# Project Report

Project Name: **SMART SOLUTIONS FOR RAILWAYS**
Team ID: **PNT2022TMID11066**


## TEAM LEAD:

**SAHITH AFRIDI. S**

## TEAM MEMBERS:

**1. SANJAY. B**
**2. PALANIYAPPAN. A**
**3. DIWAKAR. M**


# 1.1 Project Abstract :


People use Indian Railways to travel even on daily basis and if the railways are not secure and prone to accident then life of many A lot of people in India travel to other places using railways and some people are at risk. A lot of railway accidents occur at level crossing that is the point of intersection of road and railway track and the reason in most of the cases in human error. So, to avoid the accidents caused due to human failure this model is to make level crossing unmanned and smart than can reduce the chances of accidents manifold. In this proposed paper we have implemented ideas such as pre-crashing using RFID senser. This model automatically closes the gates of railway crossing when the train is arriving near the crossing before a safe interval of time so that there is no chance of human error. Also, our model keeps a track of the train passed from the particular crossing along with exact time of passing so that the data is maintained that too without human effort

# 1.2 Introduction :

Railways have to continually ensure that the rolling stock and infrastructure are in good condition, with high resilience against failures. There are number of challenges in planning of high-quality maintenance that has to be organized on efficient and cost effective manner. We wanted to be apart of our surrounding with some change and advancement so that it can bring the better life of the middle class and lower class people to travel in high secutity and advanced locomotions .the train is one and only most widely used transportion and not only for this they are used for goods transportion also .Indian railways are not able to facilate the customer properly due to crowded amount of people. Statistics show that the leading cause of death by injury in railways traffic accidents(two train collision each other). There are number of causes for which an accident can occur, some of them are; lack of training for driving or less experinessed, use of mobile phone while driving, unskilled drivers, driving while intoxicated, bad railway tack condition, overloading in tain and negligence traffic management. In this survey paper, we briefly review selected railway accidents detection techniques and propose a solution. Rear end crashes occur mainly due to obstracle and crack in tracks. According to recent statistics, a major percentage of train accident happen due to not proper survillance of railway track The existing system in semi automated railway accidents are occuring at frequently, consideration this in mind we want to bring some change and make it effective so that it becomes a complsory and law for pratice.

# 1.3 Objective :

Its application increases safety, efficiency and ease of use with train management systems. Control and surveillance systems reduce the risk of collisions and regulate speed. Advanced consumer technologies help maximise connectivity and allow passengers to continue their activities on smart devices while travelling.

IoT technologies help railways successfully manage passenger safety, operational efficiency, and the passenger experience

Smart sensors can be used to track important assets, manage passenger flow, and enable predictive maintenance

Connect people, sensors, trains and automated train systems with the highest security. Transform your communications and operations from departure to destination and beyond. Secure communications. Enhancing overall service. Lower operational cost IoT applications.

The Corporate aim of the Indian Railways is to commit itself to ensuring that all its activities are managed to the highest level of safety which is pragmatic and reasonably practicable to achieve

# 2. LITERATURE SURVEY

## 2.1 Existing problem

• A Web page is designed for the public where they can book tickets by seeing the available seats.
• After booking the train, the person will get a QR code which has to be shown to the Ticket Collector while boarding the train.
• The ticket collectors can scan the QR code to identify the personal details.
• A GPS module is present in the train to track it. The live status of the journey is updated in the Web app continuously
• All the booking details of the customers will be stored in the database with a unique ID and they can be retrieved back when the Ticket Collector scans the QR Code

1.Juyeop Kim
chnical
problems of Internet of Things and their solutions.
IEEE Internet of Things Journal 2018
Main problems in railways

2
Payal Srivastava

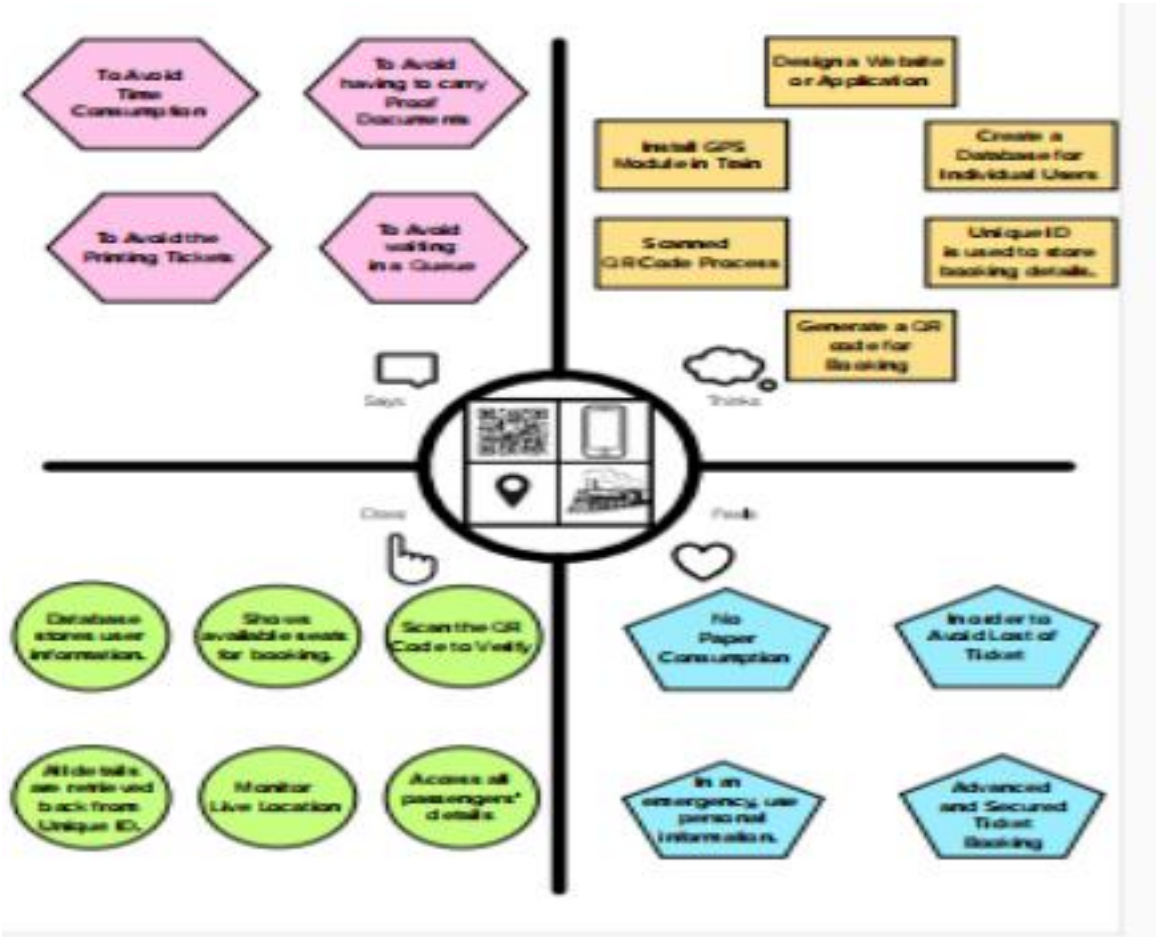
Construction and Building Materials Sañudo, Roberto, Marina
9th International Conference on Cloud
Computing, Data Science & Engineering 2019
Drainage in railways

3
Ohyun Jo Published on ”IEEE Internet of things journal 2018”. Wide ranging developments in the realms of sensors, radio access, networks, and hardware/software platforms have been made possible by the Internet of Things' (IoT) rapidly expanding demand.

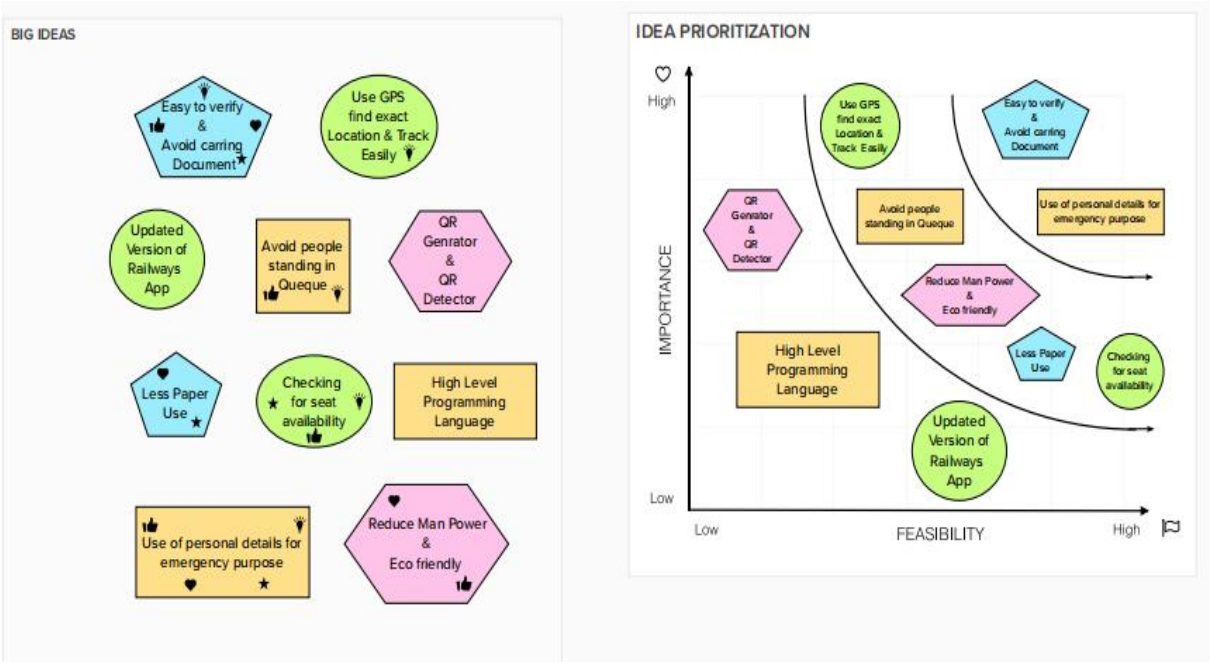
4
Y.Wang Published on “4th IET International Conference on Railway Condition Monitoring 2008”. Train speed and density have been steadily rising over the past 20 years due to the increased demand for railroad services. As a result, stricter safety standards are required for the infrastructure, signalling, and control of railroads.
5
Bo Ai Published on “5G Key Technologies for Smart Railways 2022”. Due to the rapid development of railways, particularly high-speed railways, railway communications have received considerable interest from both academia and industries (HSRs).The rail transportation sector needs to develop cutting-edge communication network architectures and critical technologies that guarantee high-quality transmissions for both passengers and railway operations and control systems in order to be in line with the goal of future smart rail communications.

# 3. IDEATION & PROPOSED SOLUTION

## 3.1 Empathy Map Canvas




# 3.2 Ideation & Brainstorming



**Project Design Phase-I**
**Proposed Solution Template**

| | |
|---|---|
| Date | 30 September 2022 |
| Team ID | PNT2022TMID11066 |
| Project Name | Project - Smart Solutions For Railways |
| Maximum Marks | 2 Marks |

**Proposed Solution Template:**

Project team shall fill the following information in proposed solution template.

| S.No. | Parameter | Description |
|---|---|---|
| 1. | **Problem Statement (Problem to be solved)** | • The goal of Smart Solutions for Railways is to reduce the amount of labour that users must do, as well as the use of paper, and to give real-time train location information.<br>• People that travel quickly and have busy schedules need an online booking method. In recent years, there have been noticeably longer lines in front of the ticket booths in railroad stations.<br>• The passenger experience is not sufficient or convenient with ticket reservations made at the counter. The passengers are trying to get tickets from ticket booths in a timely manner. They therefore choose to use online ticketing. |
| 2. | **Idea / Solution description** | ◆ The user can book tickets on a website, where they will also receive a QR code that they can provide to the ticket collector so that the ticket collector can scan it to retrieve the passenger's information.<br>◆ By installing a GPS module inside the train, the website also displays the train's real-time positions. The journey's location will be updated consistently on the website.<br>◆ The database will contain the user's booking information, which may be retrieved at any time. |
| 3. | **Novelty / Uniqueness** | ➢ The user will receive a QR code from the webpage, which will cut down on paperwork.<br>➢ All of the client booking information will be saved in the database with a special ID and may be retrieved when the ticket collector scans the QR Code.You may examine an interactive seat map as well. |

| | | |
|---|---|---|
| 4. | **Social Impact / Customer Satisfaction** | • There is no need to go to the station to book tickets, and the transaction process is made simple. One can update their online ticket booking and request a cancellation if their plans change.<br>• The consumer will receive notifications of all confirmations and cancellations through email and cell phone.<br>• In an emergency, we can quickly retrieve a doctor's passenger information. |
| 5. | **Business Model (Revenue Model)** | • Using this application, the user can plan their trip, check the availability of a seat, examine an interactive seat map, and choose a seat that is most convenient for them.<br>• Additionally, it makes it simple for your clients to plan trips and daily shuttles and it minimises the need to carry tickets.<br>• Without this solution, customers would have to travel to the station to purchase tickets and would also need to carry their tickets with them to present to the ticket collector.<br>• Customers could also view the train's current location. |
| 6. | **Scalability of the Solution** | 1. Printing Tickets is not required.<br>2. While handling counter tickets carefully is a must, text messages on a phone are more than sufficient.<br>3. By disregarding printouts, you are becoming more eco-friendly and helping to create a greener planet.<br>4. Tell TTR your name and that you are a passenger with a valid proof; there is no need to take your wallet out and display your ticket.<br>5. Booking an E-ticket instead of a counter ticket allows you to pay immediately from your bank account, making your work easier. Counter tickets required you to carry cash. |

# PROBLEM-SOLUTION FIT

## Smart Solutions For Railways

Define CS,fit into CC

### CUSTOMER SEGMENT(S) — CS

Who is your customer?

**According to our problem statement, the customer prefers trains as a form of transportation**

### CUSTOMER CONSTRAINTS — CC

What constraints prevent your customers from taking action or limit their choices of solutions?

**The passengers are able to handle our application with ease. The App, which is available on all smart devices and can only be used with a network connection, causes some difficulty for older persons to handle or use.**

### 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?

**If the app crashes or an error occurs while using it, passengers can book their tickets through the website. Previously, passengers had to travel to their nearest rail station to resolve such issues, but our solution is now quite simple and convenient.**

Explore AS, differentiate

Focus on J&P, tap into

### JOBS-TO-BE-DONE / PROBLEMS — J&P

Which jobs-to-be-done (or problems) do you address for your customers?

**The client information is kept in a database that can be accessed by scanning the QR code, and an application that allows users to book tickets based on available seats should be created.**

### 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?

**Our application often requires an internet connection, therefore when neither is present, the functionality of the QR code scanner or the ability to book tickets are interrupted.**

### BEHAVIOUR — BE

What does your customer do to address the problem and get the job done?

**If there is an issue, customers can contact customer support, and they will receive a prompt response. Customers can also provide feedback on the app for it to be improved even more.**

Focus on J&P, tap int C

Identify strong TR & EM

### TRIGGERS — TR

What triggers customers to act?

**If a person needs to go a long way, he or she can use this app to reserve tickets, find out the location of the train using GPS, and share all of the information with family members. This causes the app to be installed and used.**

### EMOTIONS: BEFORE / AFTER — EM

How do customers feel when they face a problem or a job and afterwards?

**After using this application, the customer feels comfortable buying tickets. Elderly people are free to choose their own pleasant seats. Verifying tickets using a QR code can save you a bunch of time.**

### YOUR SOLUTION — SL

**Our solution is to develop a mobile application that allows users to book tickets while also viewing available seats. Along with a database where customer information is saved, it also includes Smart QR verification.**

### CHANNELS OF BEHAVIOUR — CH

**ONLINE :**

What kind of actions do customers take online?

**Customers can submit feedback online in the setting option's support section.**

**OFFLINE :**

What kind of actions do customers take offline?

**Customers can send a message or email to the appropriate official immediately in offline mode.**

Extract online & offline CH of BE