SMART SOLUTIONS FOR RAILWAYS

PET ENGINEERING COLLEGE

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A PROJECT REPORT

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- **INTRODUCTION**
- **PROJECTOVERVIEW**

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 humanto-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**
  - **EXISTINGSYSTEM**

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.

- **References**

[1] S.Karthick and A. Velmurugan, "Android sub urban railway ticketing with GPS as ticket checker," *2012 IEEE International Conference on Advanced Communication Control and Computing Technologies(ICACCCT)*,pp.63-66,2012.

[2]C.Ulianov,P.HydeandR.Shaltout,"RailwayApplicationsforMonitoringandTrackingSystems," *Marinov,M.(eds)SustainableRailTransport.LectureNotesinMobility.Springer,Cham.*,2018.

[3]B. Mallikarjuna, A. K. R. Doddi and G.Sailaja,"Enhanced RailwayReservation System using Internet of Things," *2018 IADS International Conference on Computing, Communications & Data Engineering(CCODE)*,2018.

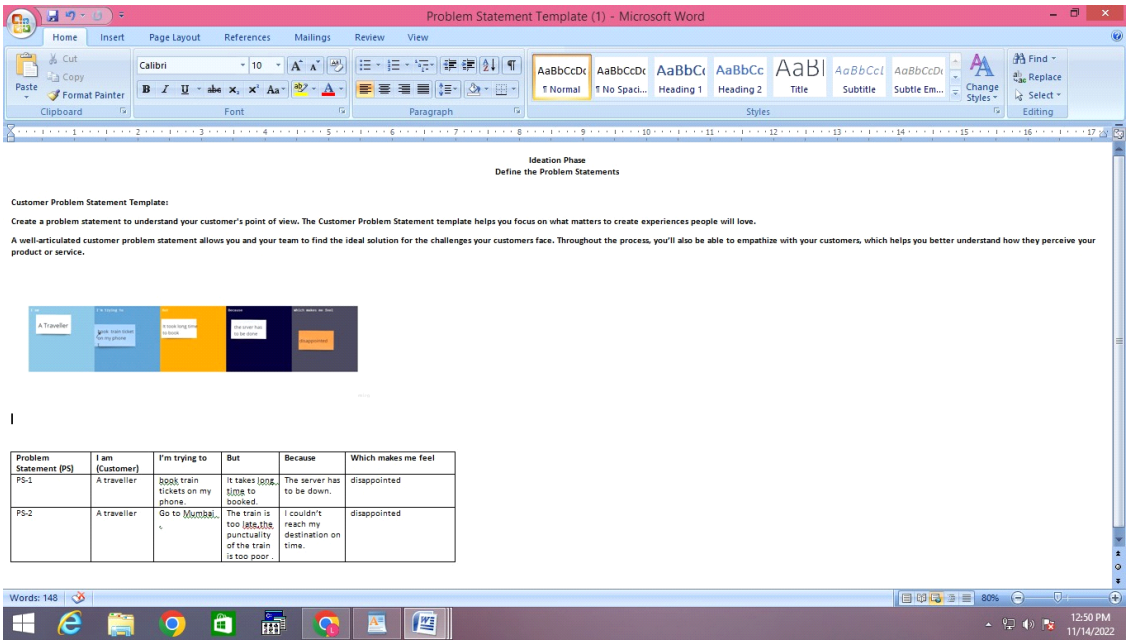
[4]G. Shelar, V. Rathod and S. Patil, “Railway Ticket Booking System with Restricted Wi-Fi Zone,” *International Journal of Trend in Scientific Research and Development (ijtsrd),* vol. 2, no.4, pp.611-615,2018.

[5]Swarup, M. Mohan, A. Dwivedi, C. Sonkar, R. Prasad, M. Bag and V. Singh, “A QR code based processing for dynamic and transparent seat allocation in Indian railway,” *International Journal of Computer Science Issues (IJCSI) 9, no.3(2012),*p.338,2012.

[6]*R .I .Rajkumar, P.E. Sankaranarayanan and G.Sundari, “GPS andEthernet based real time train tracking system,” 2013 International Conference on Advanced Electronic Systems (ICAES), pp.282-286,2013.*

2.3. 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 onboard

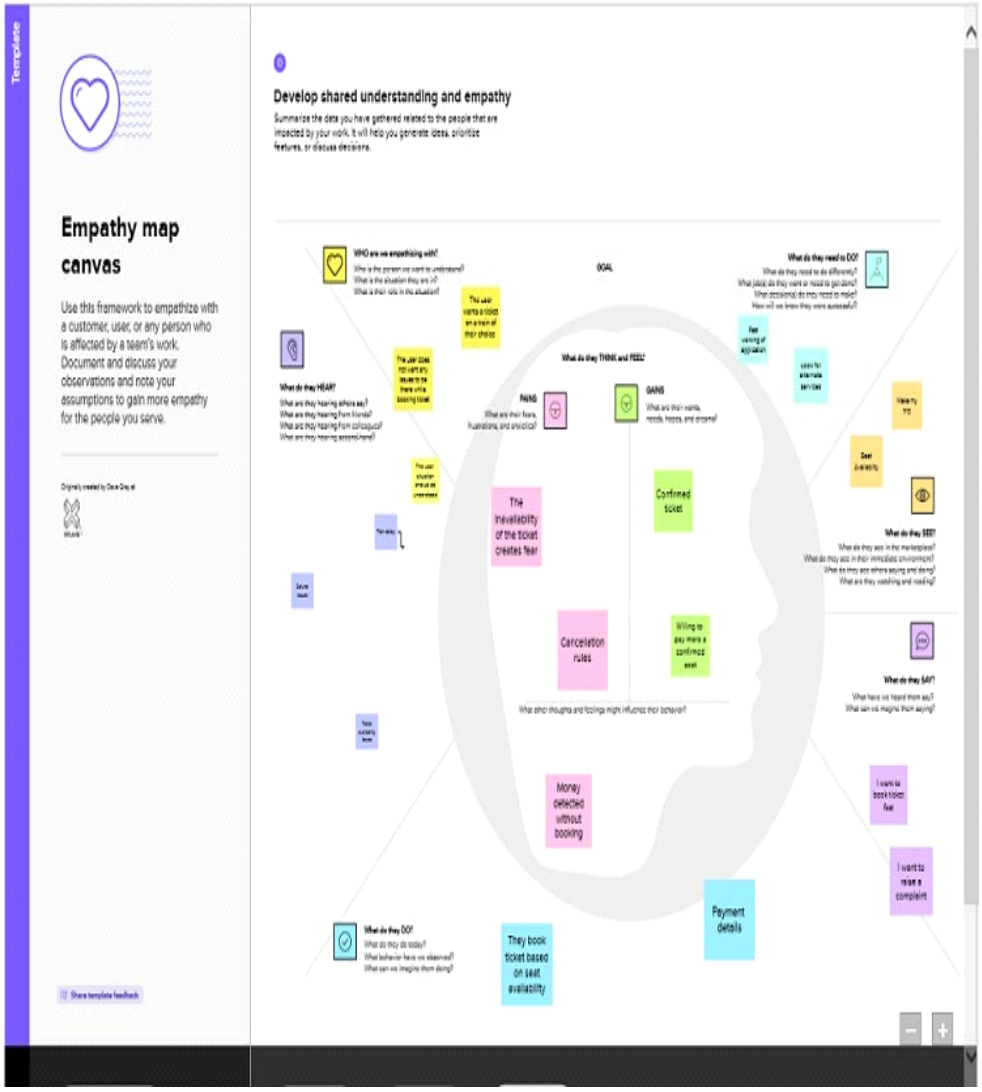


Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	A traveller	book train tickets on my phone.	It takes long time to booked.	The server has to be down.	disappointed
PS-2	A traveller	Go to Mumbai .	The train is too late,the punctuality of the train is too	I couldn't reach my destination on time.	disappointed

			poor .		

- **IDEATION AND PROPOSEDSOLUTON**
  - **EMPATHY MAPCANVAS**

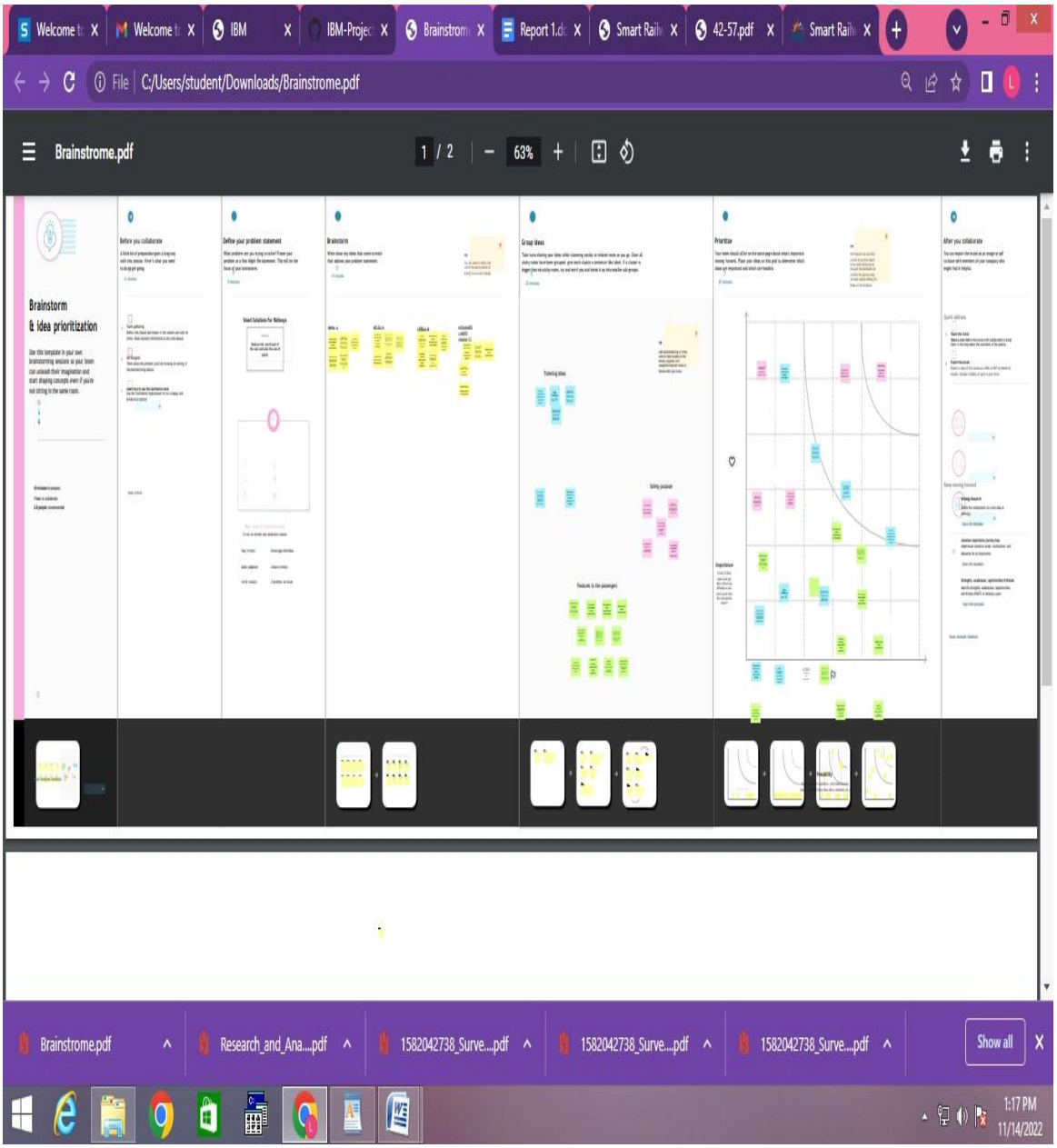
    An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviors and attitudes. It is a useful tool to helps teams better understand their users. Empathy mapping is a simple workshop activity that can be done with stakeholders, marketing and sales, product development, or creative teams to build empathy for end users.



- **IDEATION &BRAINSTORMING**

Brainstorming combines a relaxed, informal approach to problem solving with lateral thinking. It encourages people to come up with thoughts and ideas that can, at first, seem a bit crazy. Some of these ideas can be crafted into original, creative solutions to a problem, while others

can spark even more ideas. This helps to get people unstuck by "jolting" them out of their normal ways of thinking.



- **ProposedSolution**

S.NO	Parameter	Description
1.	Problem Statement (Problem to be solved)	While booking a train ticket the user takes long time to book and sometimes the ticket gets lost. As a solution for this an IOT based web application is introduced which reduces the work load and paper work.
2.	Idea / Solution description	Using this web app the user can check the seat availability while booking a ticket and instead of the ticket paper the QR code is developed for individual user.
3.	Novelty / Uniqueness	This web app enables the user to track the status as the GPS module is present and the status of the train is updated. By using this application user can know the current status like departures, arrivals, delays of the train and in this model the ticket paper is not needed.
4.	Social Impact / Customer Satisfaction	The loss of ticket paper at the last moment makes the user feel

		stress and the user has to face the loss of pay. The poor punctuality of the train makes the customer feel disappointed.
5.	Business Model (Revenue Model)	**Increased efficiency:**Congestion and over crowding create operational inefficiencies.Using deep learning and AI through computer vision,operators can monitor passenger flow and gather data for advanced analytics to help enable more-informed decision-making around staffing and security. **Reduced downtime:** Sensors, cameras and in-vehicle computers empower rail operators to monitor their fleets diagnostic data to minimize breakdowns,predict

		maintenance repairs and optimize servicing schedules to keep trains in working order and moving.

3.3. Problem

Solution Fit

1.customer segment

All Indian Railways passengers.

- **Problems**

Smart solution for railways are designed to reduce the work load of theuser,also the use of paper and to improve the usability of ticket maintenanace.

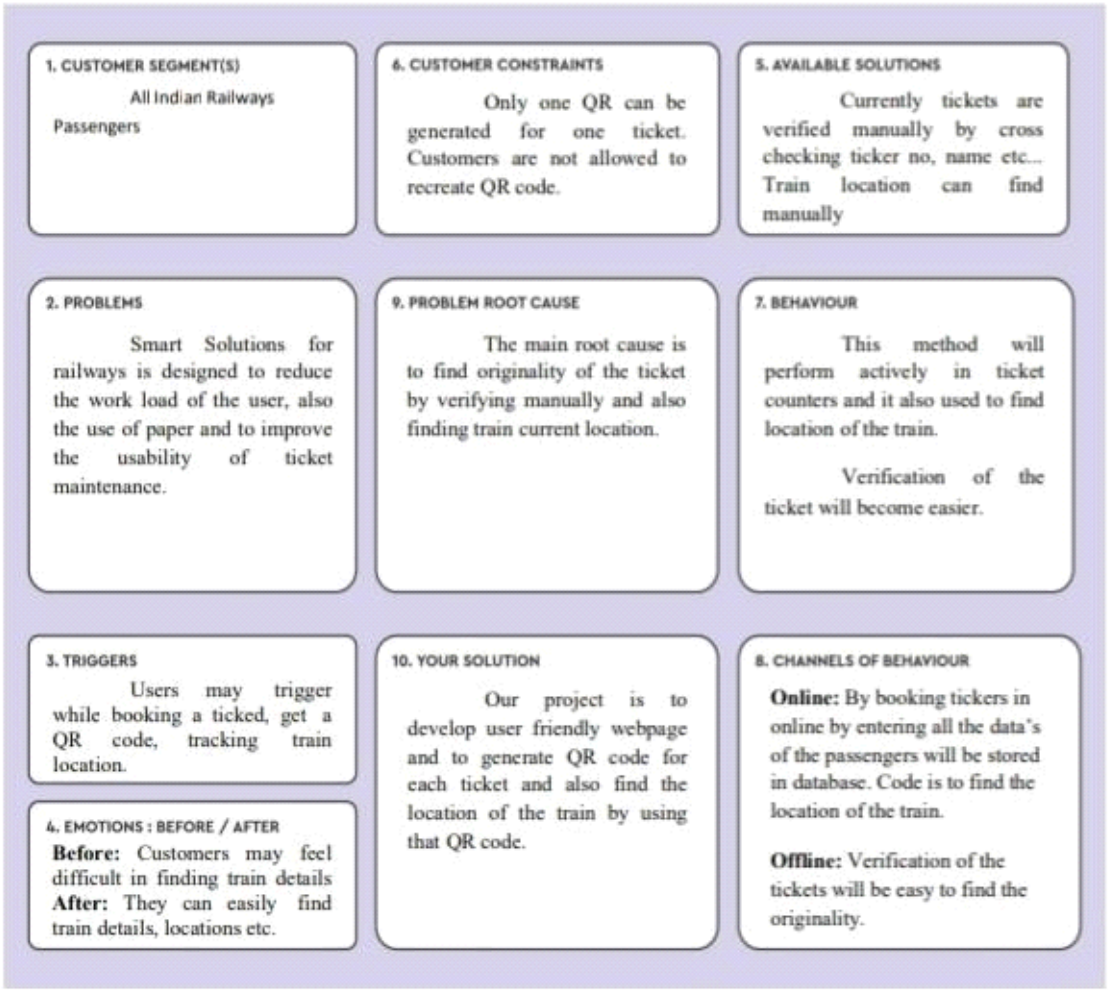
- **Triggers**

User may trigger while booking ticket,get a QRcode ,tracking trainlocation.

- **Available solution**

Currently tickets are verified manually by cross checking ticket number,name etc.Train location can found manually

Problem Solution Fit:



- **REQUIREMENT ANALYSIS**
  - **Functional requirement**

FR No.	Functional Requirement(Epic)	Sub Requirement(Story/Sub-Task)
FR-1	User Registration	Registration through Gmail Registration through Facebook Registration through Mobile number

FR-2	User Confirmation	Confirmation via Email Confirmation via OTP Confirmation via call
FR-3	Journey details	Provides From and To information and date of travel.
FR-4	Select Trains	Select the appropriate trains among the list and Also based on these at availability.
FR-5	Book and add passenger	Fill the essential details such as name,contact details age,sex.
FR-6	Proceed to pay	Select an appropriate payment options among UPI ,Internet Banking ,credit card, debit card.
FR-7	Ticket confirmation and Invoices	Ticket confirmation status is send to the irregistered email id
FR-8	GPS	Tracking the live location and the status will be updated to the passengers.
FR-9	GSM	To get a wake up call alarm prior before the destination is reached.
FR-10	Data base management	Entire Journey details will be stored in the server.
FR-	E-catering	Foods are available for the registered

11		passengers in an effective manner.

- **Non-Functional requirements**

FR No.	**Non-Functional Requirement**	**Description**
NFR-1	**Usability**	Availability of e-tickets with QR generation instead of physical one.
NFR-2	**Security**	It protects the details of a passengeragainst Eaves dropping and denial of service attacks.
NFR-3	**Reliability**	It enables the user to securely use theapp which provides maximum trust to the user.
NFR-4	**Performance**	No server down problems , many user can access at same the same time. Better

		performance is provided.
NFR-5	**Availability**	Accessibility through website orapplication anytime and from anywhere.
NFR-6	**Scalability**	No of users concurrently interactingwith our web application with higher reliability.

- **PROJECT DESIGN**

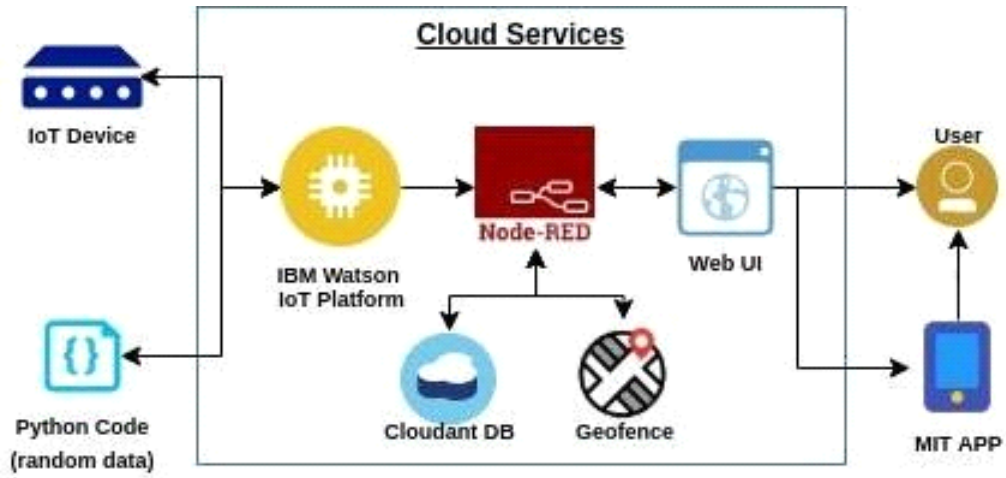
  - **Data Flow Diagrams**

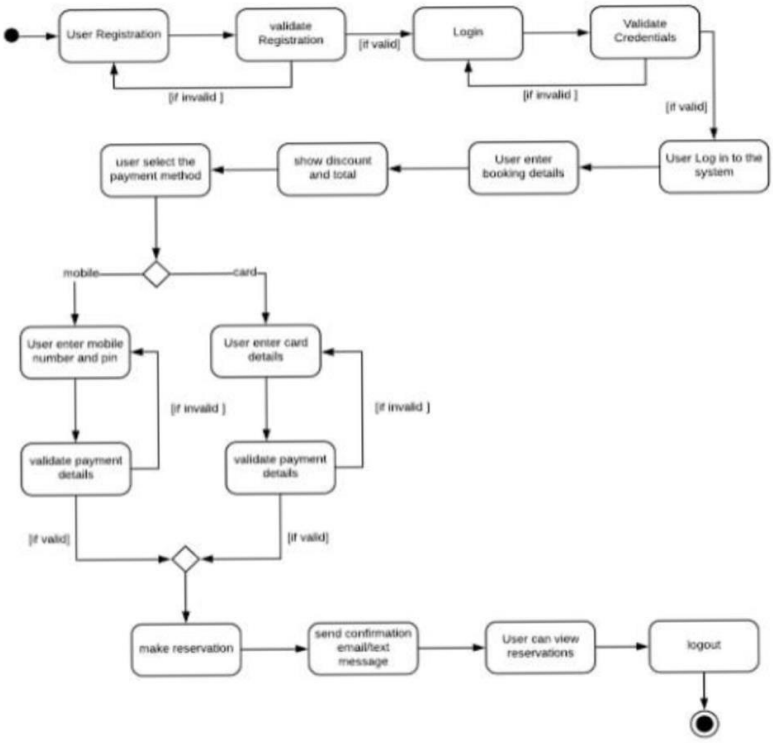
A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat andclear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.

DATAFLOWDIAGRAM

  - **Solution & Technical architecture**

Technical Architecture is the name of the total concept that is applied to the IT Infrastructure of an organization. IT Infrastructure is a coherent set of interconnected hardware and software, like networks, clouds, servers, clients, printers, tablet PC, smart phones.





- **User Stories**

User Type	Functional Requirement(Epic)	User Story Number	User Story/Task	Acceptance criteria	Priority	Release
Passenger	Registration	USN-1	As a passenger, I want to createa login credentials so I can securely access myself service online account.	Inputdatafieldstoenter:1.Username/email2.Password 3.Re-enterpassword4.Security question5.Securityanswer	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for creating an account.	I can receive confirmation email & click confirm.	High	Sprint-1
		USN-3	As a user, I	I can register & access my account by using	High	Sprint-2

			can also create an account using Google.	Google Login details.		
		USN-4	As a user, I can also create an account using Face book.	I can register & access my account by using Face book login details.	Medium	Sprint-3
	Login	USN-5	As a user ,I can login to the account by	I can login to the system sothat my information can only be accessed by me.	High	Sprint-1

			entering my email and password. As a user, I can login to the account through Face book if I previously registered with it. As a user, I can reset my password if I have forgotten			

			my passwor d.			
	MyAccou nt	USN-6	As a user, I can view my personal account. As a user, I can edit my Profile.	I can use my personal Account for booking process.	Hi gh	Sprin t-1
Custo mer CareE xecu tive		CCE-1	As a custome r care executiv e, Ican take complai nts, answer calls from the custome rs regardin g all the queries.	Pays attention to customer satisfaction to understand what services need improve ments. Customer care executive should be able to assist theusers by easily.	Hi gh	

- **PROJECT PLANNING AND DESIGNING**
  - **Sprint planning and estimation**

Sprint	Functional Requirement (Epic)	User Story Number	User Story Task	Story Point	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register the application for a convenient use	2	High	2
Sprint-1		USN-2	As a user, I willreceive confirmation email once I have registered for the device.	1	High	1
Sprint-2		USN-3	As a user, I can register for the taking care of child tracking location.	2	Low	2
Sprint-1		USN-4	As a device, we cantrack them and share the notification the user.	2	Medium	2
Sprint	Login	USN-5	As a user, I can	1	High	1

-1	Byuser		log into the application . And they can track the location of the train by entering the trainnumber			
	Dashboard		The user canget lots of notification options, GPS tracker ,alarm in case of emergency.	3	High	3

- **SPRINT DELIVERYSCHEDULE**

Sprint	**Total Story Points**	**Duration**	**Sprint Start Date**	**Sprint End Date (Planned)**	**Story Points Completed (ason Planned End Dat**	**Sprint Release Date (Actual)**

					e)	
Sprint -1	20	6 Days	24 Oct 2022	29Oct 22	20	29 Oct 2022
Sprint -2	20	6 Days	31 Oct 2022	05 Nov 2022	20	05 Nov 2022
Sprint -3	20	6 Days	07 Nov 2022	12 Nov 2022	19	12 Nov 2022
Sprint -4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

- **FEATURES**
  - **FEATURE 1**

• IOT device

• IBM Watson platform

• Node red

• Cloudant DB

• Web UI

• Geo fence

• MIT App

• Python code

  - **FEATURE2**

• Registration

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

Testcase ID	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
2	UI	Generating OTP	Generating the option further process				numbers, Gmail, Facebook or other social sites and to get oto number	Working as expected	pass				NAVEEN TR
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 verified is to be displayed	Working as expected	pass				KAVI S
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				NITHINRAJ R
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				NITHINRAAJ J

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SPRINT -2

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/N)	BUG ID	Executed By
1	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				NAVEEN T R
2	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		1, known to which the seats are available		known to which the seats are available	Working as expected	pass				NITHINRAAJ J
3	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	Working as expected	pass				KAVI S
4	Functional	Redirection	user can be redirected to the selected		1.After payment the usre will be redirected to the previous page		After payment the usre will be redirected to the previous page	Working as expected	pass				NITHINRAJ R

SPRINT -3

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/N)	BUG ID	Executed By
			during my journey.		4.Also enter the number member's details like name,age,gender								
2	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				NAVEEN TR
3	Functional	Remainder notificatio n	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				NITHINRAJ R
4	Functional	GPS tracking	user can track the train using GPS and can get information such as ETA, Current stop and		1.tracking train for getting information		tracking process through GPS	Working as expected	pass				NITHINRAAJ J

SPRINT -4

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/N)	BUG ID	Executed By
1	Functional	Ticket cancellatio	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				NITHINRAJ R
2	UI	Raise queries	user can raise queries through the query box or via mail.		1,raise the queries		raise the queries	Working as expected	pass				NITHINRAAJ J
3	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				KAVI S
4	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				NAVEEN TR

- **RESULTS**
- **PERFORMANCE METRICS**

- **ADVANTAGES & DISADVANTAGES**

10.1 ADVANTAGES

- Openness – compatibility between different system modules, potentially from differentvendors;
- Orchestration – ability to manage large numbers of devices,with full visibility overthem;
- Dynamic scaling – ability to scale the system according to theapplication needs,

through resource virtualization and cloud operation;

- Automation – ability to automate parts of the system monitoring application, leading to better performance andlower operation costs.

10.2. DISADVANTAGES

- Approaches to flexible, effective, efficient, and low-costdata 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 thecloud, for further processing;
- Online data processing systems, for real-time

monitoring, using
emerging

- Communication technologies;
- Integrated, interoperable, and scalable solutions for railwaysystems preventive maintenance.

- **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**

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.

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'UTF-8')

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sys.exit()

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    200:
data = response.json()
places =
    data.get
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    lements
    &#39;,
    [])
```

```
for place in
places:
coords.app
end((place[
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    at&#39;
    ],
    place[&
    #39;lon
    &#39;])
    )
print
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time.sleep(1)

deviceCli.disconnect()