Project Report

INTRODUCTION

1. INTRODUCTION

PROJECT OVERVIEW

SMART SOLUTIONS FOR RAILWAYS is to manage Indian Railways is the largest railway network in Asia and additionally world's second largest network operated underneath a single management. Due to its large size it is difficult to monitor the cracks in tracks manually. This paper deals with this problem and detects cracks in tracks with the help of ultrasonic sensor attached to moving assembly with help of stepper motor. Ultrasonic sensor allows the device to moves back and forth across the track and if there is any fault, it gives information to the cloud server through which railway department is informed on time about cracks and many lives can be saved. This is the application of IoT, due to this it is cost effective system. This effective methodology of continuous observation and assessment of rail tracks might facilitate to stop accidents. This methodology endlessly monitors the rail stress, evaluate the results and provide the rail break alerts such as potential buckling conditions, bending of rails and wheel impact load detection to the concerned authorities.

1.2. PURPOSE

Internet is basically system of interconnected computers through network. But now its use is changing with changing world and it is not just confined to emails or web browsing. Today’s internet also deals with embedded sensors and has led to development of smart homes, smart rural area, e-health care’s etc. and this introduced the concept of IoT . Internet of Things refers to interconnection or communication between two or more devices without human-to-human and human-to-computer interaction. Connected devices are equipped with sensors or actuators perceive their surroundings. IOT has four major components which include sensing the device, accessing the device, processing the information of the device, and provides application and services. In addition to this it also provides security and privacy of data . Automation has affected every aspect of our daily lives. More improvements are being introduced in almost all fields to reduce human effort and save time. Thinking of the same is trying to introduce automation in the field of track testing. Railroad track is an integral part of any company's asset base, since it provides them with the necessary business functionality. Problems that occur due to problems in railroads need to be overcome. The latest method used by the Indian railroad is the tracking of the train track which requires a lot of manpower and is time-consuming

LITERATURE SURVEY

2. LITERATURE SURVEY

EXISTING SYSTEM

In the Existing train tracks are manually researched. LED (Light Emitting Diode) and LDR (Light Dependent Resister) sensors cannot be implemented on the block of the tracks]. The input image processing is a clamorous system with high cost and does not give the exact result. The Automated Visual Test Method is a complicated method as the video color inspection is implemented to examine the cracks in rail track which does not give accurate result in bad weather. This traditional system delays transfer of information. Srivastava et al., (2017) proposed a moving gadget to detect the cracks with the help of an array of IR sensors to identify the actual position of the cracks as well as notify to nearest railway station . Mishra et al., (2019) developed a system to track the cracks with the help of Arduino mega power using solar energy and laser. A GSM along with a GPS module was implemented to get the actual location of the faulty tracks to inform the authorities using SMS via a link to find actual location on Google Maps. Rizvi Aliza Raza presented a prototype in that is capable of capturing photos of the track and compare it with the old database and sends a message to the authorities regarding the crack detected. The detailed analysis of traditional railway track fault detection techniques is explained in table

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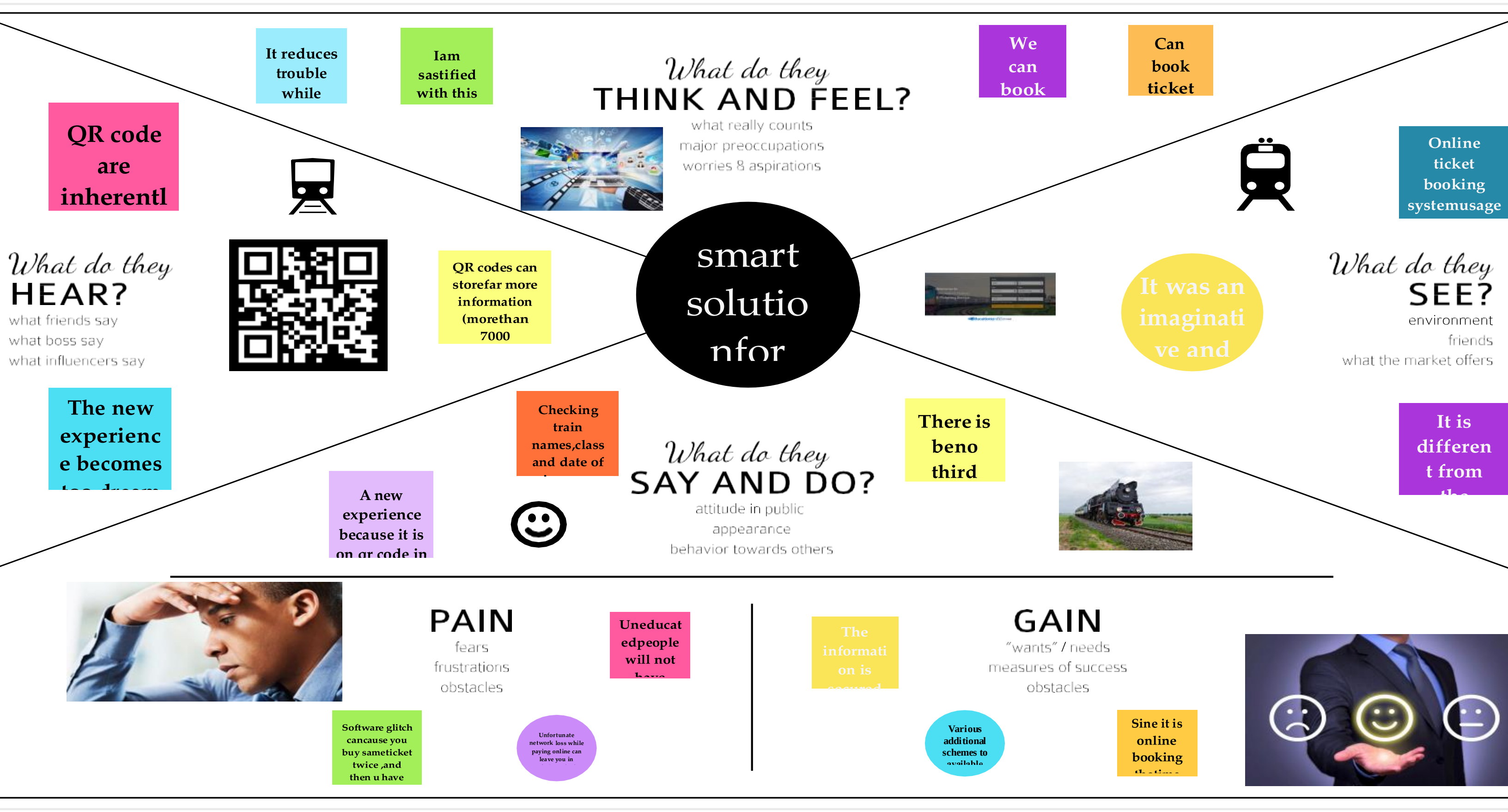
PROBLEM STATEMENT DEFINITION

Among the various modes of transport, railways is one of the biggest modes of transport in the world. Though there are competitive threats from airlines, luxury buses, public transports, and personalized transports the problem statement is to answer the question “What are the problems faced by the passengers while travelling by train at station and on board”

IDEATION AND PROPOSED SOLUTION

3. IDEATION AND PROPOSED SOLUTON

EMPATHY MAP CANVAS



It reduces trouble while

Iam sastified with this

What do they THINK AND FEEL?
what really counts
major preoccupations
worries & aspirations

We can book

Can book ticket

QR code are inherentl

Online ticket booking systemusage

smart solutio nfor

What do they HEAR?
what friends say
what boss say
what influencers say

QR codes can storefar more information (morethan 7000

It was an imaginati ve and

What do they SEE?
environment
friends
what the market offers

The new experienc e becomes

Checking train names,class and date of

There is beno third

It is differen t from

A new experience because it is on qr code in

What do they SAY AND DO?
attitude in public
appearance
behavior towards others

PAIN
fears
frustrations
obstacles

Uneducat edpeople will not

Software glitch cancause you buy sameticket twice ,and then u have

Unfortunate network loss while paying online can leave you in

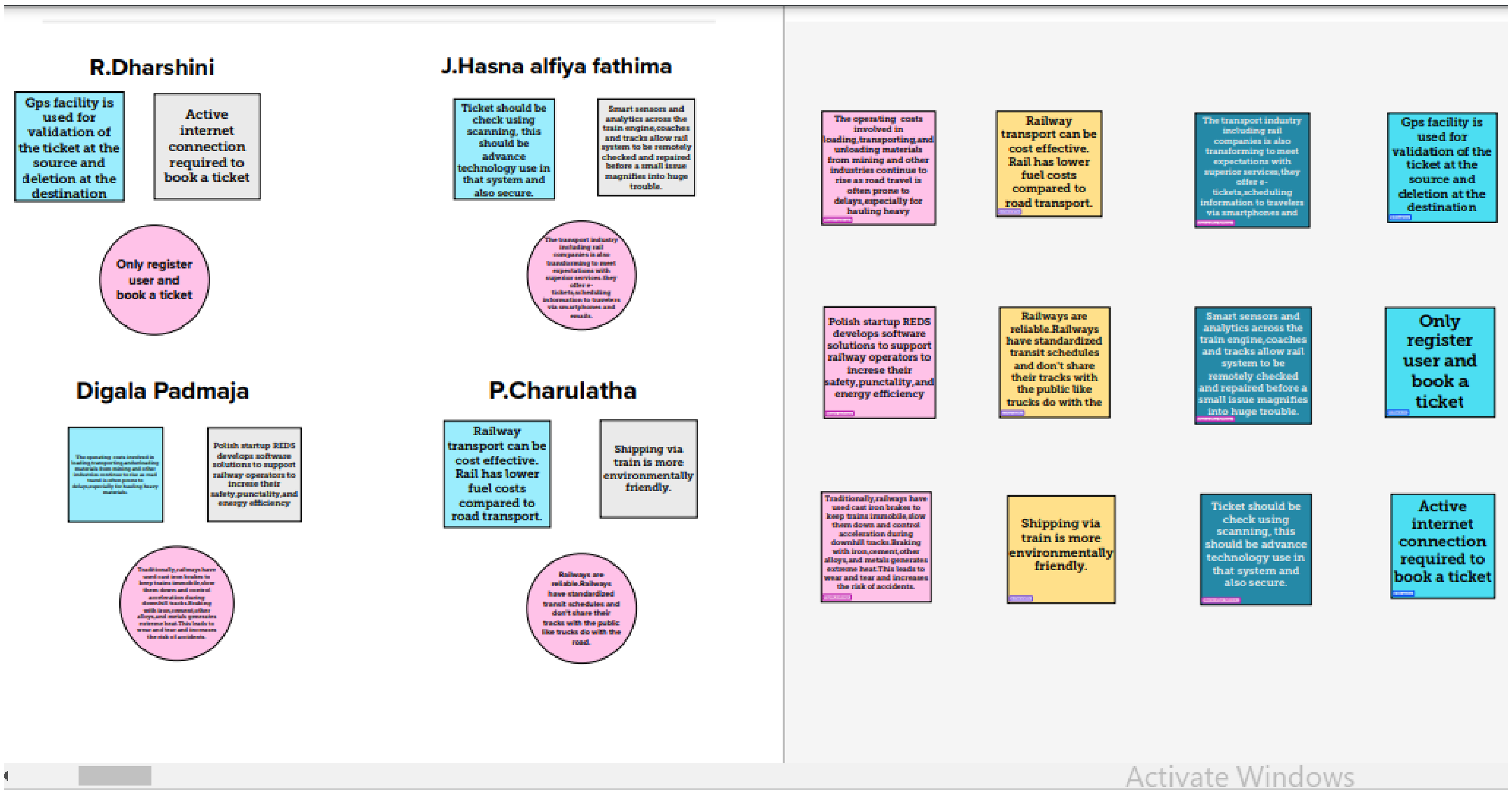
The informati on is

GAIN
"wants" / needs
measures of success
obstacles

Various additional schemes to

Sine it is online booking

IDEATION & BRAINSTORMING



R.Dharshini

Gps facility is used for validation of the ticket at the source and deletion at the destination

Active internet connection required to book a ticket

Only register user and book a ticket

J.Hasna alfiya fathima

Ticket should be check using scanning, this should be advance technology use in that system and also secure.

Smart sensors and analytics across the train engine,coaches and tracks allow rail system to be remotely checked and repaired before a small issue magnifies into huge trouble.

The transport industry including rail companies is also transforming to meet expectations with superior services.they offer e-tickets,scheduling information to travelers via smartphones and emails.

Digala Padmaja

The operating costs involved in loading,transporting,and unloading materials from mining and other industries continue to rise as road travel is often prone to delays,especially for hauling heavy materials.

Polish startup REDS develops software solutions to support railway operators to increse their safety,punctality,and energy efficiency

Traditionally,railways have used cast iron brakes to keep trains immobile,slow them down and control acceleration during downhill tracks.Braking with iron,cement,other alloys,and metals generates extreme heat.This leads to wear and tear and increases the risk of accidents.

P.Charulatha

Railway transport can be cost effective. Rail has lower fuel costs compared to road transport.

Shipping via train is more environmentally friendly.

Railways are reliable.Railways have standardized transit schedules and don't share their tracks with the public like trucks do with the road.

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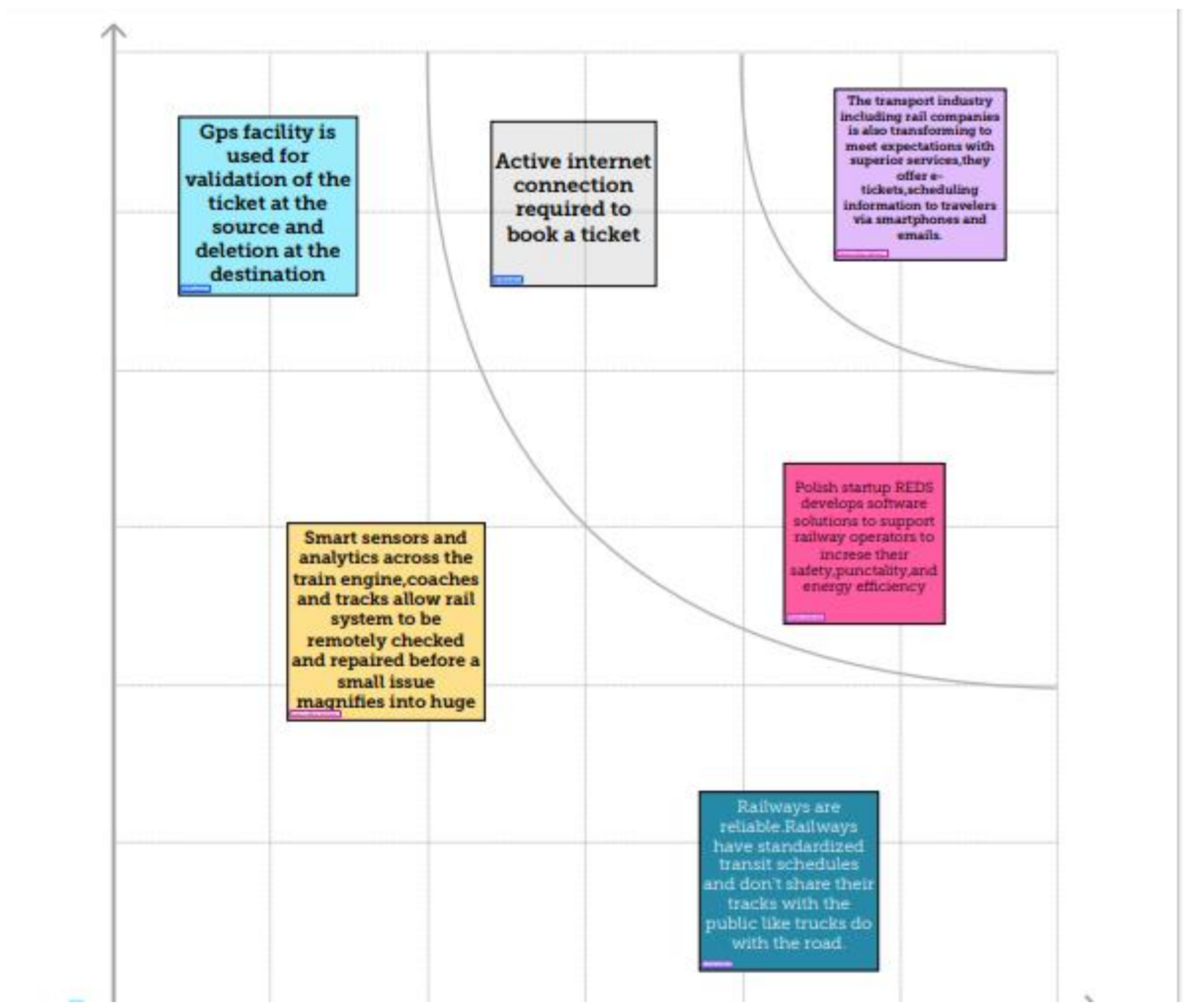
Activate Windows



Gps facility is used for validation of the ticket at the source and deletion at the destination

Active internet connection required to book a ticket

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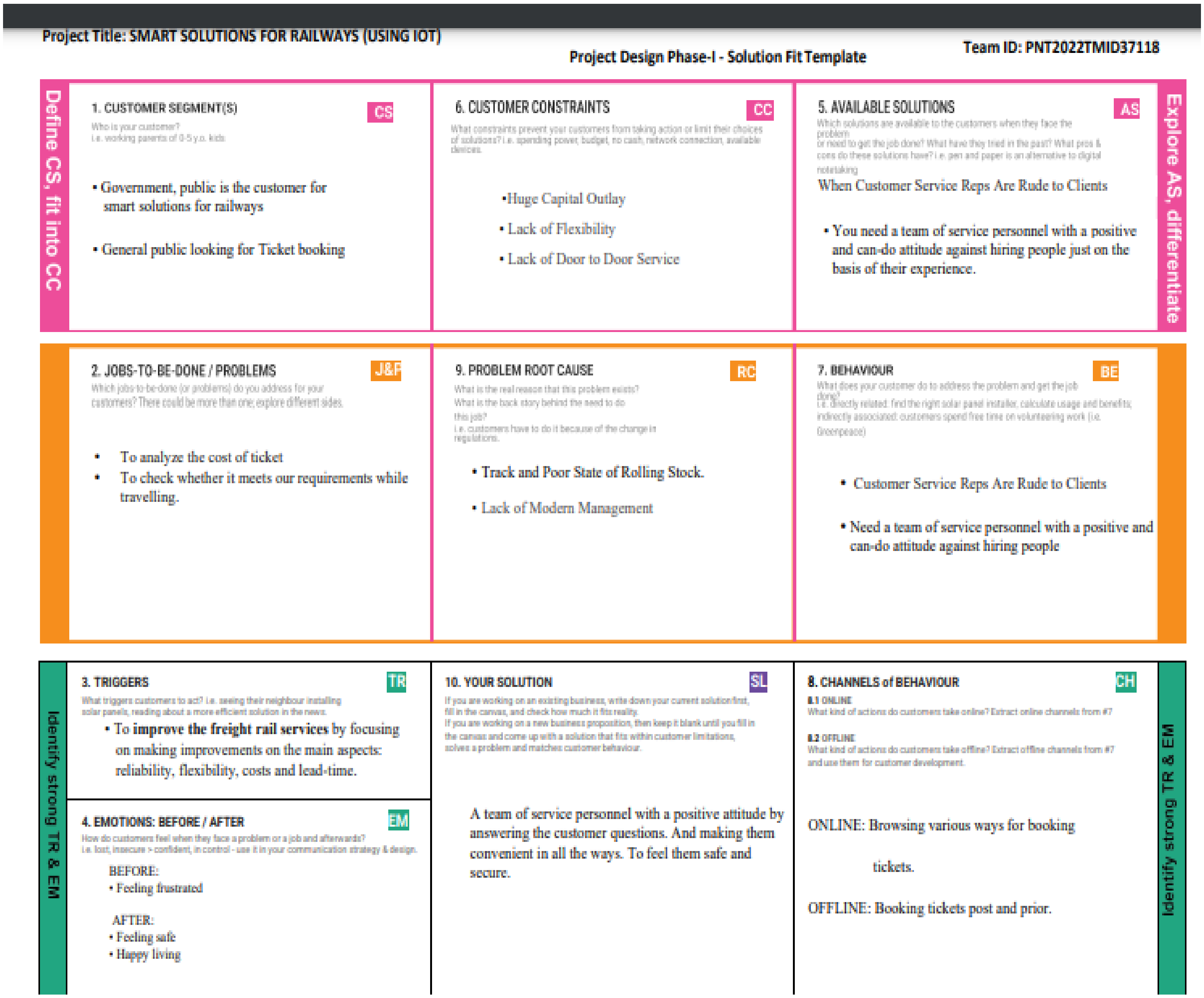
PROPOSED SOLUTION

S NO	PARAMETER	DESCRIPTION
1.	Problem Statement (Problem to be solved)	• The explosively growing demand of internet of things (IoT) has rendered broadscale advancements in the fields across sensors, radio access, network, and hardware/software platforms for mass market applications.
2.	Idea / Solution description	• GPS facility is used for validation of the ticket at the source and deletion at the destination. • Smart sensors and analytics across the train engine,coaches,and tracks allow rail systems to be remotely checked and repaired before a small issue magnifies into huge trouble. • The operating cost involved in loading,transporting and unloading material from mining and other industries continue to rise as road travel is often prone to delays,especially for hauling heavy material. • Railway transport can be cost effective.rail has lower fuel costs compare to road transport.
3.	Novelty / Uniqueness	• The main uniqueness is ticket should be check using scanning ,this should be advance technology use in the system

4.	Social Impact / Customer Satisfaction	● Polish startup REDS develop software solutions to support railway operators to increase their safety,punctality,and energy efficiency. ● Railways encouraged people to travel further and this meant people could move to different area to find work ● The railways made india mobile and opened up new vistas and opportunities for its people.
5.	Business Model (Revenue Model)	● Smart sensors can be used to track important assets,manage passenger flow,and enable predictive maintenance.
6.	Scalability of the Solution	● The IoT technology has been heavily used in railway applications, including railway operations, management, maintenance, video surveillance systems, and train control systems



Project Title: SMART SOLUTIONS FOR RAILWAYS (USING IOT)

Project Design Phase-I - Solution Fit Template

Team ID: PNT2022TMID37118

Define CS, fit into CC

1. CUSTOMER SEGMENT(S) CS

Who is your customer?
i.e. working parents of 0-5 y.o. kids

- Government, public is the customer for smart solutions for railways
- General public looking for Ticket booking

6. CUSTOMER CONSTRAINTS 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.

- Huge Capital Outlay
- Lack of Flexibility
- Lack of Door to Door Service

5. AVAILABLE SOLUTIONS AS

Which solutions are available to the customers when they face the problem
or need to get the job done? What have they tried in the past? What pros & cons do these solutions have? i.e. pen and paper is an alternative to digital notetaking

When Customer Service Reps Are Rude to Clients

- You need a team of service personnel with a positive and can-do attitude against hiring people just on the basis of their experience.

Explore AS, differentiate

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; explore different sides.

- To analyze the cost of ticket
- To check whether it meets our requirements while travelling.

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?
i.e. customers have to do it because of the change in regulations.

- Track and Poor State of Rolling Stock.
- Lack of Modern Management

7. BEHAVIOUR BE

What does your customer do to address the problem and get the job done?
i.e. directly related: find the right solar panel installer, calculate usage and benefits; indirectly associated: customers spend free time on volunteering work (i.e. Greenpeace)

- Customer Service Reps Are Rude to Clients
- Need a team of service personnel with a positive and can-do attitude against hiring people

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.

- To **improve the freight rail services** by focusing on making improvements on the main aspects: reliability, flexibility, costs and lead-time.

4. EMOTIONS: BEFORE / AFTER EM

How do customers feel when they face a problem or a job and afterwards?
i.e. lost, insecure > confident, in control - use it in your communication strategy & design.

BEFORE:
- Feeling frustrated

AFTER:
- Feeling safe
- Happy living

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 in the canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behaviour.

A team of service personnel with a positive attitude by answering the customer questions. And making them convenient in all the ways. To feel them safe and secure.

8. CHANNELS of BEHAVIOUR CH

8.1 ONLINE
What kind of actions do customers take online? Extract online channels from #7

8.2 OFFLINE
What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development.

ONLINE: Browsing various ways for booking tickets.

OFFLINE: Booking tickets post and prior.

Identify strong TR & EM

REQUIREMENT ANALYSIS

4.REQUIREMENT ANALYSIS

FUNCTIONAL REQUIREMENTS

FR No.	Functional Requirement(Epic)	Sub Requirement (Story / Sub-Task)
FR-1	**User Registration**	● Registration through Form ● Registration through Gmail ● Registration through LinkedIN
FR-2	**User Confirmation**	● Confirmation via Email ● Confirmation via OTP
FR-3	**Capturing type**	● It is captured in the use case ● Easy to capture
FR-4	**Specific Requirements**	● Database Requirements ● Functional Requirements ● System attributes
FR-5	**Functional requirements**	● **Train details**: customer may view the train timing at a date their name and number oftickets. ● **Reservation**:After checking the number of seats available the customer reserve the tickets. ● **Billing**:After reserving the required amount of tickets,customer paid the amount. ● **Cancellation**:If the customer want to cancel the ticket,then half of the amount paid by the customer will ● Be refund to him. ● **Performance Requirements**:It is available during all 24 hours.
FR-6	**Software System Attributes**	● Reliable ● Available ● Secure

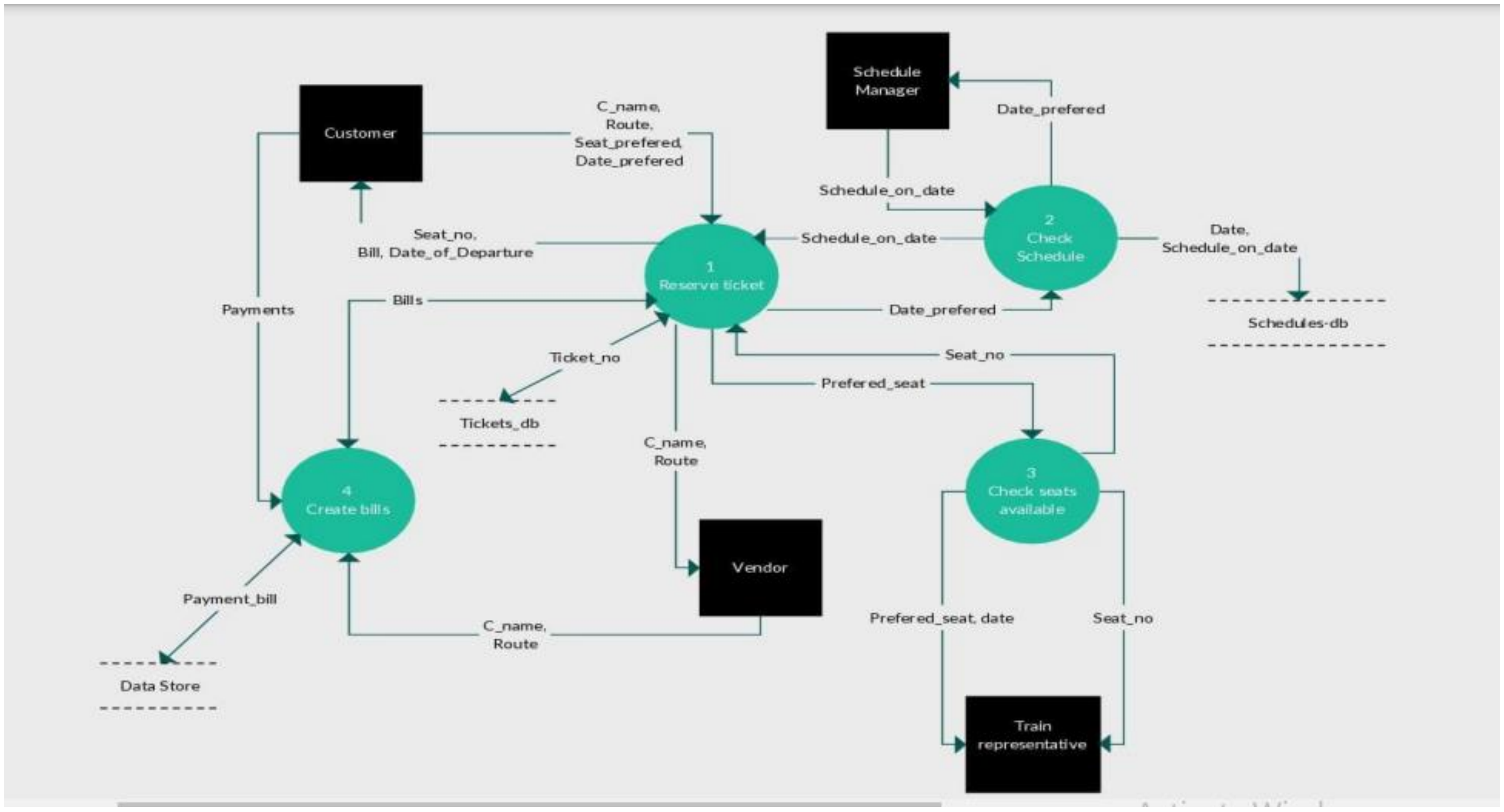
NON-FUNCTIONAL REQUIREMENTS

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	● IOT technologies help railways successfully manage passenger safety,operational efficiency,and the passenger experience.
NFR-2	**Security**	● Smart sensors can be used to track important assets,manage passenger flow ,andenable predictive maintenance .
NFR-3	**Reliability**	● QR codes are very reliable,once a qr code is generated or printed it will not degenerate or loss the data in holds ● It is only if the image becomes corrupt the data can be lost
NFR-4	**Performance**	● This system helps in increasing the overall performance of the railway reservation functionality by shifting a large chunk of load online causing in less hassle in ticket booking,cancellation. ● This system is 22 hours live per day giving us greater availability time as comapred to that of 9 hours offline activity.
NFR-5	**Availability**	● The sytem should be available at all times ,meaning the user can access it using a web browser ,only restricted by the down time of the server on which the system runs. ● The availability and booking of ticket after preparation of the final chart,which is done 3 hours to 12 hours before the departure. ● The IR sensor is used to check the seat availability.
NFR-6	**Scalability**	● The code and supporting modules of the system will be well documented and easy to understand ● Online user documentation and help system requirements.

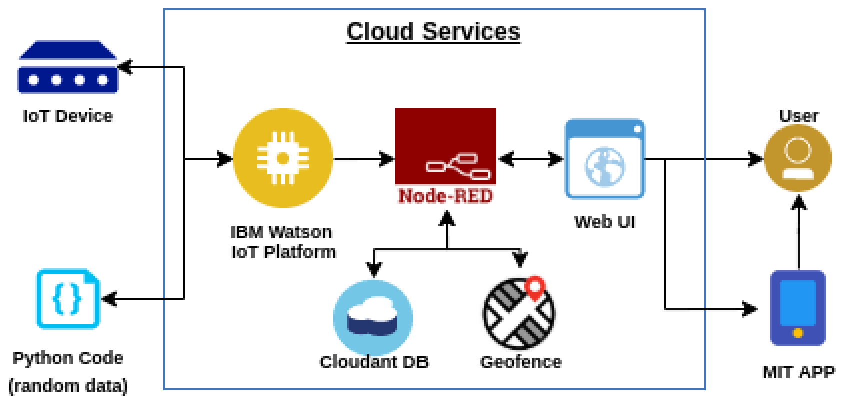
PROJECT DESIGN

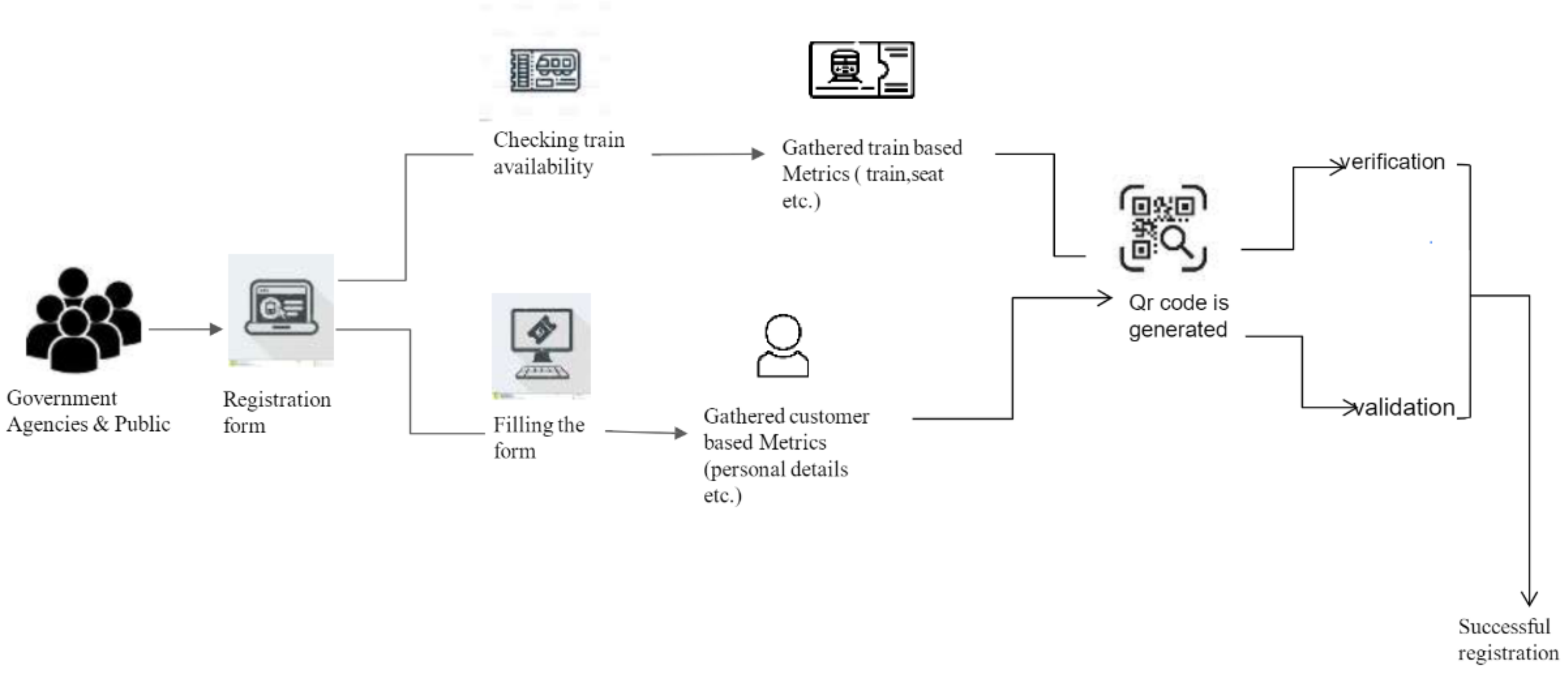
5.PROJECT DESIGN

DATA FLOW DIAGRAMS



SOLUTION & TECHNICAL ARCHITECTURE





USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user, Web user)	Registration	USN-1	As a user, I can register through the form by Filling in my details	I can register and create my account / dashboard	High	Sprint-1
		USN-2	As a user, I can register through phone numbers, Gmail, Facebook or other social sites	I can register & create my dashboard with Facebook login or other social sites	High	Sprint-2
	Conformation	USN-3	As a user, I will receive confirmation through email or OTP once registration is successful	I can receive confirmation email & click confirm.	High	Sprint-1
	Authentication/Login	USN-4	As a user, I can login via login id and password or through OTP received on register phone number	I can login and access my account/dashboard	High	Sprint-1
	Display Train details	USN-5	As a user, I can enter the start and destination to get the list of trains available connecting the above	I can view the train details (name & number), corresponding routes it passes through based on the start and destination entered.	High	Sprint-1
	Booking	USN-6	As a use, I can provide the basic details such as a name, age, gender etc…	I will view, modify or confirm the details enter.	High	Sprint-1
		USN-7	As a user, I can choose the class, seat/berth. If a preferred seat/berth isn't available I can be allocated based on the availability.	I will view, modify or confirm the seat/class berth selected	High	Sprint-1
	Payment	USN-8	As a user, I can choose to pay through credit Card/debit card/UPI.	I can view the payment Options available and select my desirable choice To proceed with the payment	High	Sprint-1
		USN-9	As a user, I will be redirected to the selected Payment gateway and upon successful	I can pay through the payment portal and confirm the booking if any changes need to	High	Sprint-1

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
			completion of payment I'll be redirected to the booking website.	be done I can move back to the initial payment page		
	Ticket generation	USN-10	As a user, I can download the generated e-ticket for my journey along with the QR code which is used for authentication during my journey.	I can show the generated QR code so that authentication can be done quickly.	High	Sprint-1
	Ticket status	USN-11	As a user, I can see the status of my ticket Whether it's confirmed/waiting/RAC.	I can confidentially get the Information and arrange alternate transport if the ticket isn't Confirmed	High	Sprint-1
	Remainders notification	USN-12	As a user, I get remainders about my journey A day before my actual journey.	I can make sure that I don't miss the journey because of the constant notifications.	Medium	Sprint-2
		USN-13	As a user, I can track the train using GPS and can get information such as ETA, Current stop and delay.	I can track the train and get to know about the delays pian accordingly	Medium	Sprint-2
	Ticket cancellation	USN-14	As a user, I can cancel my tickets if there's any Change of plan	I can cancel the ticket and get a refund based on how close the date is to the journey.	High	Sprint-1
	Raise queries	USN-15	As a user, I can raise queries through the query box or via mail.	I can view my pervious queries.	Low	Sprint-2
Customer care Executive	Answer the queries	USN-16	As a user, I will answer the questions/doubts Raised by the customers.	I can view the queries and make it once resolved	Medium	Sprint-2
Administrator	Feed details	USN-17	As a user, I will feed information about the trains delays and add extra seats if a new compartment is added.	I can view and ensure the corrections of the information fed.	High	Sprint-1

PROJECT PLANNING AND SCHEDULING

6.PROJECT PLANNING AND SCHEDULING

SPRINT PLANNING& 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 through the form by Filling in my details	2	High	P.Charulatha
Sprint-1		USN-2	As a user, I can register through phone numbers, Gmail, Facebook or other social sites	1	High	R.Dharshini
Sprint-1	Conformation	USN-3	As a user, I will receive confirmation through email or OTP once registration is successful	2	Low	J.Hasna Alfiya fathima
Sprint-1	login	USN-4	As a user, I can login via login id and password or through OTP received on register phonenumber	2	Medium	Digala Padmaja
Sprint-1	Display Train details	USN-5	As a user, I can enter the start and destination to get the list of trains available connecting the above	1	High	P.Charulatha
Sprint-2	Booking	USN-6	As a use, I can provide the basic details such as a name, age, gender etc…	2	High	R.Dharshini
Sprint-2		USN-7	As a user, I can choose the class, seat/berth. If apreferred seat/berth isn't available I can be allocated based on the availability	1	Low	J.Hasna Alfiya Fathima
Sprint-2	Payment	USN-8	As a user, I can choose to pay through credit Card/debit card/UPI.	1	High	Digala Padmaja
Sprint-2		USN-9	As a user, I will be redirected to the selected	2	High	P.Charulatha
Sprint-3	Ticket generation	USN-10	As a user, I can download the generated e- ticket for my journey along with the QR code which is used for authentication during my journey.	1	High	R.Dharshini
Sprint-3	Ticket status	USN-11	As a user, I can see the status of my ticket	2	High	J.Hasna Alfiya Fathima

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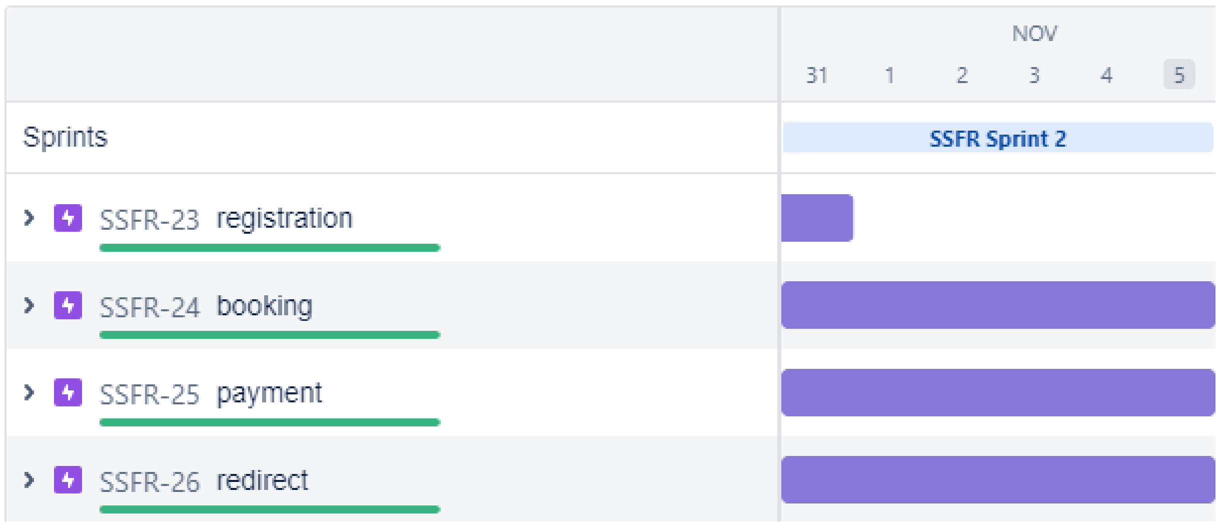
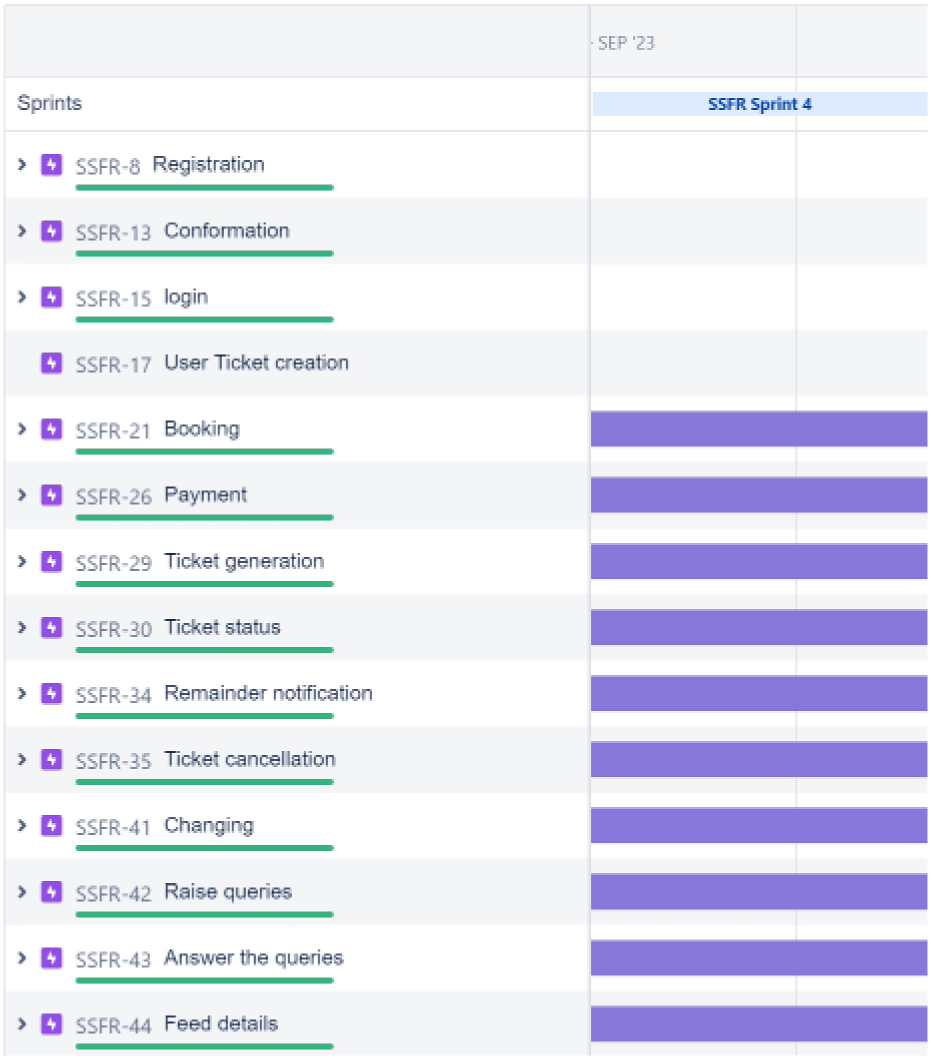
SPRINT DELIVERY SCHEDULE

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	19 Nov 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	19 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	19 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov2022

REPORTS FROM JIRA





	SEP '23
Sprints	SSFR Sprint 4
SSFR-8 Registration	
SSFR-13 Conformation	
SSFR-15 login	
SSFR-17 User Ticket creation	
SSFR-21 Booking	
SSFR-26 Payment	
SSFR-29 Ticket generation	
SSFR-30 Ticket status	
SSFR-34 Remainder notification	
SSFR-35 Ticket cancellation	
SSFR-41 Changing	
SSFR-42 Raise queries	
SSFR-43 Answer the queries	
SSFR-44 Feed details	

CODING AND SOLUTIONING

7.CODING AND SOLUTIONING

FEATURE 1

- IOT device
- IBM Watson platform
- Node red
- Cloudant DB
- Web UI
- Geofence
- MIT App
- Python code

FEATURE 2

- Registration
- Login
- Verification
- Ticket Booking
- Payment
- Ticket Cancellation
- Adding Queries

```
labl_0 = Label(base, text="Registration form",width=20,font=("bold",
20))
labl_0.place(x=90,y=53)`


lb1= Label(base, text="Enter Name", width=10, font=("arial",12))
lb1.place(x=20, y=120)
en1= Entry(base)
en1.place(x=200, y=120)

lb3= Label(base, text="Enter Email", width=10, font=("arial",12))
lb3.place(x=19, y=160)
en3= Entry(base)
en3.place(x=200, y=160)

lb4= Label(base, text="Contact Number", width=13,font=("arial",12))
lb4.place(x=19, y=200)
en4= Entry(base)
en4.place(x=200, y=200)

lb5= Label(base, text="Select Gender", width=15, font=("arial",12))
lb5.place(x=5, y=240)
var = IntVar()

Radiobutton(base, text="Male", padx=5,variable=var,
value=1).place(x=180, y=240)

Radiobutton(base, text="Female", padx =10,variable=var,
value=2).place(x=240,y=240)
```

```
Radiobutton(base, text="others", padx=15, variable=var,
value=3).place(x=310,y=240)

list_of_cntry = ("United States", "India", "Nepal", "Germany")
cv = StringVar()
drplist= OptionMenu(base, cv, *list_of_cntry)
drplist.config(width=15)
cv.set("United States")
lb2= Label(base, text="Select Country", width=13,font=("arial",12))
lb2.place(x=14,y=280)
drplist.place(x=200, y=275)

lb6= Label(base, text="Enter Password", width=13,font=("arial",12))
lb6.place(x=19, y=320)
en6= Entry(base, show='*')
en6.place(x=200, y=320)

lb7= Label(base, text="Re-Enter Password",
width=15,font=("arial",12))
lb7.place(x=21, y=360)
en7 =Entry(base, show='*')
en7.place(x=200, y=360)

Button(base, text="Register", width=10).place(x=200,y=400)
base.mainloop()
```

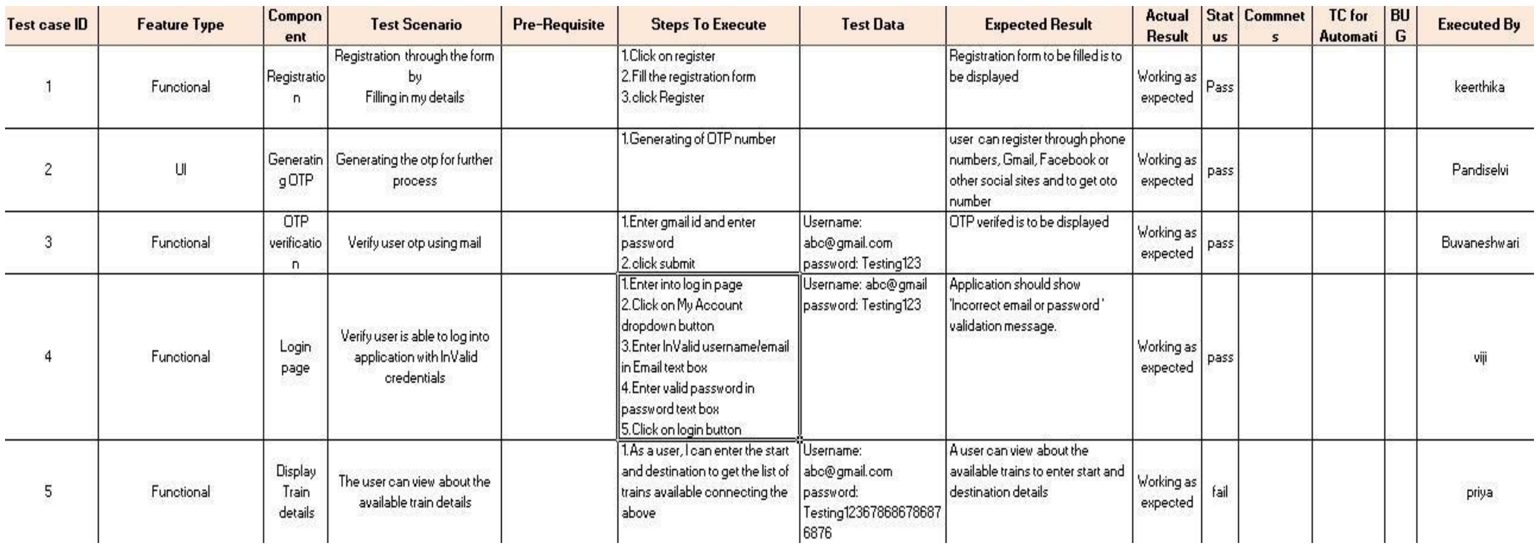
```
def generateOTP() :

    # Declare a digits variable
    # which stores all digits
    digits = "0123456789"
    OTP = ""

   # length of password can be changed
   # by changing value in range
    for i in range(4) :
        OTP += digits[math.floor(random.random() * 10)]

    return OTP

# Driver code
if __name__ == "__main__" :

    print("OTP of 4 digits:", generateOTP())

digits="0123456789"
OTP=""
for i in range(6):
    OTP+=digits[math.floor(random.random()*10)]
otp = OTP + " is your OTP"
msg= otp
s = smtplib.SMTP('smtp.gmail.com', 587)
s.starttls()
s.login("Your Gmail Account", "You app password")
emailid = input("Enter your email: ")
```

```
s.sendmail('&&&&&&&&&&&&',emailid,msg)
a = input("Enter Your OTP >>: ")
if a == OTP:
   print("Verified")
else:
   print("Please Check your OTP again")
roo
```

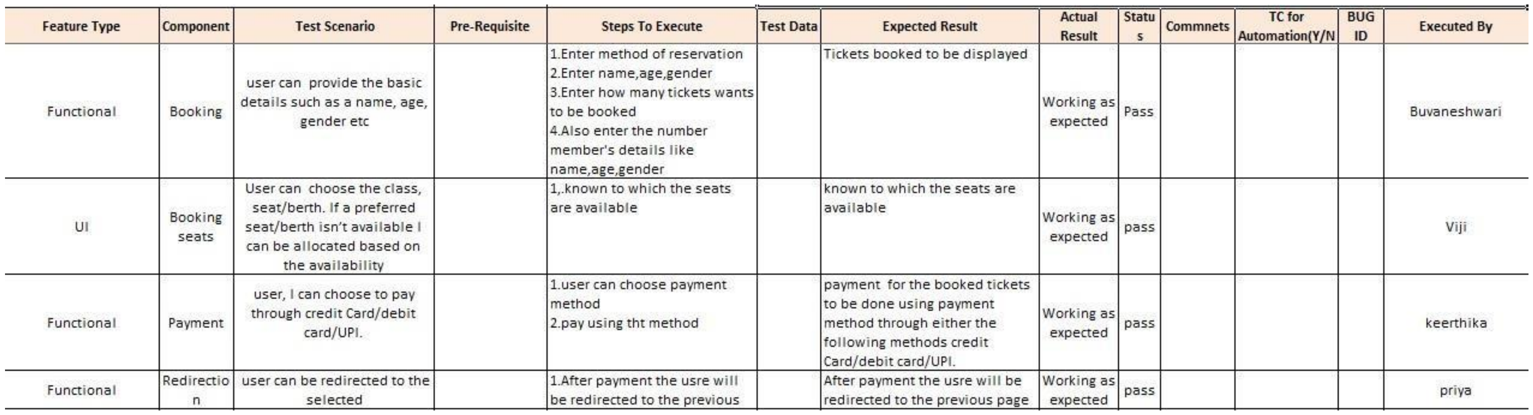
TESTING

8. TESTING

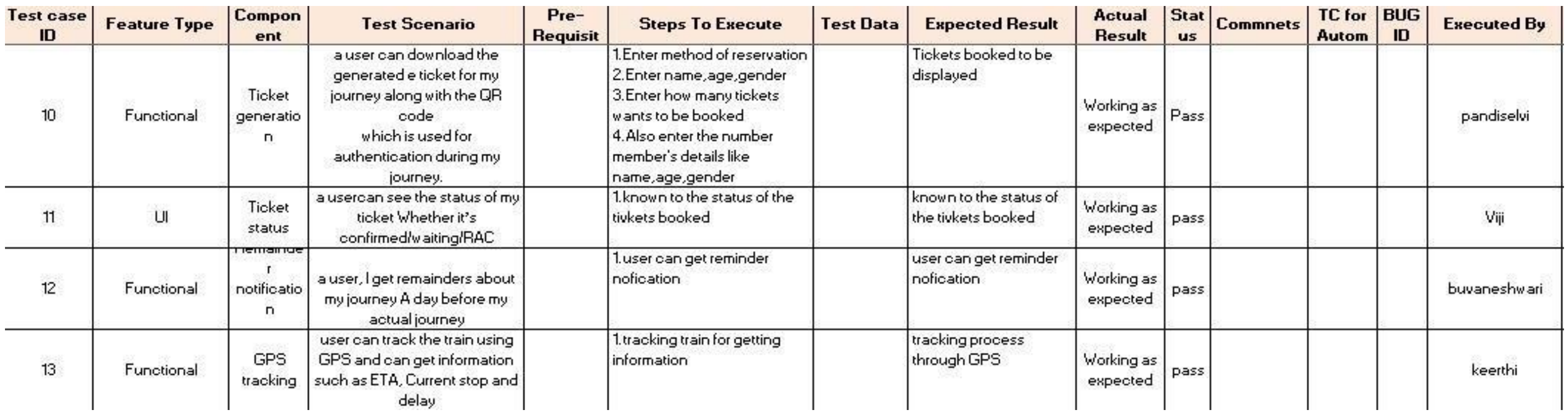
8.1.TEST CASES



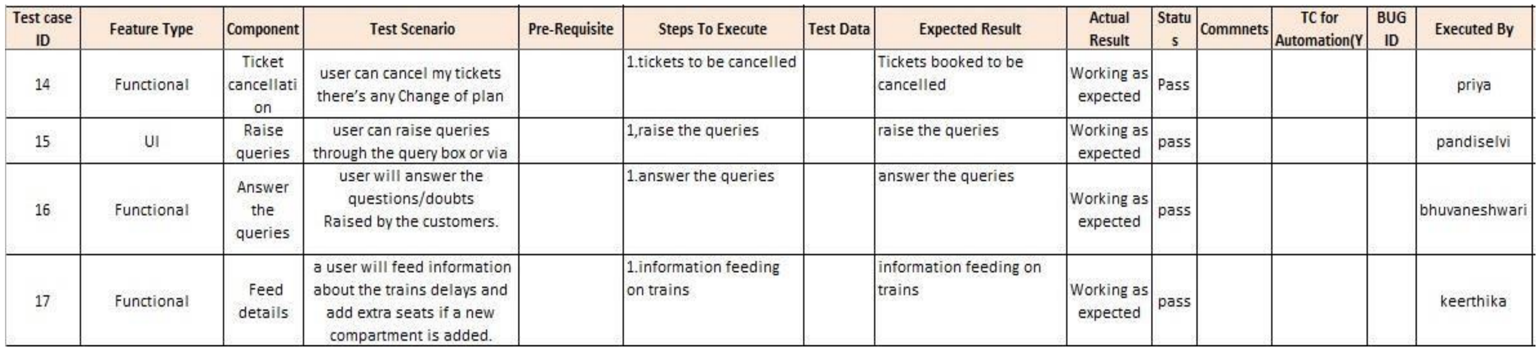
Test case ID	Feature Type	Component	Test Scenario	Pre-Requisite	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Commnets	TC for Automati	BUG	Executed By
1	Functional	Registration	Registration through the form by Filling in my details		1.Click on register 2.Fill the registration form 3.click Register		Registration form to be filled is to be displayed	Working as expected	Pass				keerthika
2	UI	Generating OTP	Generating the otp for further process		1.Generating of OTP number		user can register through phone numbers, Gmail, Facebook or other social sites and to get oto number	Working as expected	pass				Pandiselvi
3	Functional	OTP verification	Verify user otp using mail		1.Enter gmail id and enter password 2.click submit	Username: abc@gmail.com password: Testing123	OTP verifed is to be displayed	Working as expected	pass				Buvaneshwari
4	Functional	Login page	Verify user is able to log into application with InValid credentials		1.Enter into log in page 2.Click on My Account dropdown button 3.Enter InValid username/email in Email text box 4.Enter valid password in password text box 5.Click on login button	Username: abc@gmail password: Testing123	Application should show 'Incorrect email or password ' validation message.	Working as expected	pass				viji
5	Functional	Display Train details	The user can view about the available train details		1.As a user, I can enter the start and destination to get the list of trains available connecting the above	Username: abc@gmail.com password: Testing123678686786876876	A user can view about the available trains to enter start and destination details	Working as expected	fail				priya



Feature Type	Component	Test Scenario	Pre-Requisite	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Commnets	TC for Automation(Y/N	BUG ID	Executed By
Functional	Booking	user can provide the basic details such as a name, age, gender etc		1.Enter method of reservation 2.Enter name,age,gender 3.Enter how many tickets wants to be booked 4.Also enter the number member's details like name,age,gender		Tickets booked to be displayed	Working as expected	Pass				Buvaneshwari
UI	Booking seats	User can choose the class, seat/berth. If a preferred seat/berth isn't available I can be allocated based on the availability		1,.known to which the seats are available		known to which the seats are available	Working as expected	pass				Viji
Functional	Payment	user, I can choose to pay through credit Card/debit card/UPI.		1.user can choose payment method 2.pay using tht method		payment for the booked tickets to be done using payment method through either the following methods credit Card/debit card/UPI.	Working as expected	pass				keerthika
Functional	Redirection	user can be redirected to the selected		1.After payment the usre will be redirected to the previous		After payment the usre will be redirected to the previous page	Working as expected	pass				priya



Test case ID	Feature Type	Component	Test Scenario	Pre-Requisit	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Commnets	TC for Autom	BUG ID	Executed By
10	Functional	Ticket generation	a user can download the generated e ticket for my journey along with the QR code which is used for authentication during my journey.		1.Enter method of reservation 2.Enter name,age,gender 3.Enter how many tickets wants to be booked 4.Also enter the number member's details like name,age,gender		Tickets booked to be displayed	Working as expected	Pass				pandiselvi
11	UI	Ticket status	a usercan see the status of my ticket Whether it's confirmed/waiting/RAC		1.known to the status of the tivkets booked		known to the status of the tivkets booked	Working as expected	pass				Viji
12	Functional	Remainder notification	a user, I get remainders about my journey A day before my actual journey		1.user can get reminder nofication		user can get reminder nofication	Working as expected	pass				buvaneshwari
13	Functional	GPS tracking	user can track the train using GPS and can get information such as ETA, Current stop and delay		1.tracking train for getting information		tracking process through GPS	Working as expected	pass				keerthi

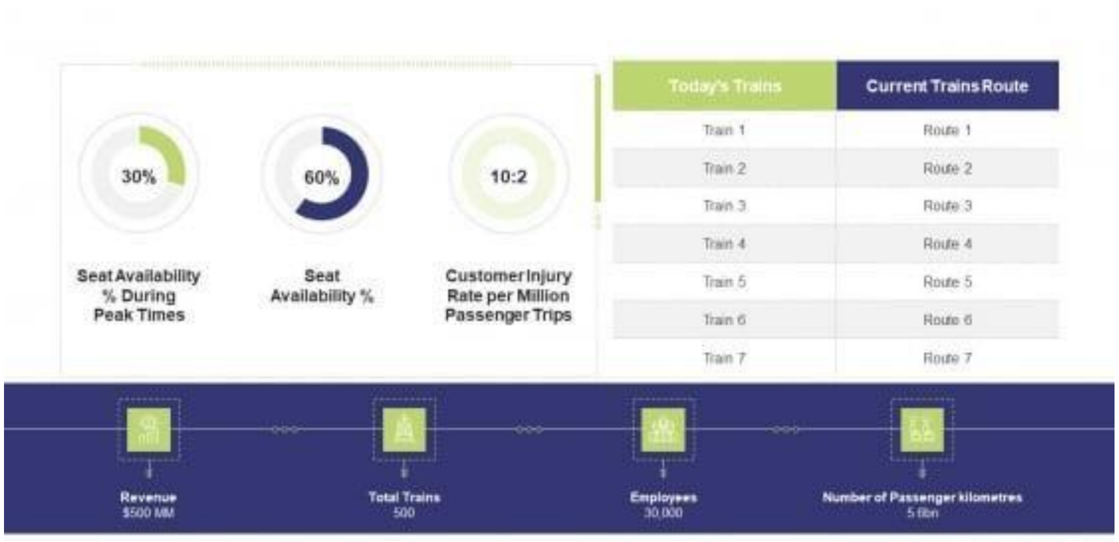


Test case ID	Feature Type	Component	Test Scenario	Pre-Requisite	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Commnets	TC for Automation(Y	BUG ID	Executed By
14	Functional	Ticket cancellation	user can cancel my tickets there's any Change of plan		1.tickets to be cancelled		Tickets booked to be cancelled	Working as expected	Pass				priya
15	UI	Raise queries	user can raise queries through the query box or via		1,raise the queries		raise the queries	Working as expected	pass				pandiselvi
16	Functional	Answer the queries	user will answer the questions/doubts Raised by the customers.		1.answer the queries		answer the queries	Working as expected	pass				bhuvaneshwari
17	Functional	Feed details	a user will feed information about the trains delays and add extra seats if a new compartment is added.		1.information feeding on trains		information feeding on trains	Working as expected	pass				keerthika

RESULTS

9. RESULTS

PERFORMANCE METRICS



Today's Trains	Current Trains Route
Train 1	Route 1
Train 2	Route 2
Train 3	Route 3
Train 4	Route 4
Train 5	Route 5
Train 6	Route 6
Train 7	Route 7

ADVANTAGES &DISADVANTAGES

10. ADVANTAGES &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, leading to better performance and lower operation costs.

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.

CONCLUSION

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.

FUTURE SCOPE

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

APPENDIX

13. APPENDIX

SOURCE PROGRAM

```
from tkinter import*
base = Tk()
base.geometry("500x500")
base.title("registration form")

labl_0 = Label(base, text="Registration form",width=20,font=("bold", 20))
labl_0.place(x=90,y=53)

lb1= Label(base, text="Enter Name", width=10, font=("arial",12))
lb1.place(x=20, y=120)
en1= Entry(base)
en1.place(x=200, y=120)

lb3= Label(base, text="Enter Email", width=10, font=("arial",12))
lb3.place(x=19, y=160)
en3= Entry(base)
en3.place(x=200, y=160)

lb4= Label(base, text="Contact Number", width=13,font=("arial",12))
lb4.place(x=19, y=200)
en4= Entry(base)
en4.place(x=200, y=200)

lb5= Label(base, text="Select Gender", width=15, font=("arial",12))
lb5.place(x=5, y=240)
var = IntVar()
Radiobutton(base, text="Male", padx=5,variable=var, value=1).place(x=180, y=240)
Radiobutton(base, text="Female", padx =10,variable=var, value=2).place(x=240,y=240)
Radiobutton(base, text="others", padx=15, variable=var, value=3).place(x=310,y=240)

list_of_cntry = ("United States", "India", "Nepal", "Germany")
cv = StringVar()
drplist= OptionMenu(base, cv, *list_of_cntry)
drplist.config(width=15)
cv.set("United States")
lb2= Label(base, text="Select Country", width=13,font=("arial",12))
lb2.place(x=14,y=280)
drplist.place(x=200, y=275)

lb6= Label(base, text="Enter Password", width=13,font=("arial",12))
lb6.place(x=19, y=320)
en6= Entry(base, show='*')
en6.place(x=200, y=320)

lb7= Label(base, text="Re-Enter Password", width=15,font=("arial",12))
lb7.place(x=21, y=360)
en7 =Entry(base, show='*')
en7.place(x=200, y=360)

Button(base, text="Register", width=10).place(x=200,y=400)
```

```
base.mainloop()
# import library
import math, random

# function to generate OTP
def generateOTP() :

    # Declare a digits variable
    # which stores all digits
    digits = "0123456789"
    OTP = ""

   # length of password can be changed
   # by changing value in range
    for i in range(4) :
        OTP += digits[math.floor(random.random() * 10)]

    return OTP

# Driver code
if __name__ == "__main__" :

    print("OTP of 4 digits:", generateOTP())
import os
import math
import random
import smtplib

digits = "0123456789"
OTP = ""

for i in range (6):
    OTP += digits[math.floor(random.random()*10)]

otp = OTP + " is your OTP"
message = otp
s = smtplib.SMTP('smtp.gmail.com', 587)
s.starttls()

emailid = input("Enter your email: ")
s.login("YOUR Gmail ID", "YOUR APP PASSWORD")
s.sendmail('&&&&&&',emailid,message)

a = input("Enter your OTP >>: ")
if a == OTP:
    print("Verified")
else:
    print("Please Check your OTP again")
from tkinter import *
import sqlite3

root = Tk()
root.title("Python: Simple Login Application")
width = 400
height = 280
screen_width = root.winfo_screenwidth()
```

```
screen_height = root.winfo_screenheight()
x = (screen_width/2) - (width/2)
y = (screen_height/2) - (height/2)
root.geometry("%dx%d+%d+%d" % (width, height, x, y))
root.resizable(0, 0)

#==============================VARIABLES======================================
USERNAME = StringVar()
PASSWORD = StringVar()

#==============================FRAMES=========================================
Top = Frame(root, bd=2,  relief=RIDGE)
Top.pack(side=TOP, fill=X)
Form = Frame(root, height=200)
Form.pack(side=TOP, pady=20)

#==============================LABELS=========================================
lbl_title = Label(Top, text = "Python: Simple Login Application", font=('arial', 15))
lbl_title.pack(fill=X)
lbl_username = Label(Form, text = "Username:", font=('arial', 14), bd=15)
lbl_username.grid(row=0, sticky="e")
lbl_password = Label(Form, text = "Password:", font=('arial', 14), bd=15)
lbl_password.grid(row=1, sticky="e")
lbl_text = Label(Form)
lbl_text.grid(row=2, columnspan=2)

#==============================ENTRY WIDGETS==================================
username = Entry(Form, textvariable=USERNAME, font=(14))
username.grid(row=0, column=1)
password = Entry(Form, textvariable=PASSWORD, show="*", font=(14))
password.grid(row=1, column=1)




#==============================METHODS========================================
def Database():
    global conn, cursor
    conn = sqlite3.connect("pythontut.db")
    cursor = conn.cursor()
    cursor.execute("CREATE TABLE IF NOT EXISTS `member` (mem_id INTEGER NOT NULL PRIMARY KEY  AUTOINCREMENT, username TEXT, password TEXT)")
    cursor.execute("SELECT * FROM `member` WHERE `username` = 'admin' AND `password` = 'admin'")
    if cursor.fetchone() is None:
        cursor.execute("INSERT INTO `member` (username, password) VALUES('admin', 'admin')")
        conn.commit()
def Login(event=None):
    Database()
    if USERNAME.get() == "" or PASSWORD.get() == "":
        lbl_text.config(text="Please complete the required field!", fg="red")
    else:
        cursor.execute("SELECT * FROM `member` WHERE `username` = ? AND `password` = ?", (USERNAME.get(), PASSWORD.get()))
        if cursor.fetchone() is not None:
            HomeWindow()
            USERNAME.set("")
            PASSWORD.set("")
            lbl_text.config(text="")
        else:
            lbl_text.config(text="Invalid username or password", fg="red")
            USERNAME.set("")
            PASSWORD.set("")
    cursor.close()
    conn.close()


#==============================BUTTON WIDGETS=================================
btn_login = Button(Form, text="Login", width=45, command=Login)
btn_login.grid(pady=25, row=3, columnspan=2)
btn_login.bind('<Return>', Login)


def HomeWindow():
    global Home
    root.withdraw()
    Home = Toplevel()
    Home.title("Python: Simple Login Application")
    width = 600
    height = 500
    screen_width = root.winfo_screenwidth()
    screen_height = root.winfo_screenheight()
    x = (screen_width/2) - (width/2)
    y = (screen_height/2) - (height/2)
    root.resizable(0, 0)
    Home.geometry("%dx%d+%d+%d" % (width, height, x, y))
    lbl_home = Label(Home, text="Successfully Login!", font=('times new roman', 
20)).pack()
    btn_back = Button(Home, text='Back', command=Back).pack(pady=20, fill=X)

def Back():
    Home.destroy()
    root.deiconify()
# import module
import requests
from bs4 import BeautifulSoup

# user define function
# Scrape the data
def getdata(url):
    r = requests.get(url)
    return r.text


# input by geek
from_Station_code = "GAYA"
from_Station_name = "GAYA"

To_station_code = "PNBE"
To_station_name = "PATNA"
# url
```

```
url = "https://www.railyatri.in/booking/trains-between-stations?from_code="+from_Station_code+"&from_name="+from_Station_name+"+JN+&journey_date=+Wed&src=tbs&to_code=" + \
    To_station_code+"&to_name="+To_station_name + \
    "+JN+&user_id=-1603228437&user_token=355740&utm_source=dwebsearch_tbs_search_trains"

# pass the url
# into getdata function
htmldata = getdata(url)
soup = BeautifulSoup(htmldata, 'html.parser')

# find the Html tag
# with find()
# and convert into string
data_str = ""
for item in soup.find_all("div", class_="col-xs-12 TrainSearchSection"):
    data_str = data_str + item.get_text()
result = data_str.split("\n")

print("Train between "+from_Station_name+" and "+To_station_name)
print("")

# Display the result
for item in result:
    if item != "":
        print(item)
print("\n\nTicket Booking System\n")
restart = ('Y')

while restart != ('N','NO','n','no'):
     print("1.Check PNR status")
     print("2.Ticket Reservation")
     option = int(input("\nEnter your option : "))

     if option == 1:
           print("Your PNR status is t3")
           exit(0)

     elif option == 2:
           people = int(input("\nEnter no. of Ticket you want : "))
           name_l = []
           age_l = []
           sex_l = []
           for p in range(people):
                 name = str(input("\nName : "))
                 name_l.append(name)
                 age  = int(input("\nAge  : "))
                 age_l.append(age)
                 sex  = str(input("\nMale or Female : "))
                 sex_l.append(sex)

           restart = str(input("\nDid you forgot someone? y/n: "))
           if restart in ('y','YES','yes','Yes'):
                 restart = ('Y')
           else :
                 x = 0
                 print("\nTotal Ticket : ",people)
                 for p in range(1,people+1):
                      print("Ticket : ",p)
                      print("Name : ", name_l[x])
                      print("Age  : ", age_l[x])
                      print("Sex : ",sex_l[x])
                      x += 1
 def berth_type(s):

     if s>0 and s<73:
         if s % 8 == 1 or s % 8 == 4:
             print (s), "is lower berth"
         elif s % 8 == 2 or s % 8 == 5:
             print (s), "is middle berth"
         elif s % 8 == 3 or s % 8 == 6:
             print (s), "is upper berth"
         elif s % 8 == 7:
             print (s), "is side lower berth"
         else:
             print (s), "is side upper berth"
     else:
         print (s), "invalid seat number"

 # Driver code
 s = 10
 berth_type(s)      # fxn call for berth type

 s = 7
 berth_type(s)     # fxn call for berth type

 s = 0
 berth_type(s)      # fxn call for berth type
 from django.contrib.auth.base_user import AbstractBaseUser
 from django.db import models


 class User(AbstractBaseUser):
     """
     User model.
     """

     USERNAME_FIELD = "email"

     REQUIRED_FIELDS = ["first_name", "last_name"]

     email = models.EmailField(
         verbose_name="E-mail",
         unique=True
     )

     first_name = models.CharField(
         verbose_name="First name",
         max_length=30
     )

     last_name = models.CharField(
         verbose_name="Last name",
         max_length=40
     )

     city = models.CharField(
         verbose_name="City",
         max_length=40
     )

     stripe_id = models.CharField(
         verbose_name="Stripe ID",
         unique=True,
         max_length=50,
         blank=True,
         null=True
     )

     objects = UserManager()

     @property
     def get_full_name(self):
         return f"{self.first_name} {self.last_name}"

     class Meta:
         verbose_name = "User"
         verbose_name_plural = "Users"


 class Profile(models.Model):
     """
     User's profile.
     """

     phone_number = models.CharField(
         verbose_name="Phone number",
         max_length=15
     )

     date_of_birth = models.DateField(
         verbose_name="Date of birth"
     )

     postal_code = models.CharField(
         verbose_name="Postal code",
         max_length=10,
         blank=True
     )

     address = models.CharField(
         verbose_name="Address",
         max_length=255,
         blank=True
     )

     class Meta:
         abstract = True


 class UserProfile(Profile):
     """
     User's profile model.
     """

     user = models.OneToOneField(
         to=User, on_delete=models.CASCADE, related_name="profile",
     )

     group = models.CharField(
         verbose_name="Group type",
         choices=GroupTypeChoices.choices(),
         max_length=20,
         default=GroupTypeChoices.EMPLOYEE.name,
     )

     def __str__(self):
         return self.user.email

 class Meta:

 # user 1 - employer
     user1, _ = User.objects.get_or_create(
     email="foo@bar.com",
     first_name="Employer",
     last_name="Testowy",
     city="BiaÅ‚ystok",
 )

 user1.set_unusable_password()

 group_name = "employer"

 _profile1, _ = UserProfile.objects.get_or_create(
     user=user1,
     date_of_birth=datetime.now() - timedelta(days=6600),
     group=GroupTypeChoices(group_name).name,
     address="MyÅ›liwska 14",
     postal_code="15-569",
     phone_number="+48100200300",
 )

 # user2 - employee
 user2, _ = User.objects.get_or_create(
     email="bar@foo.com",
     first_name="Employee",
     last_name="Testowy",
     city="BiaÅ‚ystok",
 )

 user2.set_unusable_password()

 group_name = "employee"
```

```

_profile2, _ = UserProfile.objects.get_or_create(
    user=user2,
    date_of_birth=datetime.now() - timedelta(days=7600),
    group=GroupTypeChoices(group_name).name,
    address="MyÅ›liwska 14",
    postal_code="15-569",
    phone_number="+48200300400",
)

response_customer = stripe.Customer.create(
    email=user.email,
    description=f"EMPLOYER - {user.get_full_name}",
    name=user.get_full_name,
    phone=user.profile.phone_number,
)

user1.stripe_id = response_customer.stripe_id
user1.save()

mcc_code, url = "1520", "https://www.softserveinc.com/"

response_ca = stripe.Account.create(
    type="custom",
    country="PL",
    email=user2.email,
    default_currency="pln",
    business_type="individual",
    settings={"payouts": {"schedule": {"interval": "manual", }}},
    requested_capabilities=["card_payments", "transfers", ],
    business_profile={"mcc": mcc_code, "url": url},
    individual={
        "first_name": user2.first_name,
        "last_name": user2.last_name,
        "email": user2.email,
        "dob": {
            "day": user2.profile.date_of_birth.day,
            "month": user2.profile.date_of_birth.month,
            "year": user2.profile.date_of_birth.year,
        },
        "phone": user2.profile.phone_number,
        "address": {
            "city": user2.city,
            "postal_code": user2.profile.postal_code,
            "country": "PL",
            "line1": user2.profile.address,
        },
    },
)

user2.stripe_id = response_ca.stripe_id
user2.save()

tos_acceptance = {"date": int(time.time()), "ip": user_ip},

stripe.Account.modify(user2.stripe_id, tos_acceptance=tos_acceptance)
```

```

passport_front = stripe.File.create(
    purpose="identity_document",
    file=_file, # ContentFile object
    stripe_account=user2.stripe_id,
)

individual = {
    "verification": {
        "document": {"front": passport_front.get("id"),},
        "additional_document": {"front": passport_front.get("id"),},
    }
}


stripe.Account.modify(user2.stripe_id, individual=individual)

new_card_source = stripe.Customer.create_source(user1.stripe_id, source=token)

stripe.SetupIntent.create(
    payment_method_types=["card"],
    customer=user1.stripe_id,
    description="some description",
    payment_method=new_card_source.id,
)

payment_method = stripe.Customer.retrieve(user1.stripe_id).default_source

payment_intent = stripe.PaymentIntent.create(
    amount=amount,
    currency="pln",
    payment_method_types=["card"],
    capture_method="manual",
    customer=user1.stripe_id, # customer
    payment_method=payment_method,
    application_fee_amount=application_fee_amount,
    transfer_data={"destination": user2.stripe_id}, # connect account
    description=description,
    metadata=metadata,
)

payment_intent_confirm = stripe.PaymentIntent.confirm(
    payment_intent.stripe_id, payment_method=payment_method
)

stripe.PaymentIntent.capture(
    payment_intent.id, amount_to_capture=amount
)
stripe.Balance.retrieve(stripe_account=user2.stripe_id)

stripe.Charge.create(
    amount=amount,
    currency="pln",
    source=user2.stripe_id,
    description=description
)
```

```
stripe.PaymentIntent.cancel(payment_intent.id)


unique_together = ("user", "group")
import logging

import attr
from flask import Blueprint, flash, redirect, request, url_for
from flask.views import MethodView
from flask_babelplus import gettext as _
from flask_login import current_user, login_required
from pluggy import HookimplMarker

@attr.s(frozen=True, cmp=False, hash=False, repr=True)
class UserSettings(MethodView):
    form = attr.ib(factory=settings_form_factory)
    settings_update_handler = attr.ib(factory=settings_update_handler)

    decorators = [login_required]

    def get(self):
        return self.render()

    def post(self):
        if self.form.validate_on_submit():
            try:
                self.settings_update_handler.apply_changeset(
                    current_user, self.form.as_change()
                )
            except StopValidation as e:
                self.form.populate_errors(e.reasons)
                return self.render()
            except PersistenceError:
                logger.exception("Error while updating user settings")
                flash(_("Error while updating user settings"), "danger")
                return self.redirect()

            flash(_("Settings updated."), "success")
            return self.redirect()
        return self.render()

    def render(self):
        return render_template("user/general_settings.html", form=self.form)

    def redirect(self):
        return redirect(url_for("user.settings"))


@attr.s(frozen=True, hash=False, cmp=False, repr=True)
class ChangePassword(MethodView):
    form = attr.ib(factory=change_password_form_factory)
    password_update_handler = attr.ib(factory=password_update_handler)
    decorators = [login_required]

    def get(self):
        return self.render()

    def post(self):
        if self.form.validate_on_submit():
            try:
                self.password_update_handler.apply_changeset(
                    current_user, self.form.as_change()
                )
            except StopValidation as e:
                self.form.populate_errors(e.reasons)
                return self.render()
            except PersistenceError:
                logger.exception("Error while changing password")
                flash(_("Error while changing password"), "danger")
                return self.redirect()

            flash(_("Password updated."), "success")
            return self.redirect()
        return self.render()

    def render(self):
        return render_template("user/change_password.html", form=self.form)

    def redirect(self):
        return redirect(url_for("user.change_password"))


@attr.s(frozen=True, cmp=False, hash=False, repr=True)
class ChangeEmail(MethodView):
    form = attr.ib(factory=change_email_form_factory)
    update_email_handler = attr.ib(factory=email_update_handler)
    decorators = [login_required]

    def get(self):
        return self.render()

    def post(self):
        if self.form.validate_on_submit():
            try:
                self.update_email_handler.apply_changeset(
                    current_user, self.form.as_change()
                )
            except StopValidation as e:
                self.form.populate_errors(e.reasons)
                return self.render()
            except PersistenceError:
                logger.exception("Error while updating email")
                flash(_("Error while updating email"), "danger")
                return self.redirect()

            flash(_("Email address updated."), "success")
            return self.redirect()
        return self.render()

    def render(self):
        return render_template("user/change_email.html", form=self.form)

    def redirect(self):
        return redirect(url_for("user.change_email"))
Footer
class Ticket:
    counter=0
    def __init__(self,passenger_name,source,destination):
        self.__passenger_name=passenger_name
        self.__source=source
        self.__destination=destination
        self.Counter=Ticket.counter
        Ticket.counter+=1
    def validate_source_destination(self):
        if (self.__source=="Delhi" and (self.__destination=="Pune" or
self.__destination=="Mumbai" or self.__destination=="Chennai" or
self.__destination=="Kolkata")):
            return True
        else:
            return False

    def generate_ticket(self ):
        if True:
            __ticket_id=self.__source[0]+self.__destination[0]+"0"+str(self.Counter)
            print( "Ticket id will be:",__ticket_id)
        else:
            return False
    def get_ticket_id(self):
        return self.ticket_id
    def get_passenger_name(self):
        return self.__passenger_name
    def get_source(self):
        if self.__source=="Delhi":
            return self.__source
        else:
            print("you have written invalid soure option")
            return None
    def get_destination(self):
        if self.__destination=="Pune":
            return self.__destination
        elif self.__destination=="Mumbai":
            return self.__destination
        elif self.__destination=="Chennai":
            return self.__destination
        elif self.__destination=="Kolkata":
            return self.__destination

        else:
            return None
# import module
import requests
from bs4 import BeautifulSoup
import pandas as pd

# user define function
# Scrape the data
def getdata(url):
    r = requests.get(url)
    return r.text

# input by geek
train_name = "03391-rajgir-new-delhi-clone-special-rgd-to-ndls"

# url
url = "https://www.railyatri.in/live-train-status/"+train_name

# pass the url
# into getdata function
htmldata = getdata(url)
soup = BeautifulSoup(htmldata, 'html.parser')

# traverse the live status from
# this Html code
data = []
for item in soup.find_all('script', type="application/ld+json"):
    data.append(item.get_text())

# convert into dataframe
df = pd.read_json(data[1])

# display this column of
# dataframe
# print(df["mainEntity"][0]['name'])
# print(df["mainEntity"][0]['acceptedAnswer']['text'])
import pyttsx3
from plyer import notification
import time


# Speak method
def Speak(audio):

    # Calling the initial constructor
    # of pyttsx3
    engine = pyttsx3.init('sapi5')

    # Calling the getter method
    voices = engine.getProperty('voices')

    # Calling the setter method
    engine.setProperty('voice', voices[1].id)

    engine.say(audio)
    engine.runAndWait()


def Take_break():

    Speak("Do you want to start sir?")
    question = input()

    if "yes" in question:
        Speak("Starting Sir")

    if "no" in question:
          Speak("We will automatically start after 5 Mins Sir.")
          time.sleep(5*60)
          Speak("Starting Sir")

    # A notification we will held that
    # Let's Start sir and with a message of
    # will tell you to take a break after 45
    # mins for 10 seconds
    while(True):
          notification.notify(title="Let's Start sir",
          message="will tell you to take a break after 45 mins",
          timeout=10)

          # For 45 min the will be no notification but
          # after 45 min a notification will pop up.
          time.sleep(0.5*60)

          Speak("Please Take a break Sir")

          notification.notify(title="Break Notification",
          message="Please do use your device after sometime as you have"
          "been continuously using it for 45 mins and it will affect your eyes",
          timeout=10)


# Driver's Code
if __name__ == '__main__':
    Take_break()


import logging

import attr
from flask import Blueprint, flash, redirect, request, url_for
from flask.views import MethodView
from flask_babelplus import gettext as _
from flask_login import current_user, login_required
from pluggy import HookimplMarker

@attr.s(frozen=True, cmp=False, hash=False, repr=True)
class UserSettings(MethodView):
    form = attr.ib(factory=settings_form_factory)
    settings_update_handler = attr.ib(factory=settings_update_handler)

    decorators = [login_required]

    def get(self):
        return self.render()

    def post(self):
        if self.form.validate_on_submit():
            try:
                self.settings_update_handler.apply_changeset(
                    current_user, self.form.as_change()
                )
            except StopValidation as e:
                self.form.populate_errors(e.reasons)
                return self.render()
            except PersistenceError:
                logger.exception("Error while updating user settings")
                flash(_("Error while updating user settings"), "danger")
                return self.redirect()

            flash(_("Settings updated."), "success")
            return self.redirect()
        return self.render()

    def render(self):
        return render_template("user/general_settings.html", form=self.form)

    def redirect(self):
        return redirect(url_for("user.settings"))


@attr.s(frozen=True, hash=False, cmp=False, repr=True)
class ChangePassword(MethodView):
    form = attr.ib(factory=change_password_form_factory)
    password_update_handler = attr.ib(factory=password_update_handler)
    decorators = [login_required]

    def get(self):
        return self.render()

    def post(self):
        if self.form.validate_on_submit():
            try:
                self.password_update_handler.apply_changeset(
                    current_user, self.form.as_change()
                )
            except StopValidation as e:
                self.form.populate_errors(e.reasons)
                return self.render()
            except PersistenceError:
                logger.exception("Error while changing password")
                flash(_("Error while changing password"), "danger")
                return self.redirect()

            flash(_("Password updated."), "success")
            return self.redirect()
        return self.render()

    def render(self):
        return render_template("user/change_password.html", form=self.form)

    def redirect(self):
        return redirect(url_for("user.change_password"))


@attr.s(frozen=True, cmp=False, hash=False, repr=True)
class ChangeEmail(MethodView):
    form = attr.ib(factory=change_email_form_factory)
    update_email_handler = attr.ib(factory=email_update_handler)
    decorators = [login_required]

    def get(self):
        return self.render()

    def post(self):
        if self.form.validate_on_submit():
            try:
                self.update_email_handler.apply_changeset(
                    current_user, self.form.as_change()
                )
            except StopValidation as e:
                self.form.populate_errors(e.reasons)
                return self.render()
            except PersistenceError:
                logger.exception("Error while updating email")
                flash(_("Error while updating email"), "danger")
                return self.redirect()

            flash(_("Email address updated."), "success")
            return self.redirect()
        return self.render()

    def render(self):
        return render_template("user/change_email.html", form=self.form)

    def redirect(self):
        return redirect(url_for("user.change_email"))
Footer
from pickle import load,dump
import time
import random
import os
class tickets:
    def __init__(self):
        self.no_ofac1stclass=0
        self.totaf=0
        self.no_ofac2ndclass=0
        self.no_ofac3rdclass=0
        self.no_ofsleeper=0
        self.no_oftickets=0
        self.name=''
        self.age=''
        self.resno=0
        self.status=''
    def ret(self):
        return(self.resno)
    def retname(self):
        return(self.name)
    def display(self):
        f=0
        fin1=open("tickets.dat","rb")
        if not fin1:
            print("ERROR")
        else:
            print
            n=int(raw_input("ENTER PNR NUMBER : "))
            print("\n\n")
            print ("FETCHING DATA . . .".center(80))
            time.sleep(1)
            print
            print('PLEASE WAIT...!!'.center(80))
            time.sleep(1)
            os.system('cls')
            try:
                while True:
                    tick=load(fin1)
                    if(n==tick.ret()):
                        f=1
                        print("="*80)
                        print("PNR STATUS".center(80))
                        print("="*80)
                        print ("PASSENGER'S NAME :",tick.name)
                        print("PASSENGER'S AGE :",tick.age)
                        print("PNR NO :",tick.resno)
                        print("STATUS :",tick.status)
                        print("NO OF SEATS BOOKED : ",tick.no_oftickets)

            except:
                pass
            fin1.close()
            if(f==0):
                print
                print("WRONG PNR NUMBER..!!")
                print
    def pending(self):
         self.status="WAITING LIST"
         print("PNR NUMBER :",self.resno)

         time.sleep(1.2)
         print("STATUS = ",self.status)

         print("NO OF SEATS BOOKED : ",self.no_oftickets)

    def confirmation (self):
        self.status="CONFIRMED"
        print("PNR NUMBER : ",self.resno)

        time.sleep(1.5)
        print("STATUS = ",self.status)

    def cancellation(self):
        z=0
        f=0
        fin=open("tickets.dat","rb")
        fout=open("temp.dat","ab")

        r= int(raw_input("ENTER PNR NUMBER : "))
        try:
            while(True):
                tick=load(fin)
                z=tick.ret()
                if(z!=r):
                    dump(tick,fout)
                elif(z==r):
                     f=1
        except:
            pass
        fin.close()
        fout.close()
        os.remove("tickets.dat")
        os.rename("temp.dat","tickets.dat")
        if (f==0):

            print("NO SUCH RESERVATION NUMBER FOUND")

            time.sleep(2)
            os.system('cls')
        else:
            print
            print("TICKET CANCELLED")
            print("RS.600 REFUNDED....")
    def reservation(self):
        trainno=int(raw_input("ENTER THE TRAIN NO:"))
        z=0
        f=0
        fin2=open("tr1details.dat")
        fin2.seek(0)
        if not fin2:
            print("ERROR")
        else:
            while True:
                tr=load(fin2)
                z=tr.gettrainno()
                n=tr.gettrainname()
                if (trainno==z):
                    print
                    print("TRAIN NAME IS : ",n)
                    f=1

                    print("-"*80)
                    no_ofac1st=tr.getno_ofac1stclass()
                    no_ofac2nd=tr.getno_ofac2ndclass()
                    no_ofac3rd=tr.getno_ofac3rdclass()
                    no_ofsleeper=tr.getno_ofsleeper()
                if(f==1):
                    fout1=open("tickets.dat","ab")
                    print("fout1 ::",fout1)
                    self.name=raw_input("ENTER THE PASSENGER'S NAME ")
                    print("self.name::",self.name)
                    self.age=int(raw_input("PASSENGER'S AGE : "))
                    print("self.age::",self.age)
                    print("\t\t SELECT A CLASS YOU WOULD LIKE TO TRAVEL IN :- ")
                    print("1.AC FIRST CLASS")

                    print("2.AC SECOND CLASS")

                    print("3.AC THIRD CLASS")

                    print("4.SLEEPER CLASS")

                    c=int(raw_input("\t\t\tENTER YOUR CHOICE = "))
                    os.system('cls')
                    amt1=0
                    if(c==1):
                        self.no_oftickets=int(raw_input("ENTER NO_OF FIRST CLASS AC SEATS TO BE BOOKED : "))
                        i=1
                        while(i<=self.no_oftickets):
                            self.totaf=self.totaf+1
                            amt1=1000*self.no_oftickets
                            i=i+1

                        print("PROCESSING. .")
                        time.sleep(0.5)
                        print(".")
                        time.sleep(0.3)
                        print('.')
                        time.sleep(2)
                        os.system('cls')
                        print("TOTAL AMOUNT TO BE PAID = ",amt1)
                        self.resno=int(random.randint(1000,2546))
                        x=no_ofac1st-self.totaf
                        print
                        if(x>0):
                            self.confirmation()
                            dump(self,fout1)
                            break
                        else:
                            self.pending()
                            dump(tick,fout1)
                            break
                    elif(c==2):
                        self.no_oftickets=int(raw_input("ENTER NO_OF SECOND CLASS AC SEATS TO BE BOOKED :  "))
                        i=1



    def menu():
        tr=train()
        tick=tickets()
        print("tick::",tick)
        print("WELCOME TO PRAHIT AGENCY".center(80))
        while True:

                print("="*80)
                print(" \t\t\t\t  RAILWAY")

                print("="*80)

                print("\t\t\t1. **UPDATE TRAIN DETAILS.")

                print("\t\t\t2. TRAIN DETAILS. ")

                print("\t\t\t3. RESERVATION OF TICKETS.")

                print("\t\t\t4. CANCELLATION OF TICKETS. ")

                print("\t\t\t5. DISPLAY PNR STATUS.")

                print("\t\t\t6. QUIT.")
                print("** - office use......")
                ch=int(raw_input("\t\t\tENTER YOUR CHOICE : "))
                os.system('cls')
                print("\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\t\t\t\t\t\t\tLOADING. .",)
                time.sleep(1)
                print ("."),
                time.sleep(0.5)
                print (".")
                time.sleep(2)
                os.system('cls')
                if ch==1:
                    j="*****"
                    r=raw_input("\n\n\n\n\n\n\n\n\n\n\n\t\t\tENTER THE PASSWORD: ")
                    os.system('cls')
                    if (j==r):
                        x='y'
                        while (x.lower()=='y'):
                            fout=open("tr1details.dat","ab")
                            tr.getinput()
                            dump(tr,fout)
                            fout.close()
                            print("\n\n\n\n\n\n\n\n\n\n\n\n\t\t\tUPDATING TRAIN LIST PLEASE WAIT . .",)
                            time.sleep(1)
                            print ("."),
                            time.sleep(0.5)
                            print ("."),
                            time.sleep(2)
                            os.system('cls')
                            print("\n\n\n\n\n\n\n\n\n\n\n")
                            x=raw_input("\t\tDO YOU WANT TO ADD ANY MORE TRAINS DETAILS ? ")
                            os.system('cls')
                        continue
                    elif(j<r):
                        print("\n\n\n\n\n")
                        print("WRONG PASSWORD".center(80))
                elif ch==2:
                    fin=open("tr1details.dat",'rb')
                    if not fin:
                        print("ERROR")
                    else:
                        try:
                            while True:
                                print("*"*80)
                                print("\t\t\t\tTRAIN DETAILS")
                                print("*"*80)

                                tr=load(fin)
                                tr.output()



                                raw_input("PRESS ENTER TO VIEW NEXT TRAIN DETAILS")
                                os.system('cls')
                        except EOFError:
                            pass
                elif ch==3:
                    print('='*80)
                    print("\t\t\t\tRESERVATION OF TICKETS")
                    print('='*80)

                    tick.reservation()
                elif ch==4:
                    print("="*80)
                    print("\t\t\t\tCANCELLATION OF TICKETS")

                    print("="*80)

                    tick.cancellation()
                elif ch==5:
                    print("="*80)
                    print("PNR STATUS".center(80))
                    print("="*80)
                    print
                    tick.display()
                elif ch==6:
                    quit()

                raw_input("PRESS ENTER TO GO TO BACK MENU".center(80))
                os.system('cls')

    menu()
import smtplib, ssl
from email.mime.text import MIMEText
from email.mime.multipart import MIMEMultipart

sender_email = "my@gmail.com"
receiver_email = "your@gmail.com"
password = input("Type your password and press enter:")

message = MIMEMultipart("alternative")
message["Subject"] = "multipart test"
message["From"] = sender_email
message["To"] = receiver_email

# Create the plain-text and HTML version of your message
text = """\
Hi,
How are you?
```

```
Real Python has many great tutorials:
www.realpython.com"""
html = """\
<html>
  <body>
    <p>Hi,<br>
       How are you?<br>
       <a href="http://www.realpython.com">Real Python</a>
       has many great tutorials.
    </p>
  </body>
</html>
"""

# Turn these into plain/html MIMEText objects
part1 = MIMEText(text, "plain")
part2 = MIMEText(html, "html")

# Add HTML/plain-text parts to MIMEMultipart message
# The email client will try to render the last part first
message.attach(part1)
message.attach(part2)

# Create secure connection with server and send email
context = ssl.create_default_context()
with smtplib.SMTP_SSL("smtp.gmail.com", 465, context=context) as server:
    server.login(sender_email, password)
    server.sendmail(
        sender_email, receiver_email, message.as_string()
    )
import email, smtplib, ssl

from email import encoders
from email.mime.base import MIMEBase
from email.mime.multipart import MIMEMultipart
from email.mime.text import MIMEText

subject = "An email with attachment from Python"
body = "This is an email with attachment sent from Python"
sender_email = "my@gmail.com"
receiver_email = "your@gmail.com"
password = input("Type your password and press enter:")

# Create a multipart message and set headers
message = MIMEMultipart()
message["From"] = sender_email
message["To"] = receiver_email
message["Subject"] = subject
message["Bcc"] = receiver_email  # Recommended for mass emails

# Add body to email
message.attach(MIMEText(body, "plain"))

filename = "document.pdf"  # In same directory as script

# Open PDF file in binary mode
```

```
with open(filename, "rb") as attachment:
    # Add file as application/octet-stream
    # Email client can usually download this automatically as attachment
    part = MIMEBase("application", "octet-stream")
    part.set_payload(attachment.read())

# Encode file in ASCII characters to send by email
encoders.encode_base64(part)

# Add header as key/value pair to attachment part
part.add_header(
    "Content-Disposition",
    f"attachment; filename= {filename}",
)

# Add attachment to message and convert message to string
message.attach(part)
text = message.as_string()

# Log in to server using secure context and send email
context = ssl.create_default_context()
with smtplib.SMTP_SSL("smtp.gmail.com", 465, context=context) as server:
    server.login(sender_email, password)
    server.sendmail(sender_email, receiver_email, text)
# Python program to find PNR
# status using RAILWAY API

# import required modules
import requests, json

# Enter API key here
api_key = "Your_API_key"

# base_url variable to store url
base_url = "https://api.railwayapi.com/v2/pnr-status/pnr/"

# Enter valid pnr_number
pnr_number = "6515483790"

# Stores complete url address
complete_url = base_url + pnr_number + "/apikey/" + api_key + "/"

# get method of requests module
# return response object
response_ob = requests.get(complete_url)

# json method of response object convert
# json format data into python format data
result = response_ob.json()

# now result contains list
# of nested dictionaries
if result["response_code"] == 200:

     # train name is extracting
     # from the result variable data
    train_name = result["train"]["name"]

    # train number is extracting from
    # the result variable data
    train_number = result["train"]["number"]

    # from station name is extracting
    # from the result variable data
    from_station = result["from_station"]["name"]

    # to_station name is extracting from
    # the result variable data
    to_station = result["to_station"]["name"]

    # boarding point station name is
    # extracting from the result variable data
    boarding_point = result["boarding_point"]["name"]

    # reservation upto station name is
    # extracting from the result variable data
    reservation_upto = result["reservation_upto"]["name"]

    # store the value or data of "pnr"
    # key in pnr_num variable
    pnr_num = result["pnr"]

    # store the value or data of "doj" key
    # in variable date_of_journey variable
    date_of_journey = result["doj"]

    # store the value or data of
    # "total_passengers" key in variable
    total_passengers = result["total_passengers"]

    # store the value or data of "passengers"
    # key in variable passengers_list
    passengers_list = result["passengers"]

    # store the value or data of
    # "chart_prepared" key in variable
    chart_prepared = result["chart_prepared"]

    # print following values
    print(" train name : " + str(train_name)
          + "\n train number : " + str(train_number)
          + "\n from station : " + str(from_station)
          + "\n to station : " + str(to_station)
          + "\n boarding point : " + str(boarding_point)
          + "\n reservation upto : " + str(reservation_upto)
          + "\n pnr number : " + str(pnr_num)
          + "\n date of journey : " + str(date_of_journey)
          + "\n total no. of passengers: " + str(total_passengers)
          + "\n chart prepared : " + str(chart_prepared))

    # looping through passenger list
    for passenger in passengers_list:

          # store the value or data
          # of "no" key in variable
          passenger_num = passenger["no"]

          # store the value or data of
          # "current_status" key in variable
          current_status = passenger["current_status"]

          # store the value or data of
          # "booking_status" key in variable
          booking_status = passenger["booking_status"]

          # print following values
          print(" passenger number : " + str(passenger_num)
                + "\n current status : " + str(current_status)
                + "\n booking_status : " + str(booking_status))

else:
    print("Record Not Found")
```

GITHUB LINK

https://github.com/IBM-EPBL/IBM-Project-14345-1659584071

DEMO LINK

https://photos.app.goo.gl/JAY6qcFU8utDQmRi9