

SMART SOLUTION FOR RAILWAYS

IBM PROJECT REPORT

BY

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1.INTRODUCTION

1.1 Project Overview:

Railways are playing a major role in transportation. Developments are required in this field to avoid long-standing queues for booking tickets and online ticket booking is a key solution to this problem. In the near future, people will see further advancements in railway systems, such as the development of fully automatic train operation, and real-time monitoring. All these are the services in smart rail systems which targets to improve safety, reliability, and quality-of-service (QoS). This project aims to provide solutions to enhance the travelling experiences of passengers with paperless ticketing, weather and train location tracking, clear information about the journey through QR code. The above solutions have been implemented using IBM node service, Cloudant DB and IBM Watson IOT platform.

1.2 Purpose:

Rail transport is more economical and widely preferred. Though there are certain factors like long queues for booking ticket, delays in train timings, uncertain weather, that make the journey unpleasant. Thus, by providing smarter solutions, we aim to address these problems and enhance the ticket booking process and to ensure a comfortable journey for the passengers.

2.LITERATURE SURVEY:

2.1 Existing Problems:

- Limitation in number of ticket counters causes rush during festive seasons.
- Sometimes Passengers need to face the unprofessional behavior of Railway staffs at the counter.
- Passengers are not aware of the weather at the destination station.
- Passengers are not notified about the delay in train timings.
- Counter ticket booking consumes a lot of time and man power.
- A lot of passengers travel without tickets.
- Printing the tickets leads to wastage of paper.

2.2 References:

1) S. Karthick. and A. Velmurugan., "Android suburban railway ticketing with GPS as ticket checker," 2012 IEEE

2) Sujith kumar S, K. M. Y. Pravan, V. Sumathy and Thejeswari C.K, "Novel approach for Smart Indian Railways," 2017 2nd International Conference on Computing and Communications Technologies (ICCCT).

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3)N. Vijayalakshmi, R. Shrinithi, V. Sanjana and T. Sowmiya, "Vehicle Tracking and Locking System Based on GSM and GPS," 2021 7th International Conference on Advanced Computing and Communication Systems (ICACCS), 2021

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

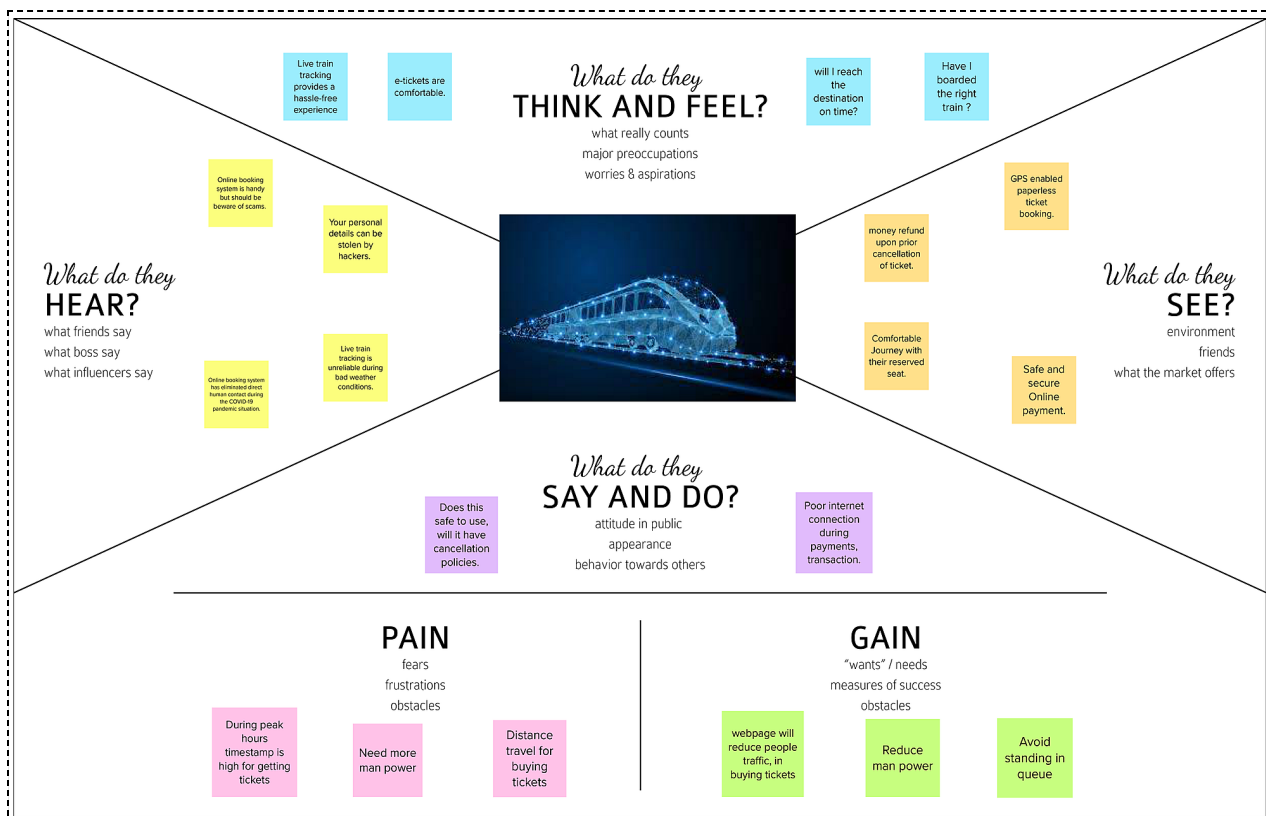
5)G. M. D'silva, A. K. Scariah, L. R. Pannapara and J. J. Joseph, "Smart ticketing system for railways in smart cities using software as a service architecture," 2017 International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud)

2.3 Problem Statement Definition:

Conventional Counter Booking system must be replaced with a Smart online ticket booking system which can allow the users to book tickets online and also updates passenger about the live location of the train and weather condition at destination . With this proposed system we can resolve the problems faced at ticket counters and save a lot of time, manpower and resources and also make the travel experience smooth.

3. IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas



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3.2 Ideation & Brainstorming

Brainstorm & idea prioritization

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

1. Welcome to session
2. Your brainstorm
3. 30 mins recommended

Define your problem statement

What problem are you trying to solve? Frame your problem as a clear "right to be solved". The idea is to be focused and specific.

Brainstorm

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

Group idea

Take 10 minutes to discuss your ideas with your team. Write down any ideas that come to mind that address your problem statement.

Prioritize

Write down all the ideas that come to mind. Then, write down the ideas that you think are the most important and feasible.

After you collaborate

You can use the ideas in a range of ways to solve your problem. Write down the ideas that you think are the most important and feasible.

Quick solutions

Write down the ideas that you think are the most important and feasible.

Key strategy to implement

Write down the ideas that you think are the most important and feasible.

3.3 Proposed Solution

S.NO	Parameter	Description
1	Problem Statement (Problem to be solved)	<ul style="list-style-type: none"> Counter ticket booking system consumes a lot of manpower, resources and time. Paper wastage for printing tickets must be reduced. Passengers are not aware of delays in train timings and climatic conditions of the destination. Smart facilities must be incorporated to provide a smooth and comfortable travel experience.
2		

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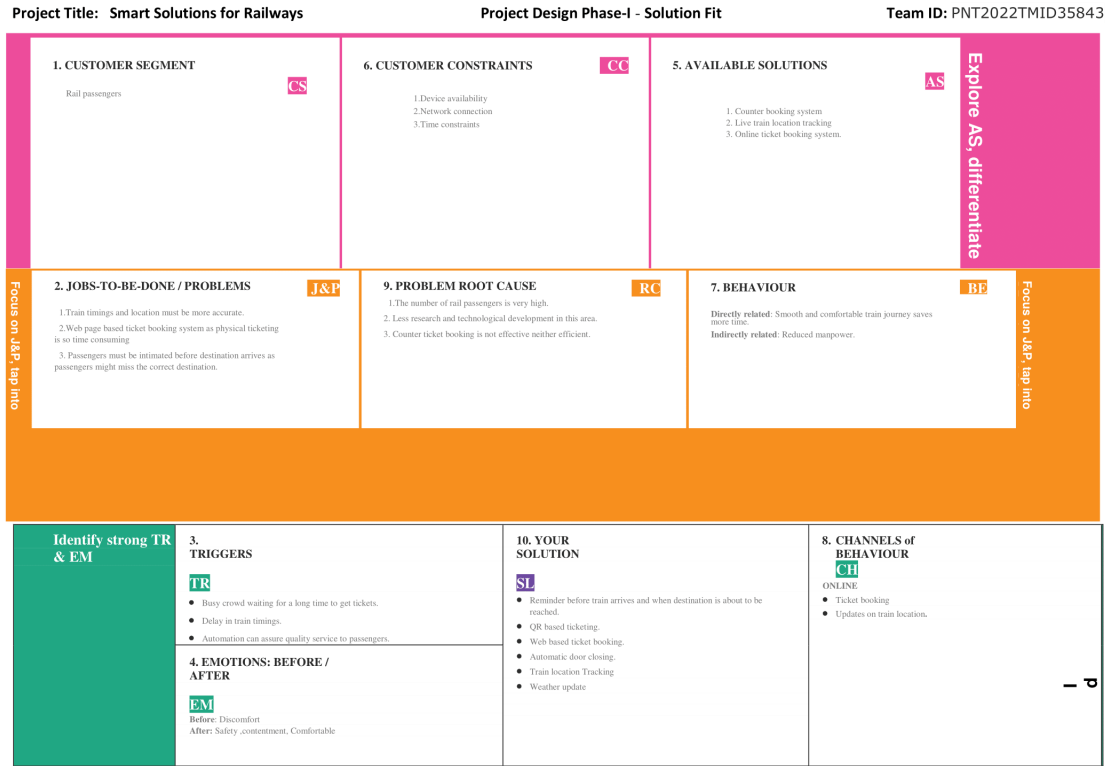
	Idea / Solution description	<ul style="list-style-type: none"> • A Web page must be designed for the public where they can book tickets by seeing the available seats so that there is no need for them to stand in queues of reservation counters. • After booking the ticket, the passenger will get a QR code that serves as proof of his reservation which serves as a better alternative in place of printed tickets. • This QR code can be used by ticket collectors to identify the personal details of the passenger. • Using a GPS module we can track the train and its live status is updated in the Web app continuously. • Before the train reaches the destination the passenger must be notified so that he won't miss his destination. • A reminder message with booking details must be sent to the passenger prior to his journey. • After the journey feedback can be collected from the passengers so that the service provided can be further improved. • The lighting systems inside the train can be controlled automatically based
3	Novelty / Uniqueness	<ul style="list-style-type: none"> • Passenger is notified before the arrival of the destination and the climatic conditions of the destination is also updated. • A reminder sent to the passenger prior to his

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		<p>journey.</p> <ul style="list-style-type: none"> • After the journey feedback can be collected from the passengers so that the service provided can be further improved. • Automatic and manual control of lighting system. • Automated doors to avoid footboards
4	Social Impact/ Customer Satisfaction	<ul style="list-style-type: none"> • Accidents due to foot-boards can be avoided. • Wastage of paper is reduced. • Passengers can ready themselves in case of delay or before the arrival of the destination and also prepare themselves depending on the climatic conditions this provides a hassle-free experience. • Manpower in reservation counters can be totally eliminated. • Power consumption in railways can be reduced.
5	Business Model (Revenue Model)	<p>Freemium model</p> <p>a user can book ticket online just by paying the ticket fee alone, but will be charged extra for additional functions such as train tracking, climate conditions updates, , and notification alert.</p>
6	Scalability of the Solution	<p>This solution can be extended all over the country, connecting all railway booking systems through the internet.</p>

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3.4 Problem solution fit:



4. REQUIREMENT ANALYSIS

4.1 Functional requirement

Funtional requirement no.	Functional Requirement(EPIC)	User Story/Task
1	User Registration	User registers through web or mobile application using E-mail,password,D-O-B.
2	Ticket Booking	User can login using login credentials and book tickets,see status of booking,see history of bookings.
3	QR code generation	User gets QR code once the ticket is booked.QR code must display the details of the user booking.

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4	QR scanner	Administrator side, it can be verified using the scanner app built.
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4.2 Non-Functional requirements

S.NO:	Non-Functional requirement	Description
1	Usability	<ul style="list-style-type: none">• Users can avoid counter ticket Bookings.• The user interface of the product will be easy to use, so that people can easily book tickets.• QR Code can be used instead of printing tickets.
2	Security	It stores the user information in a secure Database and will prevent unauthorized access to information.
3	Reliability	<ul style="list-style-type: none">• Provides no false information.• QR Code can be relied upon for ticket verification and, will not fail anytime.• User data is stored securely. Upon Transaction failure, your money will be refunded.
4	Performance	Tracks the train location as accurately as possible, and updates the weather condition continuously.
5	Availability	You can access it through website or mobile application anytime and from anywhere,

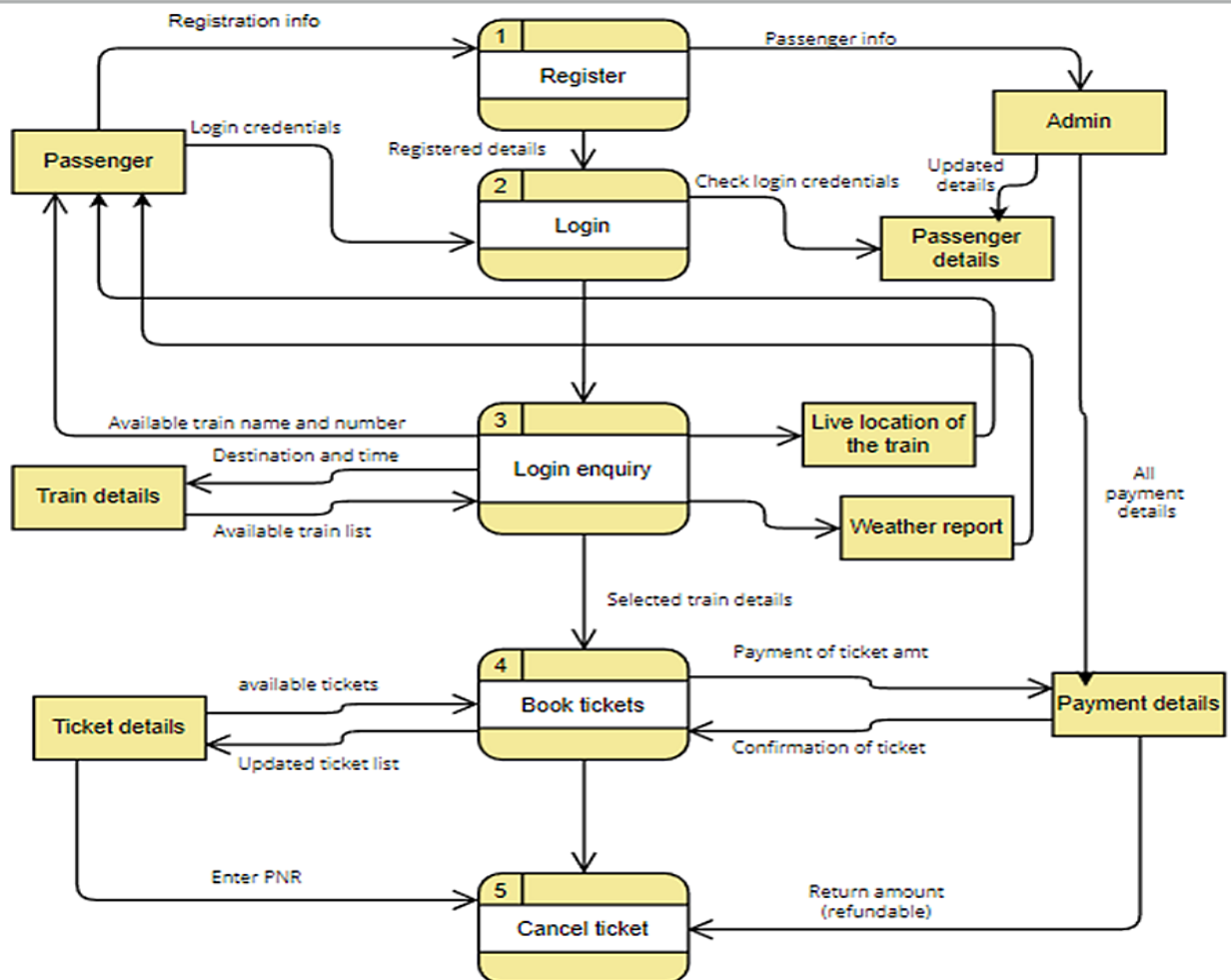
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		the only necessity is internet availability.
6	Scalability	The website traffic limit will be scalable enough to support large number of users at a time.

5. PROJECT DESIGN:-

5.1 Data Flow Diagrams

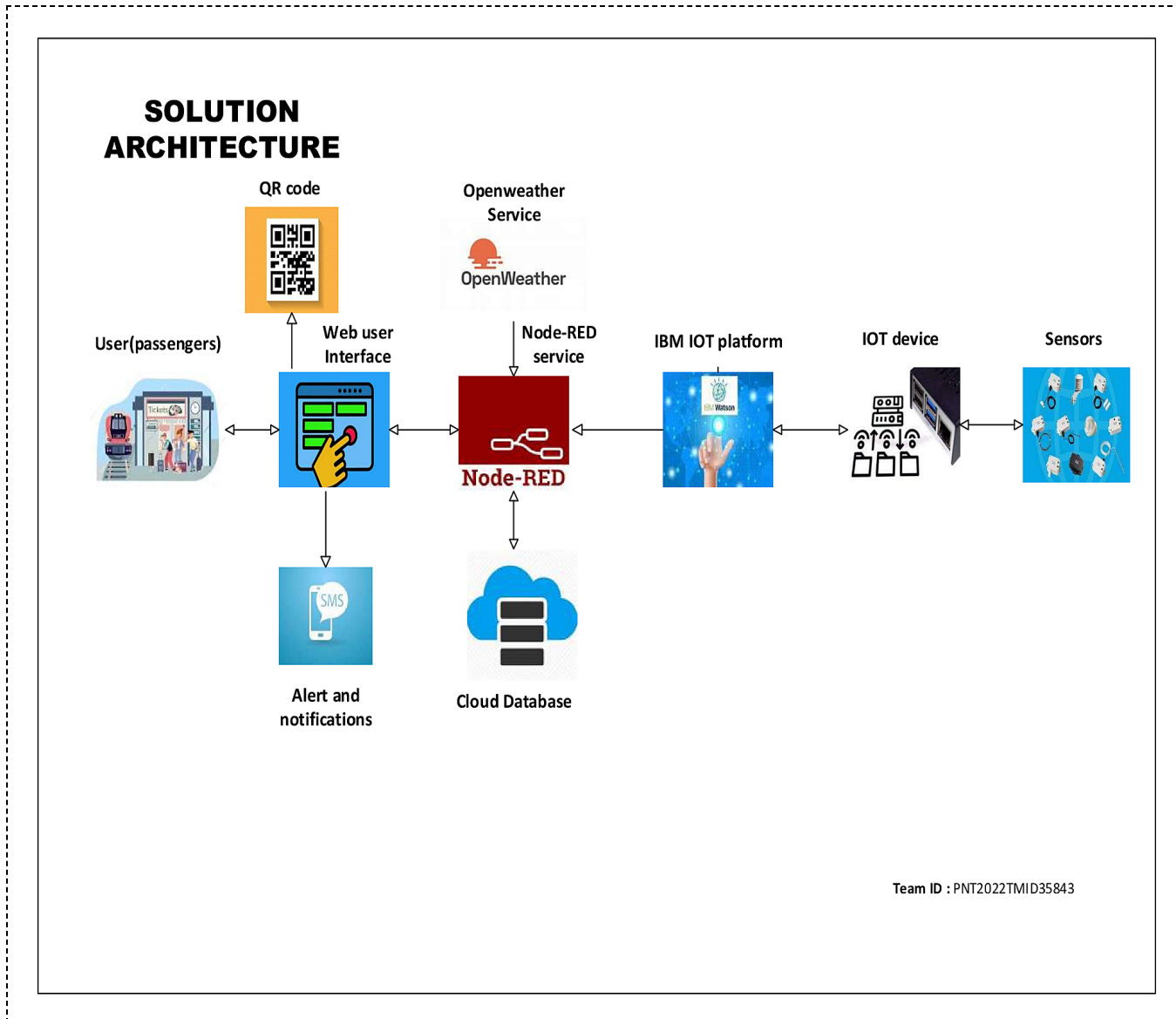
A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored



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5.2 Solution & Technical Architecture

The figure below show's our systems technical architecture.



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5.3 User stories

User type	Functional requirement	User story/task	Acceptance criteria	Priority
Customer (Mobile user)	Registration	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
		As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High
		As a user, I can register for the application using my mobile number and confirm through OTP received	I can register & access the dashboard with mobile number	Medium
		As a user, I can register for the application through Gmail	I can register & access the dashboard using mail credentials	Medium
	Login	As a user, I can log into the application by entering email & password	I can login using my email details	High
	Dashboard	As a user, I can navigate through the dashboard to get the details of seat availability and booking after logging in and entering the desired location and date	I can search for tickets based on availability to desired places on desired dates	High
		As a user, I can fill in my details and upload my ID proof and book ticket by online transaction	I can book the tickets by entering details and paying	High
		As a user, I can get the QR code for the payment and ticket booked	I can see the QR code storing the details of booking	Medium
		As a user ,I can check the weather details of the current location	I can see the weather report instantly	Low

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6. PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation & 6.2 Sprint Delivery Schedule

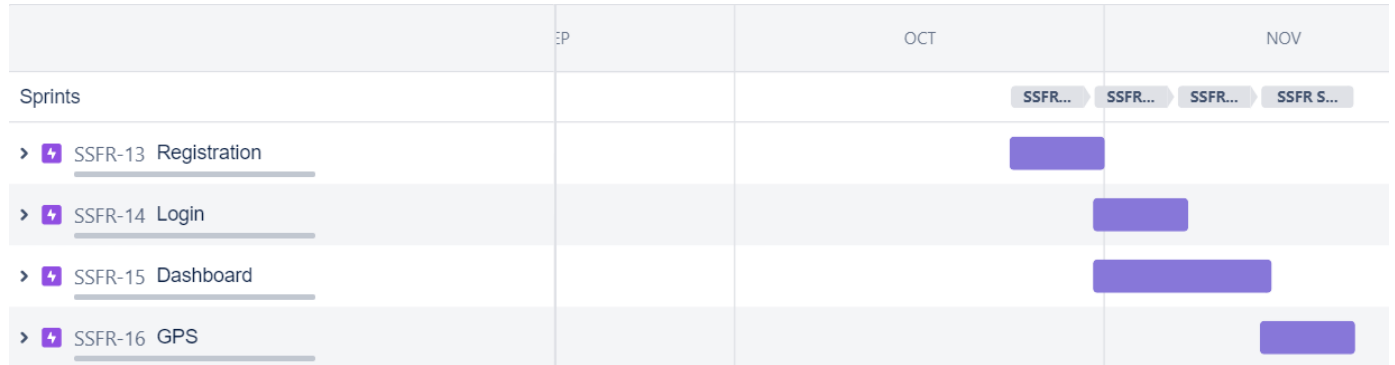
Sprint	Functional Requirement	User story number	User Story /Task	Story points	Priority	Team members
Sprint-1		USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	1	High	Dheepan P Akshay K P
Sprint-1		USN-2	As a user, I will receive a confirmation email once I have registered for the application	3	High	Dheepan P Akshay K P
Sprint-1		USN-3	As a user, I can register for the application using my mobile number and confirm through OTP received	3	low	Akshay K P Arul mozhi P
Sprint-1		USN-4	As a user, I can register for the application through Gmail.	1	medium	Akshay K P Diwakar B
Sprint-2	Login	USN-5	As a user, I can log into the application by entering mobile number, email & password.	2	High	Dheepan P Arul mozhi P
Sprint-2	Dashboard	USN-6	As a user, I can navigate through the dashboard to get the details of seat availability and booking after logging in and entering the desired location and date.	3	Medium	Dheepan p Diwakar B
Sprint-3		USN-7	As a user, I can fill in my details and upload my ID proof and book ticket by online transaction	3	High	Diwakar B Akshay K P
Sprint-3		USN-8	As a user, I will make the payment and will get the QR code for the ticket booked.	3	High	Everyone
Sprint-4	GPS	USN-9	As a user , I can check the weather details of the	2	Medium	Arul mozhi P Diwakar B

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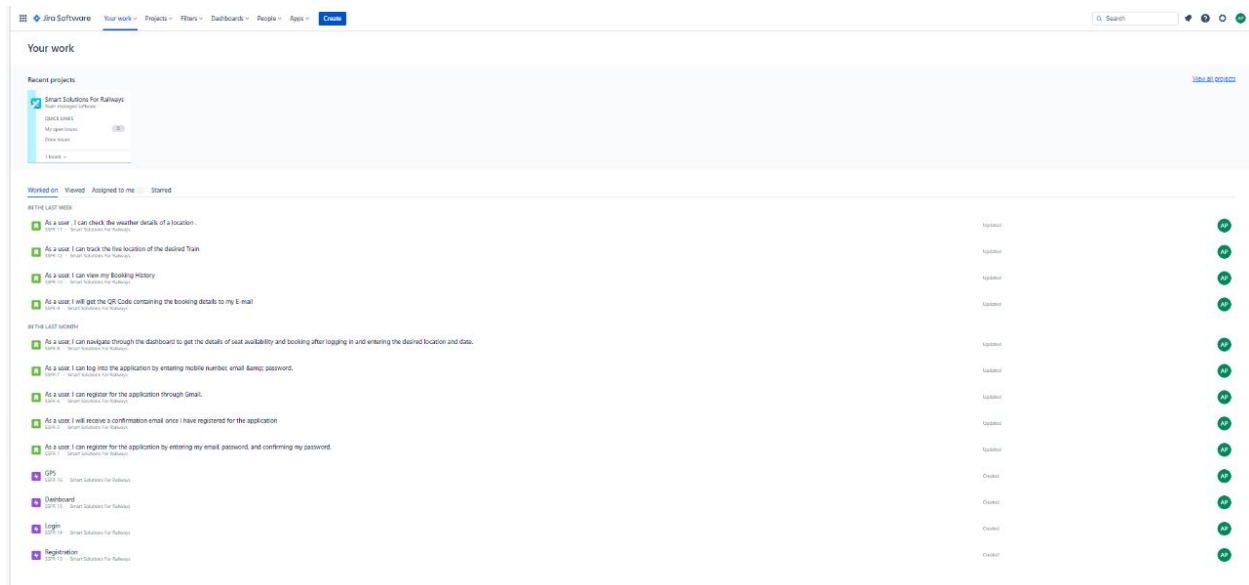
			current location and will also be able to track the train location.			
Sprint-4		USN-10	As a user, I will be able to view earlier travel details	1	Low	Dheepan P Akshay K p

6.3 Reports from JIRA

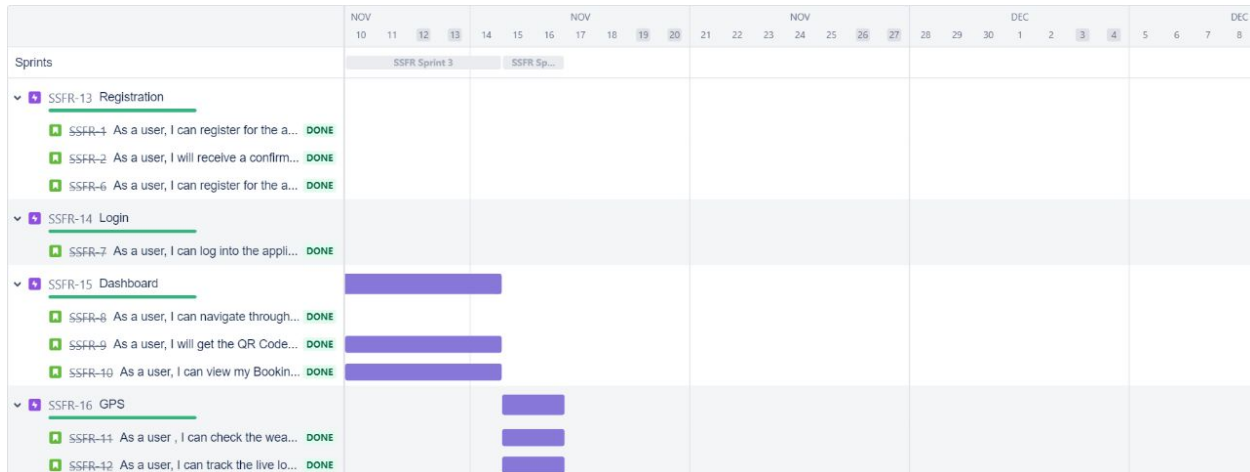
Before Starting Sprints



After Completing all the sprints



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7. CODING & SOLUTIONING :-

Features

7.1 Home Page

- User will have options such as sign-up, log-in and forgot password.

7.2 Signup

- User must fill all the necessary fields and submit his details an OTP will be sent to his entered E-mail upon successful verification of OTP an account will be created.
- If already existing username or password is entered user will be notified about the situation and will not be able to create an account.

7.3 Forgot password

- If the user forgets his login credentials he can use this option and fill in his registered E-mail his login details will be sent to his E-mail.

7.4 Login

- User can login with his registered E-mail and password.

7.5 Dashboard

- Upon successful login user will be able to access the dashboard.
- Book ticket, Location, Weather and Booking history options will be available in the dashboard.

7.6 Book Ticket

- After choosing the book ticket option in dashboard it redirects to the booking page.
- Upon selecting the Boarding, Destination and Date, in Train Name field only the Train's which Satisfies the above-selected options will be displayed.

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- Upon selecting the Train only the classes which are free for that particular train will be displayed.
- Then selecting the class will notify how many seats are available. Then the user has to enter the No of seats he wants to book and then press the submit button if the No of seats are more than available then it will notify the user about the situation and will ask again.
- Submit button will be enabled only when all the details match correctly.

7.7 QR-Code

- When all the booking details are filled correctly and submit button is pressed a QR-Code is generated.
- The generated QR-Code is sent to user's the E-mail ID. This QR Code can be used for future verification of ticket from the ticket collector's side.

7.8 Booking History

- User can view his booking history details by using the booking history option.

7.9 Location

By using the location option user can know the location of the desired train by choosing the train name. Location lat and lon are sent to the device using python script.
























7.9 Weather

- By using the weather option user can know the weather at the destination by selecting the destination's name.

Note: All the Features are explained with images in corresponding sprint.

7.10 Database Schema

All Databases

Your Databases				
Name	Size	# of Docs	Partitioned	Actions
booking	1.6 KB	11	No	  
noderedapp	85.9 KB	4	No	  
noderedtry2	97.8 KB	4	No	  
qrcode	141.7 KB	22 	No	  
signup	1.7 KB	9 	No	  
trainavailability	0.7 KB	3	No	  
trainseatavailability	0.9 KB	12	No	  

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Signup Database

signup		Document ID	Options
Documents		Table	Metadata
ery			
missions			
anges			
sign Documents			

_id	payload	socketid
0b6144f407c0ff8474a4fda4a9f5fc4	{ "name": "123", "age": 12, "gender": "M", "dob": "20...	
0d2ce02947608e4749ed0ed4aa03fca3	{ "name": "Arul", "age": 21, "gender": "Female", "do...	IZ42lvR8onsewRbvAABb
0d47e388b4209b1505ab575c30502006	{ "name": "akshay", "age": 22, "gender": "Male", "d...	40J3AXaYi-Uj0ZTQAAC0
77a1c7e4e4a31e1c473b25e8fa620e0e	{ "name": "12", "age": 12, "gender": "M", "dob": "20...	
7e680e1358f1c438b20fda41dcd2a35b	{ "name": "123", "age": 12, "gender": "M", "dob": "2...	
97ada43982e8d2c225ba53770490ddd9	{ "name": "eladheepan123", "age": 20, "gender": "...	9ZkvVSiX7-yWYxpCAABv
b8eeab5e96d2208628da90c97966b006	{ "name": "akshay123", "age": 45, "gender": "male"...	
f0a5497e1a29edd6fd1a67faecb7e47	{ "name": "12", "age": 12, "gender": "M", "dob": "20...	
f6a42e99aed57e252ea3a82bd3f9ed8	{ "name": "Diwakk", "age": 10, "gender": "M", "dob"...	L3KGPLqQvIh4BsyDAABz

Train availability Database

Key Features of this Database files :

1. File “_id” is given as boarding station so that while using cloudant node in Node-Red we can return only the file matching the selected boarding station using “search by “_id” option.
2. So this database gives the availability of trains that satisfies the boarding, destination and day of the selected date

trainavailability		Document ID	Options
Documents		Table	Metadata
ery			
rmissions			
anges			
sign Documents			

_id	day	destinations
Chennai	{ "Monday": [["Train1"], ["Train1"]], "Tuesday": [...	["Hyderabad", "Kerala"]
Hyderabad	{ "Monday": [["Train4", "Train5"], ["Train4"]], "Tu...	["Chennai", "Kerala"]
Kerala	{ "Monday": [["Train7"], ["Train7"]], "Tuesday": [...	["Hyderabad", "Chennai"]

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Train seat availability Database

Key features

1. "_id" is given as train name to make use of search by "_id" option in the cloudant node

trainseatavailability	Document ID	Options	{ } JSON
Documents	Table	Metadata	{ } JSON
Query			
Permissions			
Changes			
Design Documents			
byusername			
Metadata			
Search Indexes			

	1AC	2AC	3AC	General Class	Second Class
<input type="checkbox"/> 5	0	0	5	5	
<input type="checkbox"/> 5	2	5	5	5	
<input type="checkbox"/> 5	2	5	5	5	
<input type="checkbox"/> 0	0	0	0	0	0
<input type="checkbox"/> 2	1	5	5	5	
<input type="checkbox"/> 5	2	5	5	5	
<input type="checkbox"/> 1	0	0	5	5	
<input type="checkbox"/> 3	2	2	5	5	
<input type="checkbox"/> 5	2	5	5	5	
<input type="checkbox"/> 5	0	2	5	5	
<input type="checkbox"/> 0	0	0	0	0	0
<input type="checkbox"/> 5	5	5	5	5	

Booking Database

Key features:

1. We have added username as an index and used query in nodered to retrieve the files by using username as an index.

Permissions	_id	boarding	class	date	destination
Changes	<input type="checkbox"/> 123,2022-11-15T15:00:52....	Hyderabad	Second Class	November 4	Kerala
Design Documents	<input type="checkbox"/> 123,2022-11-17T06:30:18....	Chennai	3AC	November 18	Hyderabad
byusername	<input type="checkbox"/> 123,2022-11-17T06:38:16....	Hyderabad	3AC	November 25	Chennai
Metadata	<input type="checkbox"/> 123,2022-11-19T16:56:03....	Chennai	Sleeper Class	November 18	Hyderabad
Search Indexes	<input type="checkbox"/> 123,2022-11-19T18:05:08....	Chennai	3AC	November 18	Hyderabad
	<input type="checkbox"/> Arul,2022-11-16T00:59:33....	Chennai	Second Class	November 19	Kerala
	<input type="checkbox"/> Diwakk,2022-11-16T04:51....	Chennai	1AC	November 15	Hyderabad
	<input type="checkbox"/> Diwakk,2022-11-16T06:24....	Hyderabad	Sleeper Class	November 18	Kerala
	<input type="checkbox"/> _design/byusername				
	<input type="checkbox"/> eladheepan123,2022-11-16....	Chennai	Sleeper Class	November 18	Hyderabad
	<input type="checkbox"/> eladheepan123,2022-11-16....	Chennai	Sleeper Class	November 18	Hyderabad

QR-Code Database

Generated QR-Code details are stored here.

<

qrcode

:

Document ID

Options

{ } JSON

All Documents

+

Query

Permissions

Changes

Design Documents













+

Table

Metadata

{ } JSON

Create Document

	Boarding	Class	Date	Destination	Noofseats
<input type="checkbox"/>	 Hyderabad	3AC	November 2	Kerala	3
<input type="checkbox"/>	 Chennai	3AC	November 18	Hyderabad	4
<input type="checkbox"/>	 Hyderabad	3AC	November 25	Chennai	1
<input type="checkbox"/>	 Chennai	Sleeper Class	November 18	Hyderabad	2
<input type="checkbox"/>	 Chennai	3AC	November 18	Hyderabad	1
<input type="checkbox"/>	 Hyderabad	1AC	November 11	Chennai	4
<input type="checkbox"/>	 Kerala	2AC	November 12	Hyderabad	1
<input type="checkbox"/>	 Hyderabad	2AC	November 9	Kerala	2
<input type="checkbox"/>	 Hyderabad	1AC	November 4	Chennai	1
<input type="checkbox"/>	 Kerala	3AC	November 7	Chennai	3
<input type="checkbox"/>	 Chennai	Second Class	November 19	Kerala	2
<input type="checkbox"/>	 Chennai	1AC	November 15	Hyderabad	1

8. Testing

8.1 Test cases

Test Scenarios

- 1 Verify user is able to signup or not?
- 2 Verify whether the user is able to login after sign up
- 3 Verify whether the user is able to book tickets after logging into his account
- 4 Verify user is able to recovery username and password
- 5 Veriify whether the user is able to receive QR-Code to his e-mail after booking ticket
- 6 Verify whether the user is able to Track the live location of a train
- 7 Verify whether ther user is able to get the details of weateher condition of a particulr destination
- 8 Verify whether the user is able to see his booking history or not

8.2 User Acceptance Testing

https://docs.google.com/spreadsheets/d/1E9sostQoC2Wrzpogg20QdbdBKch47oUjv/edit?usp=share_link&ouid=11695819112082340268&rtprof=true&sd=true

9.RESULTS:

9.1 Performance metrics:

		End Of Test Report						
S.No	Project Overview	NFT Test approach	NFR - Met	Test Outcome	GO/NO-GO decision	Recommendations	Identified Defects (Detected/Closed/Open)	Approval/SignOff
1	A Web page is designed for the public where they can create an account and login to book tickets. 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 location of all trains are updated in the Web app continuously. All the booking details of the customers will be stored in the database and they can be retrieved back when the Ticket Collector scans the QR Code. User can also view Booking History and weather details in the web app.	Performance testing	Security, Scalability	Success	GO	The application can be equipped with more features and can be made more dynamic.	Payment feature is not implemented.	Akshay K P

		NFT - Detailed Test Plan			
S.No	Project Overview	NFT Test approach	Assumptions/Dependencies/Risks		Approval/SignOff
1	Smart Solutions for Railways	Performance testing	IBM Cloud Platform, IBM Watson IoT, Node Red, MIT app inventor		Akshay K P

10.ADVANTAGES AND DISADVANTAGES:

ADVANTAGES:

- 1) Ticket verification becomes easy with QR code.
- 2) Accurate prediction of train location reduces user waiting time.
- 3) Weather prediction helps user plan their journey accordingly.
- 4) Train location prediction reduces user waiting time.

DISADVANTAGES:

- 1) All the users must have digital gadgets and must have knowledge on how to use digital gadgets like smart phones.
- 2) Live location tracking may not be accurate if there exists poor network connectivity.
- 3) If the QR code is not kept securely by the user, there is possibility of misusing the information which the QR code contains.

11.CONCLUSION:

Internet Of Things is playing an important role in the future smart railway domain. This paper explored a potential solution by leveraging emerging IOT technologies to provide feasible solutions and services that addressed many of the existing user concerns. More specifically, we first briefly described the current trend for smart railway. Services and requirements of future

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smart railway were presented in the following. Finally, we pinpointed some open research issues and promising future directions, which may lead to valuable results.

12.FUTURE SCOPE:

This project addressed many of the existing user problems. Although, by implementing more features, the passenger experience can be further bettered.

In addition to real-time query and tracking the whole trajectory of the train and goods location, the IoT for railway can be developed to integrate sensing information of rail infrastructures, including bridges, viaducts, tunnels and rail gaps. This could be done by installing various sensing measures such as infrared sensors, sound sensors, and temperature sensors.

Emergency button that raises alert signal to nearest railway police station can be made available in the application to prevent harassment of women and children. Theft alarms, alerting the passengers prior to destination, food ordering inside the train, connecting to nearest railway clinic in case of medical emergency are some more features that can be added. These features can be implemented within the application and using cloud services.

In recent years, IoT technology has gradually attracted the attention of railway departments and industries all over the world. Developing railway IoT and building railway safety information-guaranteed systems based on IoT are important directions for the in-depth integration of railway information and industrialization.

13.APPENDIX:

NOTE: Our Projects whole json file is uploaded in Sprint4 ,each and every node has some piece of code inside, those codes are not included in this doc.

Code_1

This code generates name, latitude and longitude of the train and sends the details to the device created in IBM IOT Platform.

```
1 import wiotp.sdk.device
2 import time
3 import random
4 myconfig={
5     "identity": {
```

```

6  "orgId":"sw0rr5",
7  "typeId":"GPS",
8  "deviceId":"Train1"
9  },
10 "auth": {
11  "token":"kYH!(2sM47Cm-&0!h7"
12  }
13 }
14
15 def myCommandCallback(cmd):
16 print("Message from IBM IoT platform: %s"% cmd.data['command'])
17 m=cmd.data['command']
18 client=wiotp.sdk.device.DeviceClient(config=myconfig,logHandlers=N
    one)
19 client.connect()
20 def pub(data):
21 client.publishEvent(eventId="status",msgFormat="json",data=mydata,
    qos=0,onPublish
22 =None)
23 print("Data sent Sucessfully :",mydata)
24 while True:
25 mydata={'name':'Train1','lat':17.6387448,'lon':78.4754336}
26 pub(mydata)
27 time.sleep(5)
28 mydata={'name':'Train1','lat':17.6341908,'lon':78.4744722}
29 pub(mydata)
30 time.sleep(5)
31 mydata={'name':'Train1','lat':17.6340889,'lon':78.4745052}
32 pub(mydata)
33 time.sleep(5)
34 mydata={'name':'Train1','lat':17.6248626,'lon':78.4720259}
35 pub(mydata)
36 time.sleep(5)

```

SMART SOLUTIONS FOR RAILWAYS

```
37 mydata={'name':'Train1','lat':17.6248626,'lon':78.47202259}
38 pub(mydata)
39 time.sleep(5)
40 mydata={'name':'Train1','lat':17.6188577,'lon':78.4698726}
41 pub(mydata)
42 time.sleep(5)
43 client.commandCallback=myCommandCallback
44 client.disconnect()
45 #apikey a-sw0rr5-qucajgda23
46 #api token StQE8(uMve+86b20eN
```

code_2

To Scan the QR-code generated and verify whether the ticket is a valid one or not.

- If it's a valid QR then displays the ticket details
- If it's not a valid ticket then prints "not a valid ticket".

```
1 import cv2
2 import numpy as np
3 import time
4 import pyzbar.pyzbar as pyzbar
5 from ibmcloudant.cloudant_v1 import CloudantV1
6 from ibm_cloud_sdk_core.authenticators import BasicAuthenticator
7 authenticator = BasicAuthenticator('apikey-v2-
8 1ywbmkoh5znj05ylfvgqq92saysu3c0s9999nr3bwk2k','737d5bcca71833a59364eba
9 f237a0f2')
10 service=CloudantV1(authenticator=authenticator)
11 service.set_service_url('https://apikey-v2-
12 1ywbmkoh5znj05ylfvgqq92saysu3c0s9999nr3bwk2k:737d5bcca71833a59364eba9f
13 237a0f2@1126bfc5-
14 2dc8-436d-92d7-21d36731aebb-bluemix.cloudantnosqldb.appdomain.cloud')
```

SMART SOLUTIONS FOR RAILWAYS

```
13 cap=cv2.VideoCapture(0)
14 font=cv2.FONT_HERSHEY_PLAIN
15 while True:
16     _,frame=cap.read()
17     decodedObjects=pyzbar.decode(frame)
18
19     for obj in decodedObjects:
20         print("Data",obj.data)
21         a=obj.data[8:36]
22         cv2.putText(frame,"Ticket",(50,50), font, 2,(255,0,0),3)
23         print(a)
24         try:
25             response=service.get_document(db='qrcode',doc_id=a).get_result()
26             print(response)
27             time.sleep(5)
28         except Exception as e:
29             print("Not a valid Ticket")
30             time.sleep(5)
31         cv2.imshow("Frame",frame)
32         if (cv2.waitKey(1) & 0xFF==ord('q')):
33             break
34 cap.release()
35 cv2.destroyAllWindows()
36 client.disconnect()
```

GITHUB LINK: <https://github.com/IBM-EPBL/IBM-Project-429-1658300754>

PROJECT DEMO VIDEO LINK: <https://youtu.be/CynUmeWycM8>