESTING

8.1 TEST CASES

A test case has components that describe input, action and an expected response, in order to determine if a feature of an application is working correctly. A test case is a set of instructions on "HOW" to validate a particular test objective/target, which when followed will tell us if the expected behavior of the system is satisfied or not. Characteristics of a good test case:

● Accurate: Exacts the purpose.

● Economical: No unnecessary steps or words.

● Traceable: Capable of being traced to requirements.

● Repeatable: Can be used to perform the test over and over.

● Reusable: Can be reused if necessary.

8.2 USER ACCEPTANCE TEST

The purpose of this document is to briefly explain the test coverage and open issues of the Smart Fashion Application project at the time of the release to User Acceptance Testing (UAT).

DEFAULT 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	Severity 4	Subtotal
By Design	13	4	2	3	22
Duplicate	1	0	5	0	4
External	2	4	0	1	7
Fixed	11	2	4	20	37
Not Reproduced	0	0	1	0	1
Skipped	0	0	1	1	2
Won't Fix	0	5	2	1	8
Totals	27	15	15	26	82

TEST CASE ANALYSIS

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

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	7	0	0	7
Client Application	50	0	0	50
Security	2	0	0	2
Outsource Shipping	3	0	0	3
Exception Reporting	9	0	0	9
Final Report Output	4	0	0	4
Version Control	1	0	0	1

CHAPTER 9

RESULTS

9.1 PERFORMANCE METRICS

CHAPTER 10

ADVANTAGES AND DISADVANTAGES

ADVANTAGES

➢ Openness – compatibility between different system modules, potentially from different vendors.

➢ Orchestration – ability to manage large numbers of devices, with full visibility over them.

➢ Dynamic scaling – ability to scale the system according to the application needs, through resource virtualization and cloud operation.

➢ Automation – ability to automate parts of the system monitoring application.

DISADVANTAGES

➢ Approaches to flexible, effective, efficient, and low-cost data collection for both railway vehicles and infrastructure monitoring, using regular trains.

➢ Data processing, reduction, and analysis in local controllers, and subsequent sending of that data to the cloud, for further processing.

➢ Online data processing systems, for real-time monitoring, using emerging communication technologies.

➢ Integrated, interoperable, and scalable solutions for railway systems preventive maintenance.

CHAPTER 11

CONCLUSION

Accidents occurring in Railway transportation system cost a large number of lives. So this system helps us to prevent accidents and giving information about faults or cracks in advance to railway authorities. So that they can fix them and accidents cases becomes less. This project is cost effective. By using more techniques they can be modified and developed according to their applications. By this system many lives can be saved by avoiding accidents. The idea can be implemented in large scale in the long run to facilitate better safety standards for rail tracks and provide effective testing infrastructure for achieving better results in the future.

CHAPTER 12

FUTURE SCOPE

In future CCTV systems with IP based camera can be used for monitoring the visual videos captured from the track. It will also increase security for both passengers and railways. GPS can also be used to detect exact location of track fault area, IP cameras can also be used to show fault with the help of video. Locations on Google maps with the help of sensors can be used to detect in which area track is broken.

CHAPTER 13

APPENDIX

Source Code :

Flask algorithm for developing a web application for reserving a ticket

```python
from flask import Flask, render_template, request
import qrcode
from PIL import Image
import MySQLdb.cursors
from flask_mysqldb import MySQL
import requests
from bs4 import BeautifulSoup
import pandas as pd
app = Flask(__name__)


app.config["MYSQL_HOST"] = "localhost"
app.config["MYSQL_USER"] = "root"
app.config["MYSQL_PASSWORD"] = "Grapes$1"
app.config["MYSQL_DB"] = "train"
mysql = MySQL(app)
train_no = ""
@app.route('/home', methods = ['POST', 'GET'])
def home():
    if(request.method == 'POST'):
        username = request.form['username']
```

```python
        tel = request.form['phoneno']

        email = request.form['email']

        date = request.form['date']

        source = request.form['source']

        destination = request.form['destination']

        seat = request.form['seat']

        trainname = request.form['trainname']

        classname = request.form['classType']

        cursor = mysql.connection.cursor(MySQLdb.cursors.DictCursor)

        cursor.execute('SELECT train_id, startTime, endTime,
SourceStation, DestinationStation FROM traintable WHERE train_name
= % s', (trainname,))

    trainDetails = cursor.fetchone()

    price = trainprice(source, destination, classname)

    price  = price * int(seat)

    train_id = str(trainDetails.get('train_id'))

    print(train_id)

    global train_no

    train_no = train_id

    details =
"Username:"+username+"\nTelephone:"+tel+"\nEmail:"+email+"\nDate
of
Departing:"+date+"\nSource:"+source+"\nDestination:"+destination+"\n
Train No:"+train_id+"\nTrain name:"+trainname+"\nSeat
booked:"+seat+"\nClass Type:"+classname+"\nLeaving
time:"+str(trainDetails.get('startTime'))
```

```python
        img = qrcode.make(details)

      # trainLocation(train_id)

        img.save('D:\\ELCOT\\Downloads\\Train-ticket-booking-system-
main\\Train-ticket-booking-system-main\\Ibm Project-
SSFR\\static\image\\qrcode.jpg')

        filename = 'qrcode.jpg'

        return render_template('qrcode.html', filename = filename, locatiom
= "")

    return render_template('indexs.html')

def trainprice(source, destination, classname):

    if (source == 'chennai' and destination == 'hyderbad') or (source ==
'hyderbad' and destination == 'chennai'):

        if(classname == '1AC'):

            return 1450

        elif(classname == '2AC'):

            return 1200

        elif(classname == 'FC'):

            return 800

        elif(classname == 'SL'):

            return 700

        elif(classname == '2S'):

            return 600

        else:

            return 450

    elif (source == 'chennai' and destination == 'kolkata') or (source ==
```

```python
'kolkata' and destination == 'chennai'):
    if(classname == '1AC'):
        return 2450
    elif(classname == '2AC'):
        return 2200
    elif(classname == 'FC'):
        return 1800
    elif(classname == 'SL'):
        return 1700
    elif(classname == '2S'):
        return 1200
    else:
        return 1000
elif (source == 'chennai' and destination == 'pondicherry') or (source
== 'pondicherry' and destination == 'chennai'):
    if(classname == '1AC'):
        return 450
    elif(classname == '2AC'):
        return 200
    elif(classname == 'FC'):
        return 150
    elif(classname == 'SL'):
        return 120
    elif(classname == '2S'):
        return 100
```

```python
    else:
        return 90
elif (source == 'kolkata' and destination == 'hyderbad') or (source ==
'hyderbad' and destination == 'kolkata'):
    if(classname == '1AC'):
        return 1450
    elif(classname == '2AC'):
        return 1200
    elif(classname == 'FC'):
        return 800
    elif(classname == 'SL'):
        return 700
    elif(classname == '2S'):
        return 600
    else:
        return 450
elif (source == 'pondicherry' and destination == 'hyderbad') or (source
== 'hyderbad' and destination == 'pondicherry'):
    if(classname == '1AC'):
        return 1250
    elif(classname == '2AC'):
        return 1000
    elif(classname == 'FC'):
        return 800
    elif(classname == 'SL'):
```

```python
            return 700

        elif(classname == '2S'):

            return 600

        else:

            return 450

    elif (source == 'kolkata' and destination == 'pondicherry') or (source
== 'pondicherry' and destination == 'kolkata'):

        if(classname == '1AC'):

            return 2950

        elif(classname == '2AC'):

            return 2300

        elif(classname == 'FC'):

            return 2100

        elif(classname == 'SL'):

            return 1900

        elif(classname == '2S'):

            return 1500

        else:

            return 1000

    else:

        return 1000


@app.route('/location', methods=['GET', 'POST'])

def trainLocation():

    url = "https://www.railyatri.in/live-train-status/"+train_no
```

```python
    print(type(train_no))


    htmldata = getdata(url)
    soup = BeautifulSoup(htmldata, 'html.parser')


    data = []
    for item in soup.find_all('script', type="application/ld+json"):
        data.append(item.get_text())
     print(len(data))
    df = pd.read_json(data[2])
    print(df["mainEntity"][0]['acceptedAnswer']['text'])
    return render_template("qrcode.html", filename = '/qrcode.jpg',
location = df["mainEntity"][0]['acceptedAnswer']['text'])
def getdata(url):
    r = requests.get(url)
     return r.text
app.debug = True
app.run(port=5000)
```

GITHUB LINK-

PROJECT DEMO LINK-

CHAPTER 14
REFERENCE

[1] "GSM and GPS Based Vehicle Location and Tracking System", Baburao Kodavati, V. K. Raju, S. Srinivasa Rao, A.V. Prabu, T. Appa Rao, Dr. Y. V. Narayana, International Journal of Engineering Research and Applications (IJERA) ISSN: 2248-9622 www.ijera.com Vol. 1, Issue 3, pp.616 625 2000.

[2] "Predicting Transit Vehicle Arrival Times". Kidwell,B, Geographic Laboratory, Bridgewater State College, Bridgewater, Mass., 2001.

[3] "Public Transport System Ticketing system using RFID and ARM processor Perspective Mumbai bus facility B.EST, Saurabh Chatterjee, Prof. Balram Timande, International Journal of Electronics and Computer Science Engineering, 2012.

[4] A User-Centered Design Approach to Self-Service Ticket Vending Machines". KARIN SIEBENHANDL GUNTHERSCHREDER, MICHAEL SMUC, EVA MAYR AND MANUEL NAGL IEEE TRANSACTION OPROFESSIONAL COMMUNICATION, VOL. 56, NO. 2, JUNE 2013.

[5] Vehicle Tracking and Locking System Based on GSM and GPS", R. Ramani, S. Valarmathy, Dr. N. SuthanthiraVanitha, S. Selvaraju, M. Thiruppathi, R. Thangam, MECS I.J. Intelligent Systems and Applications, 2013, 09.

[6] "Bus Tracking & Ticketing using USSD Real-time application of USSD Protocol in Traffic Monitoring", Siddhartha Sarma, Journal of Emerging Technologies and Innovative Research (JETIR) www.jetir.org, Dec 2014 (Volume 1 Issue 7).

[7] "Urban public transport service co-creation: leveraging passenger's knowledge to enhance travel experience. Antonio" A. Nunesa, Teresa Galvaoa, Joao Falcao e Cunhaa 2015.