



GKM COLLEGE OF ENGINEERING AND TECHNOLOGY

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IBM NALAIYATHIRAN PROJECT

**(Professional Readiness for Innovation, Employability and
Entrepreneurship)**

Project Name: SMART SOLUTION FOR RAILWAYS

Domain: Internet of Things

Github Link : <https://github.com/IBM-EPBL/IBM-Project-48535-1660809027>

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CHAPTER – 1

INTRODUCTION

1.1 PROJECT OVERVIEW

The main purpose of this project is develop smart solution for railways management. By implementing ticket booking system and location tracking using Watson IoT Platform. Connecting IoT devices to the Watson IoT platform and exchanging the sensor data. IBM Cloudant DB is store to data. Explore Python client libraries of Watson IoT Platform. Explore Python library for integrating OpenCV for accessing the Live Camera Input scan the QR code in live streaming and retrieve the QR code details Gain knowledge on web application development.

1.2 PURPOSE

There will an app for the public through which they can book tickets by seeing the available seats. After booking the person will get a QR code which has to be shown to the Tickets Collector at boarding. He scans the QR code to identify the personal details. Through this app the traveler can order the food, the pantry section will get the notification of order. A GPS module is present in the train to track it. The live status of the journey is updated in the app continuously. The user can set a notification for intimation the train live status for both boarding and destination stations.

CHAPTER – 2

LITERATURE SURVEY

S.No	TITLE	JOURNAL	AUTHOR	CHALLENGES/ FUTURE WORK
1	Planning, Analysing and Designing of Smart Railway Station	International Journal of Creative Research Thoughts (2020)	Soundappan.S,S rimaan.R, Venatesh.G, Sriram.M.	The journal describes about implementation for one particular junction.
2	Authentication System for Smart Railway Station	International Journal for Modern Trends in Science and Technology (2018)	Swati R.Khokale, Vaibhav U.Bunde, Shweta B.Karande, ShyamIngale, Mayuri Ghaywat.	<ul style="list-style-type: none"> ➤ The authentication system focused on providing platform tickets through web app. ➤ This leads to paper less tickets and helps to reduce crime in the platform.
3	Smart Railway Crossing using Microcontroller.	International Journal of Engineering Research & Technology (2020)	Sushant M.Gajbhiye, Raju A.Bondre, Zen P.Raut.	The objective of the research was to handle and control the system of railway gate by applying microcontroller.
4	Autonomous Rail Track Inspection using Vision Based System.	International Conference Computer Intelligence.	M.Singh, S.Singh, J.Jaiswal, J.Hempshall.	<ul style="list-style-type: none"> ➤ Automatically recognizes video sequence clips. ➤ Can't link together disconnected pixels.
5	Rail Crack Detection based on the adaptive noise cancellation method of EMD at high speed.	IEEE International Instrumentation and Measurement Technology	Xin Zhang, Yan Wang, Kangwei Wang, Yi Shen.	Signals at different speeds are investigated by the proposed method and the interference of noise signals is

		Conference		suppressed effectively.
6	Safety verification for train traffic control communication	IEEE journal on selected areas in communication (2012)	G.Tarnai	A safety connection between train and trackside is established using a safety communication protocol.
7	Ultrasonic characterization of defects in rails.	Insight-Non-Destructive Testing and Condition Monitoring (2002)	R.Clark, S.Singh, C.Haist	An alternative to electrical scanning and continuous beam steering was proposed using

2.1 EXISTING PROBLEM

Most of the public transportation infrastructure in European cities is easily accessible. The majority of the tram/train stations are located in an open and “gate-free” environment, easy available to everyone and hence introduces potential malfunctions in the system. This is why fare dodging (hopping on the tram/train without paying for a ticket) is simple. This paper suggests a conceptual framework and architecture to capture free riders (fare dodgers) in an early stage by using a RFID distance scan combined with people counting techniques as a tool to locate and monitor passengers. As a case study this paper uses the ticketing system in the Netherlands. It is a RFID-based ticketing system which uses a smartcard called OV-Chip card. It explains the current setup in The Netherlands, systems and architectures used and shows where possible problems and improvements could be achieved. An experiment is done to measure certain basic distance read ranges in different situations and locations. The results show that by making use of a different system architecture (RFID technology and People Counting Techniques) and improvement in catching free rides (fare-dodgers) in a much earlier stage is inspectors.

2.2 REFERENCES

- [1] S. Sawadisavi J. Edwards, E. Resend, J. Hart, C. Barkan, and N. Ahuja, “Development of a machine vision system for inspection of railroad track,” in Proc, Amer. Railway Eng.MaintenanceWay Assoc. Annu. 2012
- [2] M. Singh, S. Singh, J. Jaiswal, and J. Hempshall, “Autonomous railtrack inspection using vision based system,” in Proc. IEEE int. Conf. Comput.Intell. Homeland Secur. Pers. Safety, 2009
- [3] J. Lin, S. Luo, Q. Li, H. Zhang, and S. Ren, “Real-time rail head surface defect detection: A geometrical approach,” in Proc. IEEE Int. SympIndust. Electron., 2009.
- [4]. R. Clark, S. Singh, and C. Haist, “Ultrasonic characterization of defects in rails.” Insight, vol.44, no. 6, pp.341-347, 2002
- [5]. R. Edwards, S. Dixon, and X. Jian, “Characterisation of defects in the railhead using ultrasonic surface waves,” NDT & E Int., vol.39, no.6, pp. 468-475, 2006.
- [6]. Ramavath Swetha, P.V. Prasad Reddy, “Railway Track Crack Detection Autonomous Vehicle” ISSN, vol.4, Issue 2015.
- [7]. P. Navaraja, “Crack Detection System For Railway Track By Using Ultrasonic And Pir Sensor” IJAIC-2014
- [8]. A. H. Cribbens, “Solid-state interlocking (SSI): an integrated electronic signaling system for mainline railways,” IEE proceedings, 2012

2.3 PROBLEM STATEMENT DEFINITION

A problem statement is a concise description of the problem or issues a project seeks to address. The problem statement identifies the current state, the desired future state and any gaps between the two. A problem statement is an important communication tool that can help ensure everyone working on a project knows what the problem they need to address is and why the project is important.

Problem Statement

ONCE THE TEAM HAS DEFINED THE PROBLEM, TRANSFER THEIR OUTPUT IN THE TEXT BOXES BELOW, THEY SERVE AS THE SKELETON OF THE PROBLEM STATEMENT.

WHO?

Replace with the top voted persona

Railway Passangers and Railway management .

WHAT?

Replace with the top voted challenge

To ensure safe journey,building a critical infrastructure and provide data connectivity throughout the journey.

WHERE/ WHEN?

Replace with the top voted context

Implementation possible both in rural and urban. 24 hrs uninterrupted daily service.

WHY?

Replace with the top voted value for the customer

Customer value/benefit

Interoperability ,passenger friendly railway service, Intelligent mobility ,Advanced consumer technologies enhances connectivity ,allow passengers to stay connected with their smart devices while travelling and timely service.

Replace with the top voted value for the business

Business value/benefit

Reduced labour cost,Energy efficient and autonomous intelligence.

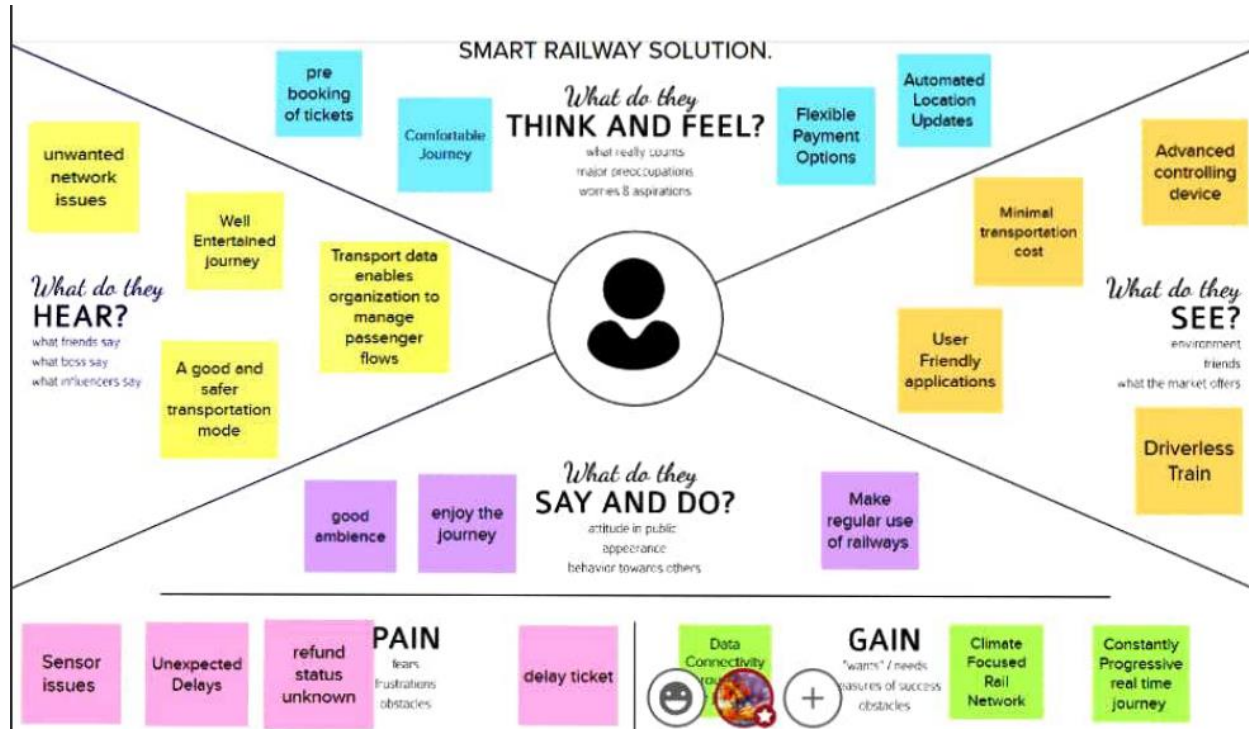
CHAPTER 3

IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas

An Empathy map is a collaborative tool teams can use to gain a deeper insight into their customers. Much like a user person, an empathy map can represent a group of users, such as a customer segment. The empathy map was originally created by Dave Gray and has gained much popularity within the agile community.

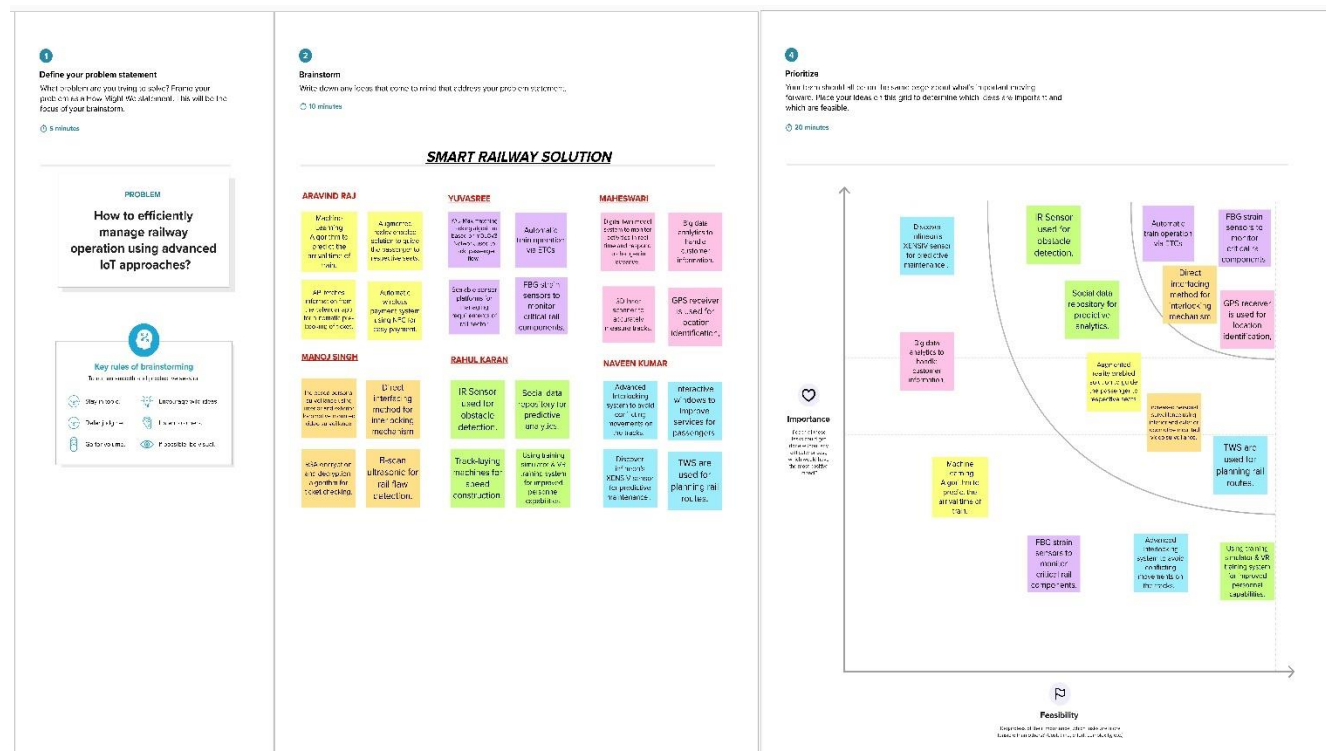
In this activity you are expected to prepare the empathy map canvas to capture the user Pains & Gains, Prepare list of problem statements.



3.2 Ideation & Brainstorming

Brainstorming is one of the primary methods employed during the Ideation stage of a typical Design Thinking process. Ideation refers to the whole creative process of coming up with and communicating new ideas. It can take many different forms, from coming up with a totally new idea to combining multiple existing ideas to create a new process or organizational system. Ideation is similar to a practice known as brainstorming.

In this activity you are expected to list the ideas by organizing the brainstorming session and prioritize the top 3 ideas based on the feasibility & importance.



3.3 PROPOSED SOLUTION

In this activity you are expected to prepare the proposed solution document, which includes the novelty, feasibility of idea, business model, social impact, scalability of solution, etc.,

S.No	PARAMETER	DESCRIPTION
1	Problem Statement (Problem to be solved)	In order to provide safe and secure journey to the passenger by using NODE-RED Service Web Application.
2	Idea/Solution description	<ul style="list-style-type: none">➤ Using Web application (developed by NODERED Services), user will be able to book the tickets based on the availability of seats.➤ The live location of train will be published in the IoT platform using python code➤ The train location can be easily tracked using web application.
3	Novelty/Uniqueness	<ul style="list-style-type: none">➤ The main goal is provide an authenticated and authorized booking system.➤ To provide user friendly platform for the users.
4	Social Impact/Customer Satisfaction	<ul style="list-style-type: none">➤ To improve railway service and the commuter's experience➤ The system will also be useful for crowd analysis.➤ To improve the authentication of railway ticket booking system
5	Business Model(Revenue Model)	<ul style="list-style-type: none">➤ In the business point of view, application is used to manage the passenger flow.➤ Efficiently reduces the labour cost.➤ The ticket collector can easily verify the ticket by scanning the unique QR code .
6	Scalability of the solution	<ul style="list-style-type: none">➤ The passenger flow can be easily measured.➤ The ticket booking system becomes more authenticated.➤ The passenger can track the live location the train from anywhere.

3.4 PROBLEM SOLUTION FIT

The Problem-Solution Fit canvas is based on the principles of Lean Startup, LUM (Lazy User Model) and User Experience design. It helps entrepreneurs, marketers and corporate innovators identify behavioral patterns and recognize what would work and why.

Technologically advanced approach to reduce the work load of the users and also the use of paper.

Focus on J&P, tap into BE, add new CS, CC, AS	1. CUSTOMER SEGMENT(S) CS Who is your customer? ➤ Railway passengers ➤ Ticket collectors ➤ Railway management system.	6. CUSTOMER CC What constraints prevent your customers from taking action or limit their choices of solutions? i.e. spending power, budget, no cash, network connection, available devices. ➤ Time slot management ➤ Cyber security issues ➤ Poor network connection. ➤ Poor functioning of server due to heavy network traffic ➤ Delayed location updates due to	5. AVAILABLE SOLUTIONS AS ➤ A user friendly web page – manages ticket booking. ➤ For each booking QR code is generated – for identifying passenger. ➤ Using GPS module – live status of the journey is updated. ➤ Passenger details are stored in database.
	2. JOBS-TO-BE-DONE / PROBLEMS J&P Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one. ➤ Efficient time management ➤ Continuous information updation. ➤ Authorized ticket management system. ➤ Simple and efficient verification system – both for management and passenger.	9. PROBLEM ROOT CAUSE RC What is the real reason that this problem exists? What is the back story behind the need to do this job? ➤ Manual ticket booking system is time consuming. ➤ Sudden cancellation of train are not updated on time. ➤ Ticket checking is time consuming and duplication of ticket can be sorted out easily.	7. BEHAVIOUR BE What does your customer do to address the problem and get the job done? ➤ Make use of authorized web pages- in order duplicate systems. ➤ Unique QR Code – Makes the job of ticket collector simple and can be carried out in an efficient manner. ➤ Live location of journey- helps the passenger to know there status constantly through out the journey.
Identify strong TR & EM	3. TRIGGERS TR What triggers customers to act? i.e. seeing their neighbour installing solar panels, reading about a more efficient solution in the news. Easy ticket booking system-that avoids long queues. Improved data confidentiality mechanism.	10. YOUR SOLUTION SL If you are working on an existing business, write down your current solution first, fill in the canvas, and check how much it fits reality. If you are working on a new business proposition, then keep it blank until you fill the canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behaviour. ➤ Ticket booking system – Web page designed where public can book seats based on the availability. ➤ Unique QR Code – For ensuring authorization ➤ GPS module present in the train – Tracking the live location of the train.	8. CHANNELS of BEHAVIOUR CH ONLINE Make use of authorized web page Make use of QR code- that confirms their passenger identity. OFFLINE What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development. Ticket collectors make use of QR Code scanners to get the passenger details. Passengers can board into their train without waiting in long queues for ticket booking.
	4. EMOTIONS: BEFORE / AFTER EM Passengers feel offline ticket booking is more time consuming process. It is difficult for ticket checker to sort out the duplication in tickets.		



CHAPTER 4

REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENT

Functional requirements describe the desired end function of a system operating within normal parameters, so as to assure the design is adequate to make the desired product and the end product reaches its potential of the design in order to meet user expectations.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Web application	<ul style="list-style-type: none">▪ User friendly environment▪ Efficient Database Connectivity▪ Resistance to network issues
FR-2	Ticket Booking	<ul style="list-style-type: none">▪ Information about seat availability▪ Appropriate price details▪ Easy payment options.
FR-3	Booking Confirmation	<ul style="list-style-type: none">▪ Unique QR Code generation▪ Quick Response▪ Good Connectivity with Cloud Database
FR-4	Ticket Checker(Passenger identification)	<ul style="list-style-type: none">▪ QR Code Scanner▪ Quick response from portal
FR-5	GPS Module	<ul style="list-style-type: none">▪ Sharing live location of train▪ Service without any interption

4.2 NON-FUNCTIONAL REQUIREMENT

Non-Functional Requirements ensure the software system follows legal and adherence rules, specify the quality attribute of the software, ensure the reliability, availability, performance, and scalability of the software system and help in constructing the security policy of the software system.

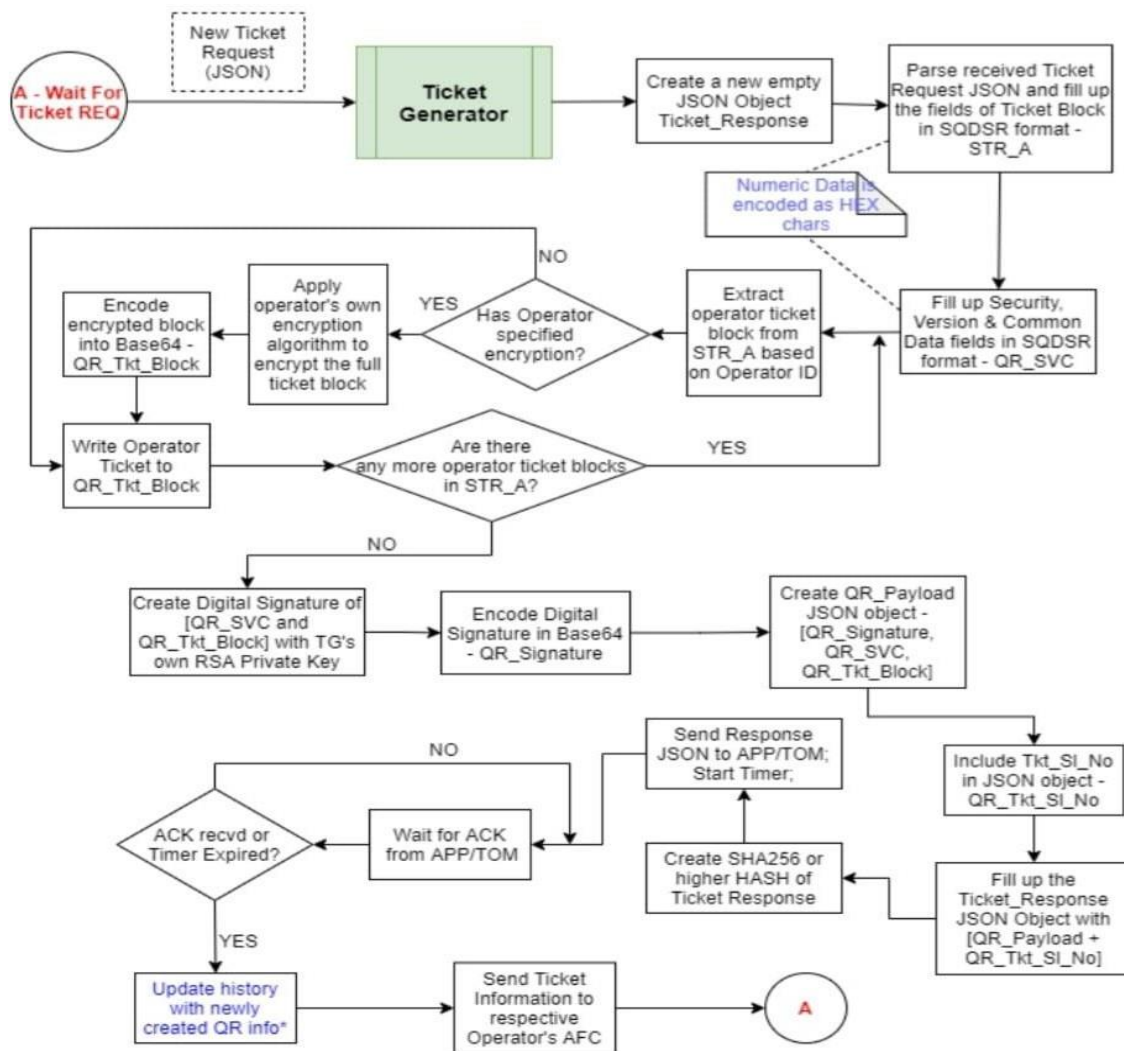
FR No.	Non-Functional Requirement	Description
NFR-1	Usability	Finest web application that allows users to make booking based on the availability.
NFR-2	Security	For each booking unique QR Code is generated
NFR-3	Reliability	Highly reliable since the unique QR Code generated helps to make proper evaluation of ticket booking
NFR-4	Performance	Better performance compared to ordinary ticket booking system as cloud database is used the server provides wide range of service without any lagging in the system
NFR-5.	Availability	Service provided by cloud database – establishes a wider range of availability of services.
NFR-6	Scalability.	Better scalability since the tracking of live location is possible for all the passengers throughout their journey. Better service scalability – in case of both ticket booking and ticket evaluation system.

CHAPTER – 5

PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS

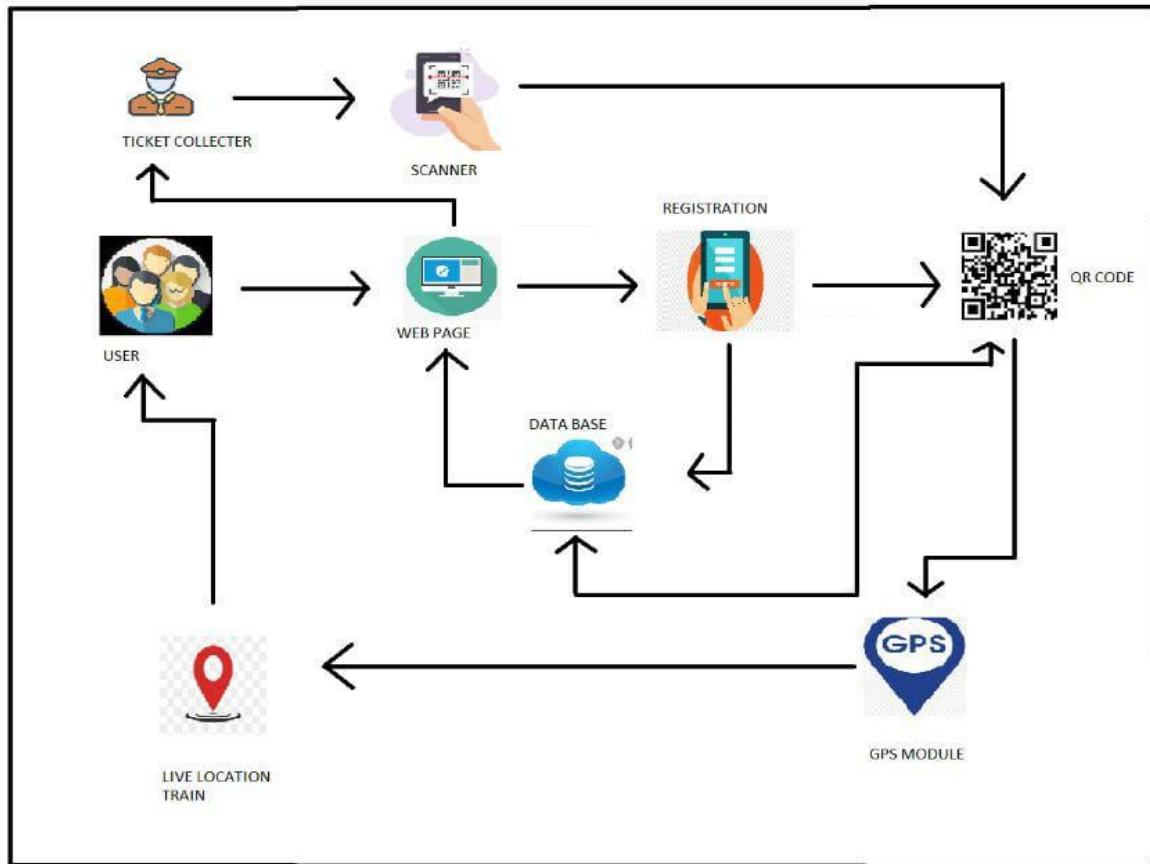
A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It can be manual, automated, or a combination of both. The objective of a DFD is to show the scope and boundaries of a system as a whole.



5.2 SOLUTION AND TECHNOLOGY ARCHITECTURE

Solution Architecture:

Solution architecture provides the ground for software development projects by tailoring IT solutions to specific business needs and defining their functional requirements and stages of implementation.



Technical Architecture:

Technical Architecture ensures that technology fits into existing computer systems by specifying its hardware, access methods, protocols and more.

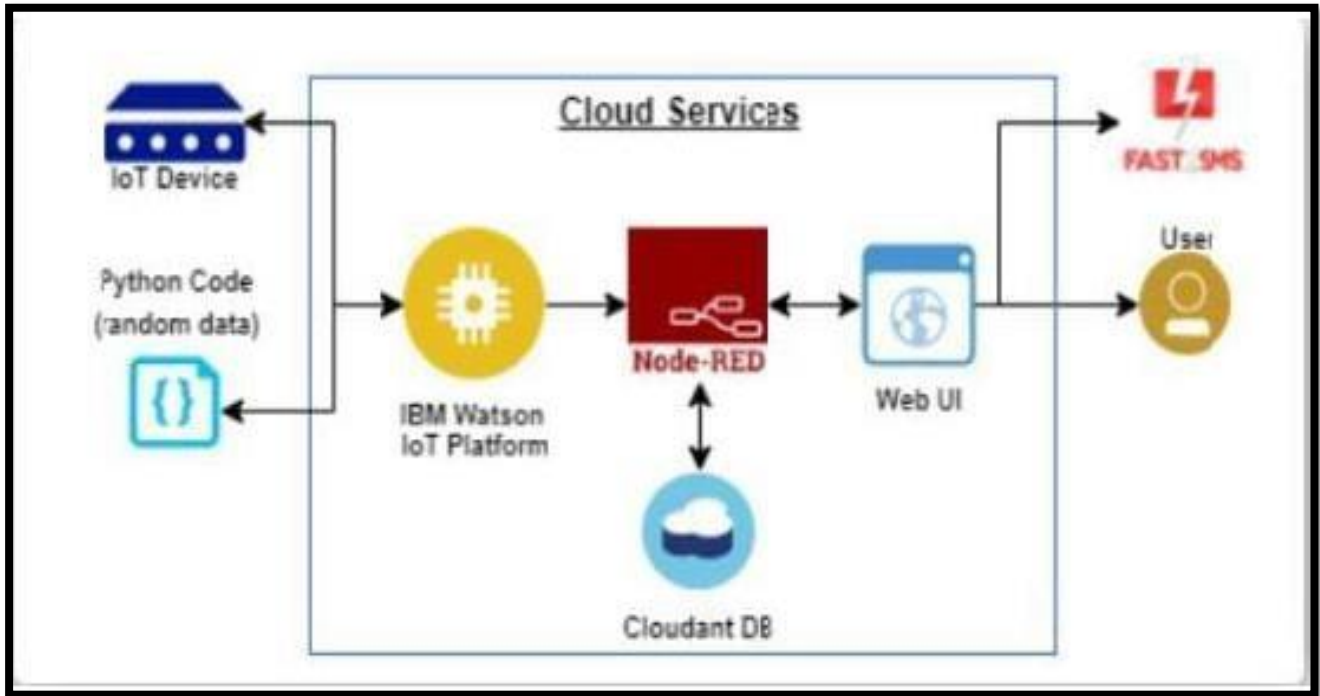


Table 1- **Components and Technology**

S.No	Component	Description	Technology
1	User Interface	User interaction with application. E.g: Web UI, Mobile App,etc..	HTML ,CSS, java Script, SMS for Web UI
2	Application Logic1	Processing logic of the application	Python script website application
3	Database	Data Organization, Retrieval ,etc.	MySQL, NoSQL, unique code generation, location co-ordination details.
4	Cloud Database	DBaaS Services, provide network access.	creating IBM Watson IOT Platform
5	File Storage	Hierarchical storage requirements	IBM Block Storage or Other Storage Service or Local File system.
6	External API-1	Purpose of External API used in the application	Node-RED key API
7	External API-2	Purpose of External API used in the application	Aadhar API, to identify, verify passenger information.
8	Machine Learning Model	Need of Machine Learning Model	Object Recognition Model, QR Codegeneration,scanning and validation.
9	Infrastructure (Serve/Cloud)	Application Deployment on local and cloud system	Local, Cloud Foundry, etc.

Table-2: Application Characteristics

S.No	Characteristics	Description	Technology
1	Open Source Framework	List of Open-source frameworks used in application	Python, HTML Java Script, Angular JS and Node
2	Security Implementation	List of all the security/ access controls implemented.	Encryption, IAM Controls, etc
3	Architecture scalability	Justifies the scalability of architecture	Increasing database capacity and combining features for easy accessibility.
4	Availability	Determining the availability of application.	Cookies are used for storing user data and to enhance the processing speed.
5	Performance	deducing consideration for the performance of the application.	Highly responsive servers are required to manage number of requests per second.

5.3 USER STORIES

A user story helps to create a simplified description of a requirement. User stories are often recorded on index cards, on Post-it notes, or in project management software.



CHAPTER-6

PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning and Estimation

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	4	High	Yuvasree R
Sprint-1	Registration (Confirmation)	USN-2	As a user, I will receive confirmation email once I have registered for the application	10	High	Yuvasree R, Manoj Singh.B, Rahul Karan.K
Sprint-1	Alternative Registration	USN-3	As a user, I can register for the application through Gmail	6	Medium	Yuvasree R, Maheswari.P, Naveen Kumar.C
Sprint-2	Dashboard	USN-4	As a user, We will be able to search for trains with dates and place of arrival and departure.	10	High	Yuvasree R, Rahul Karan.K, Aravind Raj
Sprint-2	Dashboard	USN-5	As a user, We	10	High	Yuvasree R,

			will be able to search make booking based on availability of seats and other options.			Rahul Karan.K, Aravind Raj
Sprint-3	Upload	USN-6	As a user, We will be able to upload all the required documents for booking tickets.	4	Medium	Yuvasree.R, Aravind Raj.R, Rahul Karan.K
Sprint-3	Payment	USN-7	As a user, I will be able to make payment for the booking.	6	High	Yuvasree R, Manoj Singh.B, Naveen Kumar.C
Sprint-3	QR code Generation	USN-8	From the Railways Management System, for each booking unique QR code is generated	10	High	Yuvasree R, Maheswari.P, Aravind Raj.R
Sprint-4	Ticket Checking	USN-9	Ticket checker will be able to verify the passenger details by scanning the QR Code	10	High	Yuvasree R, Manoj Singh.B, Naveen Kumar.C
Sprint-4	Live location Tracking	USN-10	User will able to track the live location of train using the application.	10	Medium	Yuvasree R, Rahul Karan.K, Maheswari P
Sprint	Functional	User	User Story /	Story	Priority	Team Members

	Requirement (Epic)	Story Number	Task	Points		
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	4	High	Yuvasree R
Sprint-1	Registration (Confirmation)	USN-2	As a user, I will receive confirmation email once I have registered for the application	10	High	Yuvasree R, Manoj Singh.B, Rahul Karan.K

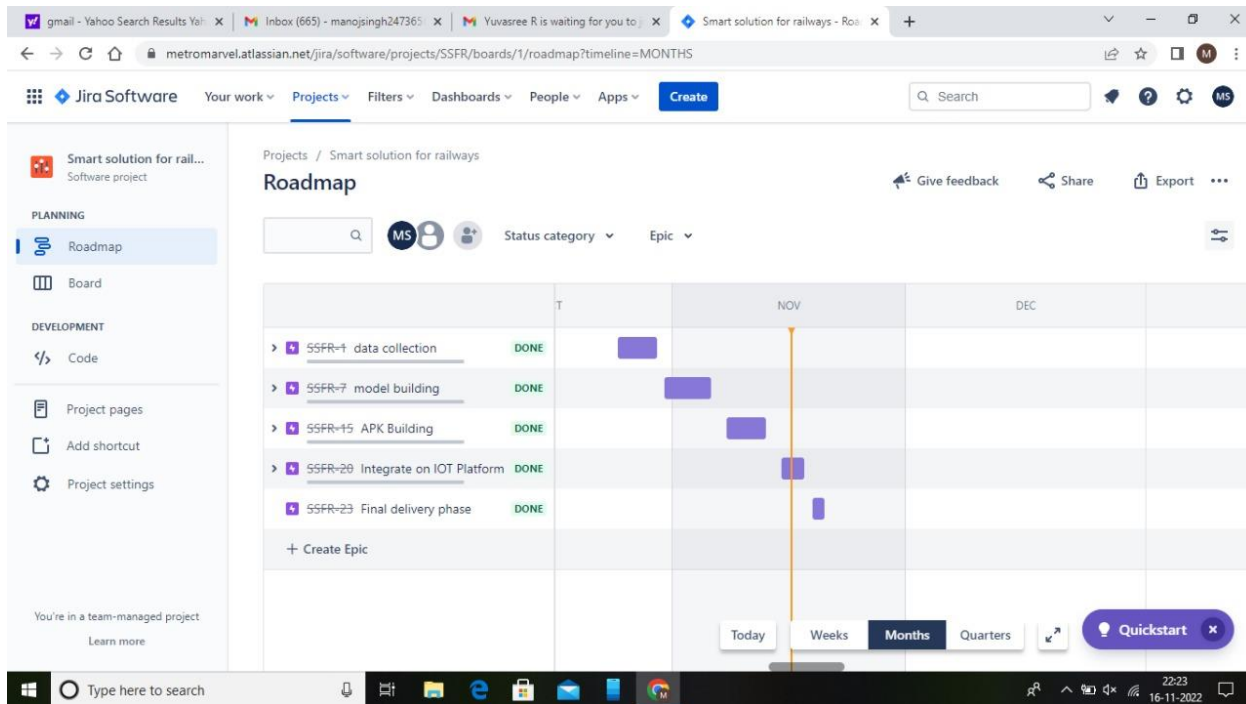
6.2 Sprint Delivery Schedule

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	30 Oct 2022		31 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022		06 Nov 2022
Sprint-3	20	6 Days	06 Nov 2022	11 Nov 2022		12 Nov 2022
Sprint-4	20	6 Days	12 Nov 2022	17 Nov 2022		18 Nov 2022

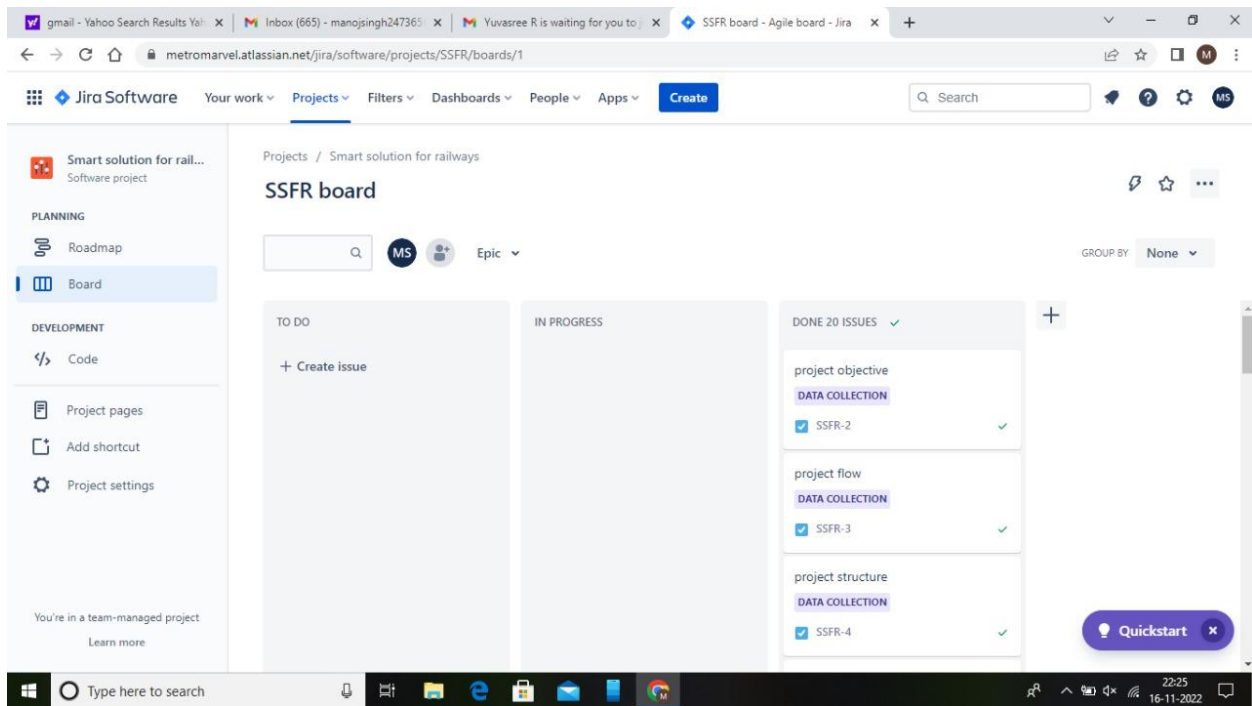
6.3 REPORTS FROM JIRA

JIRA is a software testing tool developed by the Australian Company Atlassian. It is a bug tracking tool that reports all the issues related to your software or mobile apps. JIRA is based on the Agile methodology.

A) Creating Road Map :



B) Create a SSFC board in Jira Software



CHAPTER-7

TESTING

7.2 USER ACCEPTANCE TESTING

User Acceptance Testing (UAT) is a type of testing performed by the end user or the client to verify/accept the software system before moving the software application to the production environment. UAT is done in the final phase of testing after functional, integration and system testing is done.

7.2.1 PURPOSE OF DOCUMENT

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

7.2.2 DEFECT ANALYSIS

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

Resolution	Severity1	Severity2	Severity3	Severity4	Subtotal
By Design	11	4	2	3	20
Duplicate	0	0	4	3	7
External	3	2	0	1	6
Fixed	7	4	3	14	28
Not Reproduced	0	0	2	0	2
Skipped	3	2	0	3	8
Won'tFix	0	2	2	2	6
Totals	24	14	14	26	77

7.2.3. TEST CASE ANALYSIS

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

Section	TotalCases	Not Tested	Fail	Pass
Functional	2	0	0	2
UI	2	0	0	2
Verification	1	0	0	1
Notification manager	1	0	0	1
Payment process	1	0	0	1
Generation	1	0	0	1

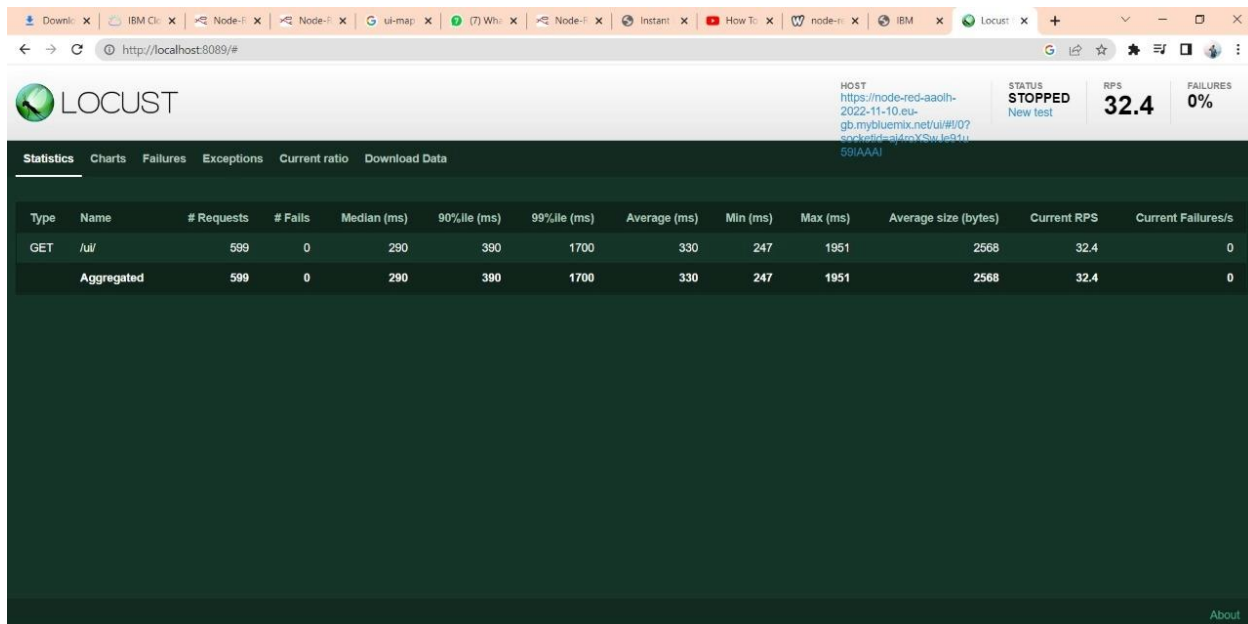
CHAPTER – 8

RESULTS

8.1 PERFORMANCE METRICS

```
locustfile.py - C:\Users\Suriya\locustfile.py (3.9.10)
File Edit Format Run Options Window Help

from locust import HttpUser, task
import random
import time
data = ({'user': 'test@myemail.com', 'passw': '12345'}, {'name': 'test@myemail.com', 'passw': '12345'}, {'user': 'test2@myemail.com', 'passw': '12345'})
post_headers={'Content-type': 'application/x-www-form-urlencoded'}
class Smartsolutionforrailways(HttpUser):
    @task
    def login_test(self):
        self.client.get("/login")
    @task
    def login_test(self):
        time.sleep(2)
        self.client.get("/loginpage",
                        data=data[random.randint(0,3)], headers= post_headers)
    @task(20)
    def login_test(self):
        self.client.get("/starts")
```



CHAPTER-9

ADVANTAGES & DISADVANTAGES

ADVANTAGES:

- Better organized
- Suitable for longer journeys
- Promotes tourism
- Less Time consume
- Less employee wages

DISADVANTAGES:

- Highly inflexible
- Costly if the routes are small
- Train parts are pretty old
- Unsuitable for perishable and fragile items
- Generates unemployment

CHAPTER -10

CONCLUSION

Thus, we have completed our paper “Planning, analyzing and designing of Smart railway station” successfully. The station is designed with standard basic requirements according to Indian railways rules and regulations. Due to increase in population, the rail transport tends to increase because of its low economy among the people. So for reducing the cost of purchasing additional land it needs to alter the existing structures into multi story building in which we can provide additional facilities for passengers, handicapped persons, transgender persons, porters and employees. This will help in maintenance and monitoring the condition of railway tracks without any errors and thereby maintaining the tracks in good condition, preventing train accidents to very large extent. Railway track crack detection autonomous vehicle.

CHAPTER – 11

FUTURE SCOPE

- Supervision of mechanical systems such as running gear and track. Identifying where problems arise on the track could significantly improve safety.
- Train doors could be monitored to see if they are properly closed. However, this would require operational changes as well, since passengers often leave doors open or even cling to the outside of the train in case of overloaded trains.
- Warning systems (light/acoustic) in case a train nears areas which are prone to accidents with people crossing the tracks.
- Monitoring of bridges regarding material stress or dynamic behavior to detect changes indicating future failure.
- Monitoring the speed of trains by GPS-driven speed measurements. Evaluating the speed profiles to validate the adherence of drivers to speed limits, but also to have real time train location to optimize traffic.

CHAPTER 12

APPENDIX

Location Tracking.py

```
import wiotp.sdk.device

import time

import random

myConfig = {

    "identity": {

        "orgId": "3edv2t",

        "typeId": "smartrailways",

        "deviceId": "1324"

    },

    "auth": {

        "token": "smart@123"

    }

}

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':'Train 1','lat':17.6387448,'lon':78.4754336}

    pub(myData)

    time.sleep(3)

    myData={'name':'Train2','lat':17.6387448,'lon':78.4754336}

    pub(myData)

```

```
time.sleep(3)
```

```
myData={'name':'Train 1','lat':17.6341908,'lon':78.4744722}
```

```
pub(myData)
```

```
time.sleep(3)
```

```
myData={'name':'Train 1','lat':17.6340889,'lon':78.4745052}
```

```
pub(myData)
```

```
time.sleep(3)
```

```
myData={'name':'Train 1','lat':17.6348626,'lon':78.4720259}
```

```
pub(myData)
```

```
time.sleep(3)
```

```
myData={'name':'Train 1','lat':17.6188577,'lon':78.4698726}
```

```
pub(myData)
```

```
time.sleep(3)
```

```
myData={'name':'Train 1','lat':17.6132382,'lon':78.4707318}
```

```
pub(myData)
```

```
time.sleep(3)
```

```
client.commandCallback=myCommandCallback
```

```
client.disconnect()
```

QR Code Scanner.py

```
import cv2

import numpy as np

import time

import pyzbar.pyzbar as pyzbar

from ibmcloudant.cloudant_v1 import CloudantV1

from ibmcloudant import CouchDbSessionAuthenticator

from ibm_cloud_sdk_core.authenticators import BasicAuthenticator


authenticator = BasicAuthenticator('apikey-v2-
16u3crmdpkghhxefdikvpssoh5fv5g3ubz','b0ab119f45d3e6255eabb978')

service=CloudantV1(authenticator=authenticator)

service.set_service_url("")


cap=cv2.VideoCapture(0)

font=cv2.FONT_HERSHEY_PLAIN
```

```

while True:

    _, frame=cap.read()

    decodedObjects=pyzbar.decode(frame)

    for obj in decodedObjects:

        #print("Data",obj.data)

        a=obj.data.decode('UTF-8')

        cv2.putText(frame,"Ticket",(50,50),font,2,

                    (255,0,0),3)

        #print(a)

        try:

            response=service.get_document(

                db='booking'

                doc_id=a

            ).get_result()

            print(response)

            time.sleep(5)

        except Exception as e:

            print("Not a Valid Ticket")

```

```
time.sleep(5)
```

```
cv2.imshow("Frame",frame)
```

```
if cv2.waitKey(1) & 0xFF == ord('q'):
```

```
    break
```

```
cap.release()
```

```
cv2.destroyAllWindows()
```

```
client.disconnect()
```

Node Red URL:

<https://node-red-aapkw-2022-11-18.eu-gb.mybluemix.net/ui/#!/0?socketid=0PmOLcS3UMuA4d59AAAM>

Node Red Json File:

<https://node-red-aapkw-2022-11-18.eu-gb.mybluemix.net/red/#flow/37450d132b5c816e>