SMART SOLUTIONS FOR RAILWAYS

Team ID	PNT2022TM30650
Project Name	Smart Solutions for Railways

ABSTRACT

As technology develops, new tools and software are created to make man's task easier. It takes a lot of time to wait in line for train tickets. Ticket booking system automation would be helpful for the government to implement proper and better rates for tickets and also for the people as they wouldn't need to wait in long lines. It would also be beneficial for the government to diagnose record of real-time data of each who are all using train tickets or metro tickets. By using this technique, travelers can purchase their tickets without having to wait in lengthy lines. In this project the admin can login the system using his/her user name and password. After the login process the admin can add and update the train details. The system allows the railway passenger to search for trains that are available between the two travel cities, namely the "Departure city" and "Arrival city" for a particular departure and arrival dates. The system display list of available trains and allows customer to choose and book a particular train. In this paper, we are proposing QR code generator and reader for ticket system. This system provides a facility for ticket checker to check daily passenger's ticket by just scanning the QR-code.

1. INTRODUCTION

1.1 PROJECT OVERVIEW

In this emerging world of computers all most all manual system automated and computerized but maximum of them are so complex and a common user is unable to operate that software system. This project explores how computer technology can be used to solve the problem of user. A high speed communication network needs to be developed for interconnecting the offices of railways. Existing train ticket booking system has some drawbacks, like ticket is regenerated every time and is in paper printout format. This is a vapid process, which requires reprinting the ticket every time. And existence system does not provide any security options. To overcome this problem the QR-code system became popular outside the automotive industry due to its fast readability and greater storage capacity compared to standard UPC barcodes. Application includes allowing user from anywhere to do a booking for a journey in any train in any class from anywhere to anywhere; handling reservation. In this project the admin can add the train details to this system. The user's who want to book the train ticket they are all register this application. After registration process the user can book the train ticket. The system will provide the QR code to the users. The QR code contains details of user train ticket booking details. This method gives ticket checkers the ability to quickly and easily check daily passenger tickets by simply scanning the QR-code.

1.2 PURPOSE

The main purpose of the "Smart Solution for Railways" can be bought easily anytime, anywhere and the ticket will be present in the customer's phone in the form of "Quick Response (QR) Code". Customer can book a ticket by specifying the source and the destination and book a ticket. The application will generate a QR code of booked ticket which will be used at railway station to scan the ticket QR code.

2. LITERATURE REVIEW

2.1 EXISTING PROBLEM

2.1.1 TITLE: QR code based Railway e-Ticket

AUTHOR: Ms Apeksha Waghmare, Pansambal, Aruna Pavate

We suggest developing a distinctive and user-friendly local train ticketing system. The system enables users to sign up, and as soon as they do, a special ID is generated in the system. Indian Railways' Western Central and Harbor lines allow users to reserve tickets, and the price is determined by the distance between stations. Later, the user account is debited for this fare balance. User may afterwards reload his account via an administrator. In this case, we make advantage of a station's server. Android devices that are within the server's Wi-Fi range can make reservations. Customers can now book tickets using their Android mobile thanks to our system. This system not only enables the purchase of individual train tickets for the western, central, or harbour lines, but also the acquisition of train or bus passes for the BEST, NMMT, KDMT, and MBMT. The user must submit his necessary information online, together with the source and destination stations. The user is given a unique ID after filling out the necessary information. To check a ticket, the user only needs to present this ID. The Ticket Checker inserts this ID into his Android programme, which allows him to get user information such as the individual's photo, the source and destination of the pass, its validity, etc. The user must decide on the travel's origin and destination. Additionally, the user has the choice of a one-way or roundtrip excursion. The user has the option of choosing the travel class. The administrator keeps track of a user's account balance and displays their history of purchased tickets for travel. The main benefit of using this application on our own devices is that you may book your tickets online, according to your preferences, and you don't have to lose time just waiting in line for your turn to buy tickets.

2.1.2 TITLE: To book or not to book through IRCTC – consumer's intention to use Indian Railway's online ticketing system

AUTHOR: Preshita Neha Tudu

The current paper examines consumers' interest in adopting by incorporating theory of relativity into the context of online railway ticketing in India the technology acceptance model (TAM), planned behaviour (TPB), and an Perceived risk is a further concept. There were 220 useful responses gathered. employing internet surveys with snowball sampling of customers. Structural Data analysis and a strength assessment using equation modelling were model fitting The findings showed that PU had a substantial impact on both consumers' and the way you feel about using the Indian Railways' online ticketing system. Further, PEOU was proven to have a favourable impact on consumers' perceptions of online ticketing. PBC, subjective norm, and attitude all had a substantial impact. Consumers' intent to use the Indian Railway's online ticketing system is displayed. TPB can be used to forecast customers' intentions for purchasing tickets online system. Finally, customers' intention to purchase tickets online was significantly impacted negatively by perceived risk. In the Indian context, railway management may use the findings to build policies and strategies relating to online ticketing. The study can help railway management to develop strategies for the online railway ticketing system in both, national and international context. The present study is among the few studies to understand the impact of consumer's attitude on consumer's intention to use online railway ticketing system in the Indian context.

2.1.3 TITLE: Application for online booking of unreserved ticket for Indian Railways

AUTHOR: Ijariit Journal, Deeksha Hegde B, Siddharthkumar Singh

There are over 1.2 billion passengers using Indian Railways. growing quite quickly. There are some of them people. group of people who frequently travel in the General Compartment. IRCTC developed a website platform for purchasing reserved compartment tickets. The clients who travel in the General Compartment continues to be problematic because are need to wait in a long line at the ticket counters in order to buying tickets. With the suggested method, we hope to offer a a workaround for travellers using the General Compartment has the option of booking their travel arrangements online. utilising an Android app. The system proposed by our team is an android application which is named as Instant General Ticketing Service (IGTS). The project attempts to resolve the issue by migrating the unreserved ticket booking means to online application. Similar to online reserved ticket booking system as furnished by IRCTC this application attempts to provide enough information on the time table of the trains running on the mentioned date and to book a ticket in the same. The reason for using an android application is that it enables easy design of GUI and connectivity to the backend of the system. Keeping the fact into picture that majority of Indian Mobile users are android users this application can scale itself to a larger extent. It provides an ease of booking the general compartment ticket for passenger at his/her convenience such as sitting at home or while being on the way to the station

2.1.4 TITLE: Digital Ticket Booking and Checking Using Aadhaar Card or Fingerprint and Android Application

AUTHOR: Adesh Jamnik, Munna Shahare, Mayur Bhadade

We can get a ticket under the existing system both over the counter and online, however owing to black marketing and the creation of paper tickets with carbon copies, we frequently do not receive a ticket. printing. And there are numerous manual steps in the ticket checking process. Work must be done to keep passenger records, which is arduous to control The solutions offered in this paper provide the remedy by employing Aadhaar to control the ticket buying procedure Using a card number or fingerprint instead of carbon printing will lessen its utilisation. Paper waste and ticket paper. We're making an android, a tool that will assist the ticket examiner in checking the ticket and preserve effective records. Online Platform is made for booking tickets of saved compartments, yet the clients who travel when all is said in done compartment still confront issues since they should hold up before the ticket counter in a long line to buy tickets [32]. In a transition to diminish hurriedness or blockage at ticket counters, Indian Railways introduce Automatic Ticket Vending Machines (ATVMs) at a few railroad stations for the ticket booking process, Passenger can purchase different kinds (top of the line and below average, single, return, and so forth) of ticket from ATVM machine. In any case, there are numerous disadvantages of ATVM savvy card like traveler need to revive the shrewd card according to prerequisite and there is no web based reloading framework for keen card, the cardholder doesn't have the legitimacy of his card and the card can be harm because of terrible condition We book the ticket utilizing two way,1st purchasing the ticket from the counter and second is by internet booking. Railroads allow users in any fare class to use mAadhaar, a digitised version of the Aadhaar card, as proof of identity. The unique identifiable proof agency of India launched m-Aadhaar, a mobile application that allows users to get their Aadhaar cards using only the mobile phone to which Aadhaar has been linked. The Aadhaar will show up after the passenger opens the application and enters the necessary secret word.

2.1.5 TITLE: Simulations In Order To Configurate An It Application That Allows Online Booking And Purchase Of The Single Travel Ticket For The Railway Transport And The Road System In Romania

AUTHOR: Desdemona Isabela SCĂRIȘOREANU

Online ticketing systems for multimodal passenger transportation have been successfully running for several years in various EU member states. Though, until Currently, the EU has not created a unified system for online ticketing for multimodal transportation. The development of an integrated system for booking and paying for travel tickets has been a priority for the EU's transport strategy for more than ten years. Online travel ticket booking and purchasing provides several advantages for both passengers and passenger transportation firms, as well as meeting contemporary societal demands, one of which is the urge to travel. Enhancing the standard of passenger services is the primary goal of the integrated e-ticketing system's implementation. The method for emulating the online single-ticket buying process for Considering that there is no direct railway link between Râmnicu Vâlcea and Bucharest, train and bus transportation was chosen to incorporate the connection of a locality from Vâlcea County with the city of Mangalia, via Bucharest. The UML activity diagram will be used to simulate the online purchase of a single travel ticket for multimodal transportation, starting with the premise that passenger Mihai Popescu, a retired man, wants to travel from Călimănești, in the county of Vlcea, to Mangalia. He takes advantage of the discounted rail and bus fares and plans to travel to Mangalia the next day.

2.2 REFERENCES

- **1.** Ms Apeksha Waghmare, Pansambal, Aruna Pavate, QR code based Railway e-Ticket, 2019.
- **2.** Preshita Neha Tudu, To book or not to book through IRCTC consumer's intention to use Indian railway's online ticketing system, 2020.
- **3.** Ijariit Journal, Deeksha Hegde B, Siddharthkumar Singh, Application for online booking of unreserved ticket for Indian Railways, 2019.
- **4.** Adesh Jamnik, Munna Shahare, Mayur Bhadade, Digital Ticket Booking and Checking Using Aadhaar Card or Fingerprint and Android Application, 2019.
- **5.** Desdemona Isabela SCĂRIȘOREANU, Simulations In Order To Configurate An It Application That Allows Online Booking And Purchase Of The Single Travel Ticket For The Railway Transport And The Road System In Romania, 2021.

2.3 PROBLEM STATEMENT DEFINITION

The existing system is completely paper based. So this system needs lots of man power. As this system needs lots of manpower and as papers will be moving from one place to another manually, lots of time is consumed. So time constraints maintenance is very difficult. As these records move from place to department the security provided to the data is very less. As this is manually done the data cannot be very accurate. Even there can be chance that intermediate person can leak the proposals. As this is entirely manual work the reservation should be available round the clock and from any place to any place. But this is not possible with the manual system.

3. IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS

3.2 IDEATION & BRAINSTORMING

3.3 PROPOSED SOLUTION

The Purpose of proposed system is to provide use of new technology in travel sector. To develop an python application that is cost efficient. To make an efficient use of QR-code technique. Provide solution without extra hardware requirement. To make system easy to handle. As this is an automated system, system is available all the time, so no need for the official availability so no delays in work. The process continues automatically does not need to wait for anyone to keep the proposal. Our proposed system is an automated format of the above Slated paper based work.

3.4 PROBLEM SOLUTION FIT

The majority of public transportation systems now in use require a lengthy, time-consuming step-by-step process for the manufacture and issuance of tickets. To obtain a ticket, a person must approach a conductor or go to the ticket counter. The conductor will then hand out tickets. There is no alternative option or backup for a lost ticket, and if he is detected, he must pay the fine.

4. REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENT

• Admin module

In this module, the admin can login the system using his/ her user name and password. After the login process the admin can add the train details. The details like train name, number, source and destination details, ticket details and ticket price details etc. these details are maintain and monitoring by the admin only. The details are stored to the database.

• User module

There is registration form available where new user can create their account by providing required information to the system. The registration form details are like name, email, gender, mobile number, address, and etc. These details are stored in the database. And then can getting to the username and password in the system. After registration process the user can login the system using his/her user name and password.

Ticket booking

In this module, the admin can view the train booking details like user details and train details like train name, train number, source, destination, time etc.

QR Code Generate

After viewing the train details the user can book the ticket of particular train using this system. If the user booking the train, the train booking details are sent to the user in the form of QR code.

• Checker module

In this module the checker will have QR-code reader and scan the QR-code with the application in order to validate QR-code and verify the journey details, especially the time and date of the ticket.

4.2 NON FUNCTIONAL REQUIREMENTS

Usability

The system shall allow the users to access the system with pc using web application. The system uses a web application as an interface. The system is user friendly which makes the system easy

Availability

The system is available 100% for the user and is used 24 hrs a day and 365 days a year. The system shall be operational 24 hours a day and 7 days a week.

Scalability

Scalability is the measure of a system's ability to increase or decrease in performance and cost in response to changes in application and system processing demands.

Security

A security requirement is a statement of needed security functionality that ensures one of many different security properties of software is being satisfied.

Performance

The information is refreshed depending upon whether some updates have occurred or not in the application. The system shall respond to the member in not less than two seconds from the time of the request submittal. The system shall be allowed to take more time when doing large processing jobs. Responses to view information shall take no longer than 5 seconds to appear on the screen.

Reliability

The system has to be 100% reliable due to the importance of data and the damages that can be caused by incorrect or incomplete data. The system will run 7 days a week. 24 hours a day.

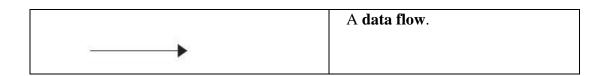
5. PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS

A two-dimensional diagram explains how data is processed and transferred in a system. The graphical depiction identifies each source of data and how it interacts with other data sources to reach a common output. Individuals seeking to draft a data flow diagram must identify external inputs and outputs, determine how the inputs and outputs relate to each other, and explain with graphics how these connections relate and what they result in. This type of diagram helps business development and design teams visualize how data is processed and identify or improve certain aspects.

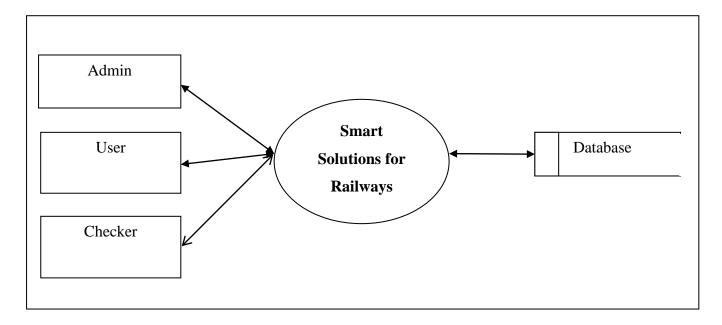
Data flow Symbols:

Symbol	Description			
	An entity . A source of data or a destination for data.			
	A process or task that is performed by the system.			
	A data store, a place where data is held between processes.			



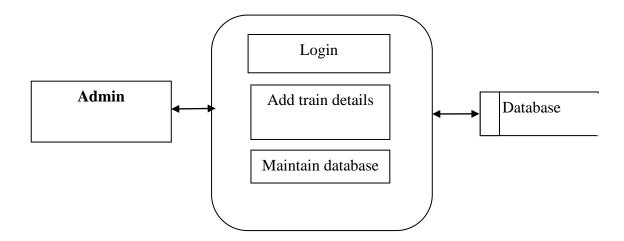
LEVEL 0

The Level 0 DFD shows how the system is divided into 'sub-systems' (processes), each of which deals with one or more of the data flows to or from an external agent, and which together provide all of the functionality of the system as a whole. It also identifies internal data stores that must be present in order for the system to do its job, and shows the flow of data between the various parts of the system.



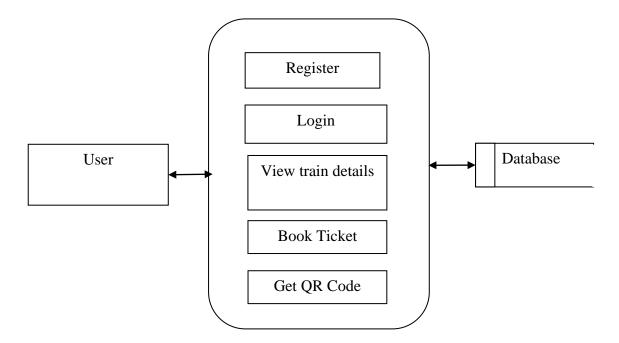
LEVEL 1

The next stage is to create the Level 1 Data Flow Diagram. This highlights the main functions carried out by the system. As a rule, to describe the system was using between two and seven functions - two being a simple system and seven being a complicated system. This enables us to keep the model manageable on screen or paper.

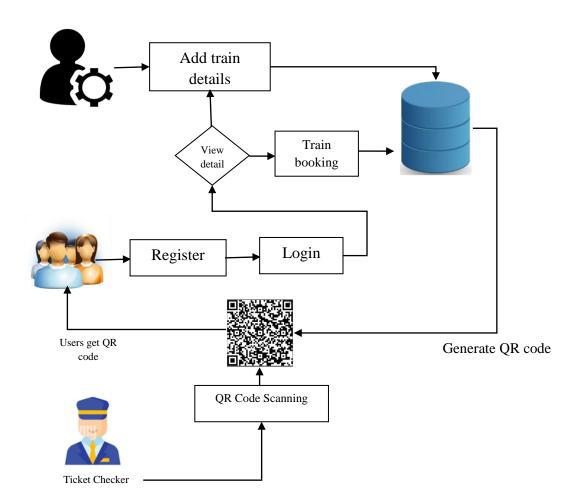


LEVEL 2

A Data Flow Diagram (DFD) tracks processes and their data paths within the business or system boundary under investigation. A DFD defines each domain boundary and illustrates the logical movement and transformation of data within the defined boundary. The diagram shows 'what' input data enters the domain, 'what' logical processes the domain applies to that data, and 'what' output data leaves the domain. Essentially, a DFD is a tool for process modelling and one of the oldest.



5.2 SOLUTION & TECHNICAL ARCHITECTURE



5.3 USER STORIES

6. PROJECT PLANNING & SCHEDULING

- **6.1 SPRINT PLANNING & ESTIMATION**
- **6.2 SPRINT DELIVERY SCHEDULE**
- 6.3 REPORTS FROM JIRA

7. CODING & SOLUTIONING

- **7.1 FEATURE 1**
- **7.2 FEATURE 2**
- 7.3 DATABASE SCHEMA

8. TESTING

8.1 TEST CASES

A test case has components that describe input, action and an expected response, in order to determine if a feature of an application is working correctly. A test case is a set of instructions on "HOW" to validate a particular test objective/target, which when followed will tell us if the expected behavior of the system is satisfied or not.

Characteristics of a good test case:

• Accurate: Exacts the purpose.

• Economical: No unnecessary steps or words.

• Traceable: Capable of being traced to requirements.

• Repeatable: Can be used to perform the test over and over.

• Reusable: Can be reused if necessary.

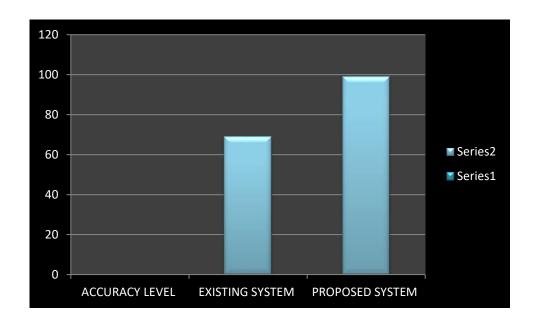
S.NO	Scenario	Input	Excepted output	Actual output		
1	Admin Login Form	User name and	Login	Login success.		
		password				
2	Add train details	Train basic	Added	Train details stored		
		details	successfully	in database.		
3	User Registration Form	User registration	Registered	User registered		
		details	successfully	details are stored		
				in database.		
4	User Login Form	User name and	Login	Login success.		
		password				

8.2 USER ACCEPTANCE TESTING

This is a type of testing done by users, customers, or other authorised entities to determine application/software needs and business processes. Acceptance testing is the most important phase of testing as this decides whether the client approves the application/software or not. It may involve functionality, usability, performance, and U.I of the application. It is also known as user acceptance testing (UAT), operational acceptance testing (OAT), and end-user testing.

9. RESULTS

9.1 PERFORMANCE METRICS



10. ADVANTAGES & DISADVANTAGES

ADVANTAGES

- This system reduces paperwork, time consumption and makes the process of issuing ticket in simpler and faster way.
- And it also gives greater performance.
- System will provide accurate details about the train.
- Easy access to the ticket
- No need of taking out wallet and showing your ticket.

DISADVANTAGES

- This system is helpful to reduce the paper work
- Time consumption and passengers get the metro ticket in simple and faster way.
- The existing system is not comfortable for user.
- Need proper time management system.
- In existing system there is no intimation procedure for delay time and nearby location.

11. CONCLUSION

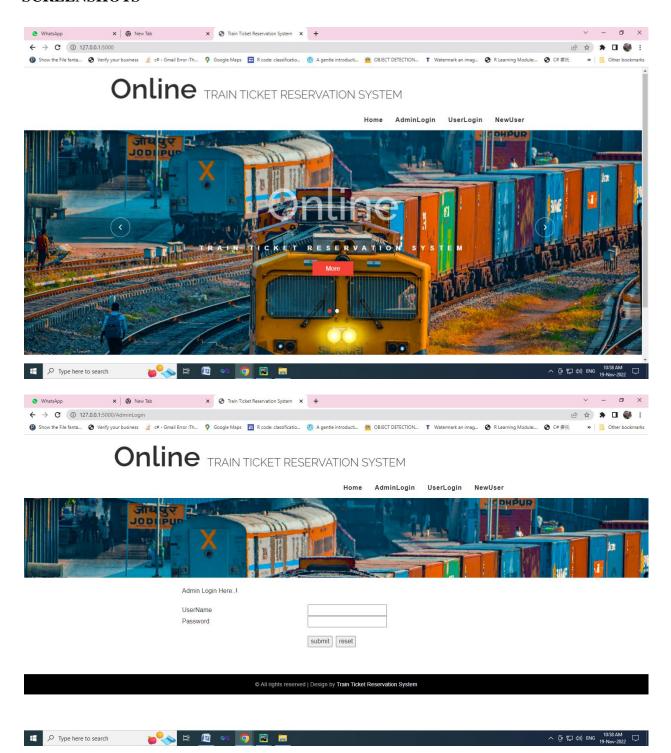
This project entitled as "Railway Management System" has been developed to satisfy all the proposed requirements. The process of recording details about train, user, and booking is more simple and easy. The system reduces the possibility of errors to a great extent and maintains the data in an efficient manner. QR-Code technology would be more easily integrated into existing public transport system infrastructures. Transport system infrastructures. QR-Code provides all the features which make it a valid technology for mass public transport ticketing. The coding is done in a simplified and easy to understandable manner so that other team trying to enhance the project can do so without facing much difficulty. The documentation will also assist in the process as it has also been carried out in a simplified and concise way.

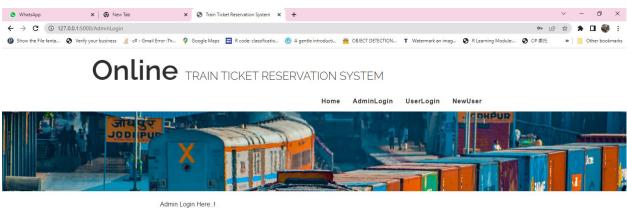
12. FUTURE SCOPE

In future we can develop this project in android application with extra features like railway complaint management system etc. This system is developed such a way that additional enhancement can be done without much difficulty. The renovation of the project would increase the flexibility of the system.

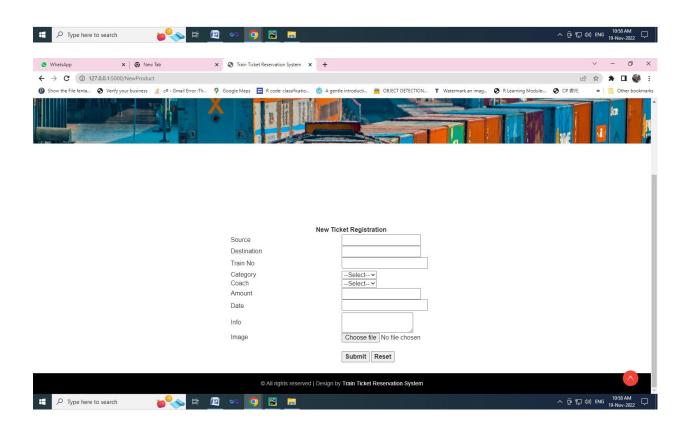
13. APPENDIX

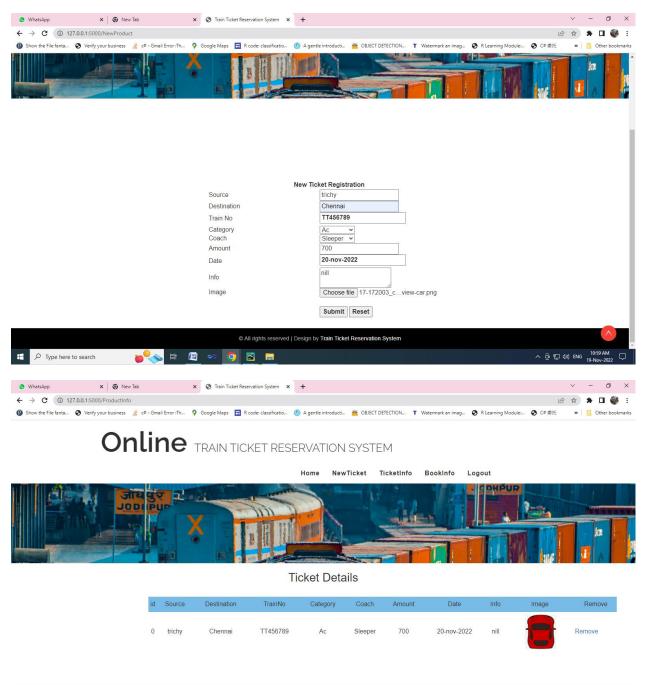
SCREENSHOTS



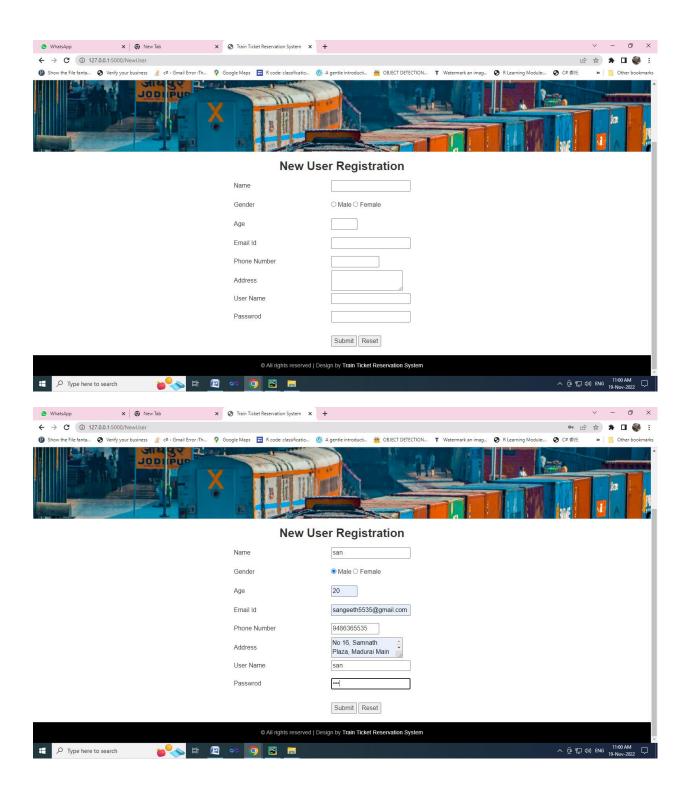


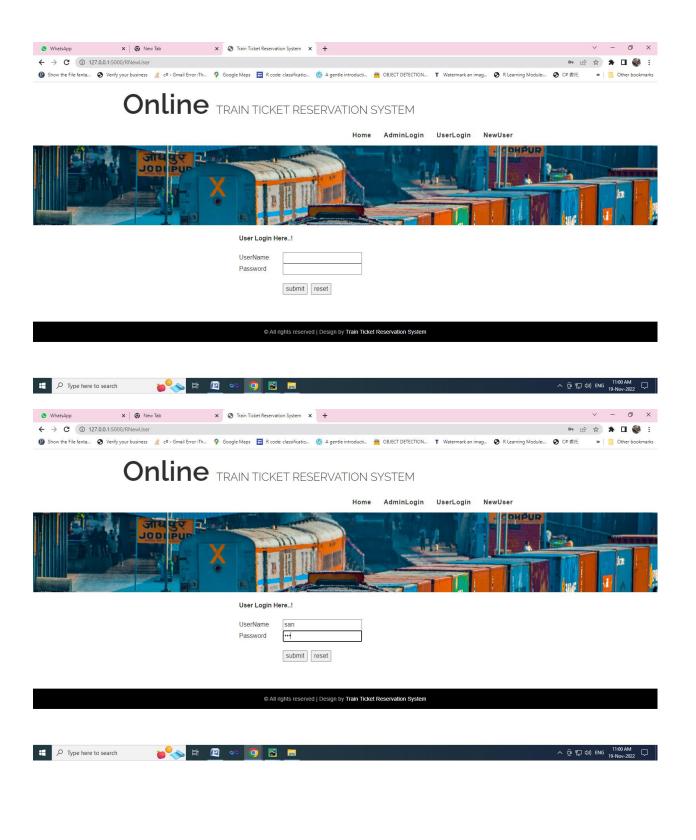
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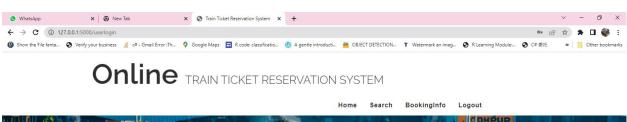










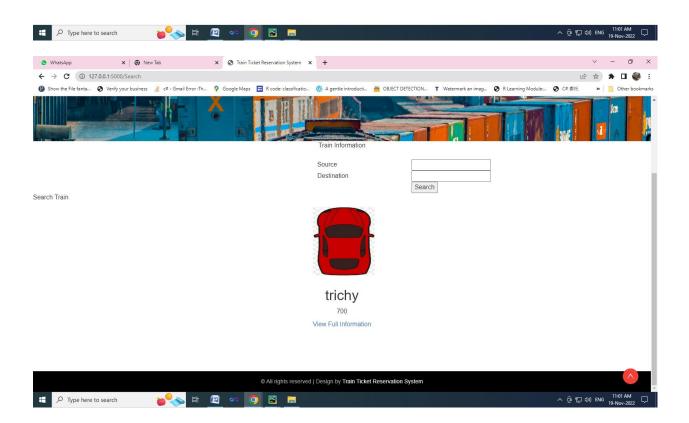


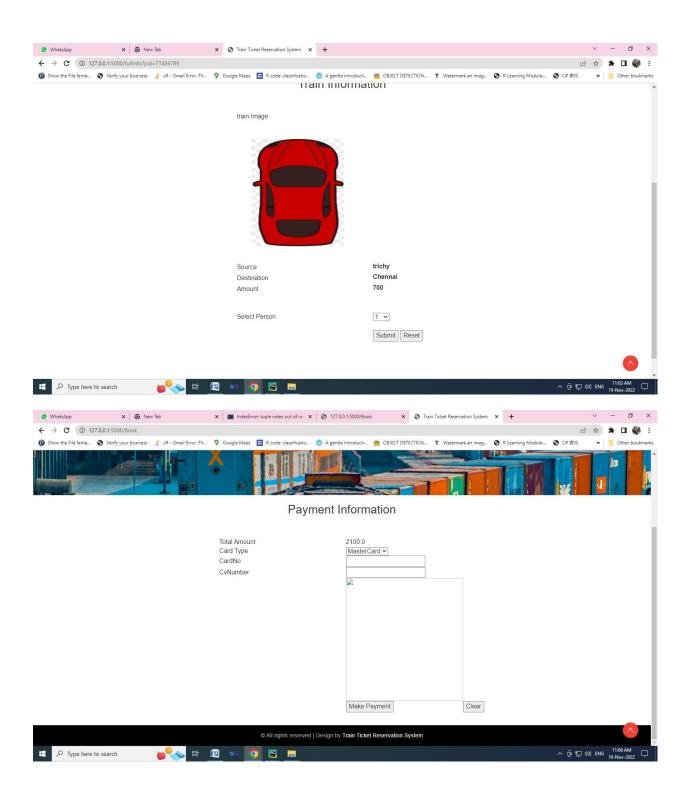


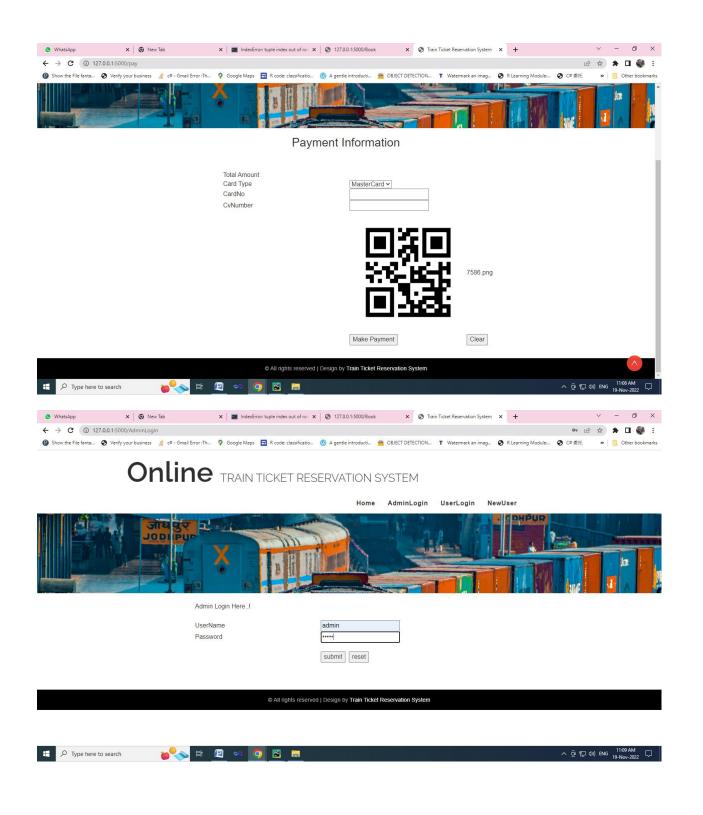
Your Personal Details

Name	Gender	Mobile	Email	Address	
0	san	sangeeth5535@gmail.com	20	9486365535	

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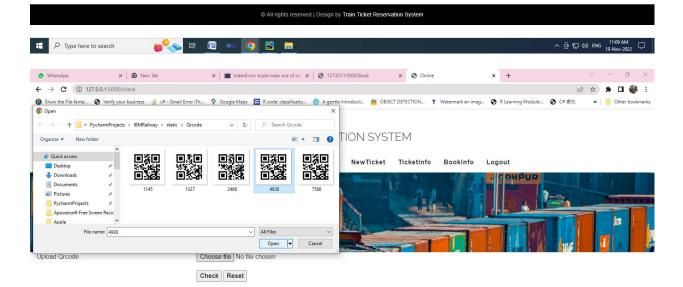


Online TRAIN TICKET RESERVATION SYSTEM



Ticket Booking Details

Id	Ticketid	Source	Destination	UserName	Mobile	Email	Ticket	Amount	date
0	BOOKID001	trichy	Chennai	san	9486365535	sangeeth5535@gmail.com	3	2100.0	19-Nov-2022



Ticket Booking Details

Id	Ticketid	Source	Destination	UserName	Mobile	Email	Ticket	Amount	date
0	BOOKID001	trichy	Chennai	san	9486365535	sangeeth5535@gmail.com	3	2100.0	19-Nov-2022



