

# Implementation of Cloud Computing Technology for M-Ticket Booking

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**Abstract:** *The current railway or bus ticket booking system is human dependent and tedious with regards to the ticket booking process. The core objective of our project is to develop the web-application which will serve as a medium for students/employees/anyone to book the tickets to travel through trains or bus. The principle motive force of this web-application is to ease the process of ticket booking by avoiding the hectic and boisterous process to stand in a queue and book the ticket for the short distance for travelling in the trains. Several applications are available in the market which give information about the travelling destinations and their fares. However, none of these applications incorporate the ticket booking process coordinated for both train and bus. Our application contrasts from such a lot of existing applications as it would book the ticket as well as save the ticket in the cloud database for both train and bus.*

*This website is for railway and bus ticket booking and one can easily validate those booked tickets using mobile.*

*Ticket can be bought with the help of smart phone, laptop using the web-application where your railway tickets can be carried in your phone. The ticketing information of the user is securely stored in the cloud database. Additionally, the ticket checker is given the checker application which is utilized for the approval of the ticket appeared by the user. This framework gives the ticket checker web-application to look for the user's ticket with the ticket number or other appropriate information in the cloud database for checking purposes. Consider that the user's display is being damaged and not able to show the ticket due to other reasons like battery failure we have another safeguard alternative to check the ticket by searching in the ticket database with the ticket number or user's other relevant information for validation purpose.*

**Key Words:** *Ticket Booking, Railway, Mobile, Cloud Database, Ticket Checker.*

## 1. INTRODUCTION:

There has been no advancement in Indian public transport system particularly railways and bus, still follows the regular old pattern of ticket booking and checking. With the growing population, the number of travellers ready to travel day by day is expanding abruptly and now the circumstances are deteriorating that individuals don't bother whether they have a ticket or not, they knowingly or sometimes because of some issue they are entered in the train or bus without a ticket. Indian public transport system and IT are loosely bounded. Presently the use of Information Technology is only limited to online checking of schedules and fares of public transport. The main motive of this web-application is to ease the process of ticket booking by avoiding the hectic process to stand in long queues and book the ticket for the short distance travelling in the trains and bus. Users can purchase the ticket over the Internet, 24 hours a day throughout the year, this solves the issue of bus ticket being misplaced or stolen in a real-life scenario. The application may get overloaded due to a huge number of users visiting at once. Thus to solve the issue this system is built up using cloud infrastructure for improved performance.

## 2. CLOUD COMPUTING:

Cloud Computing [1] is a form of distributed computing which has been evolving recently. Typically, the cloud symbol is used to represent the Internet. Cloud computing is now widely used to describe the delivery of software, infrastructure and storage services over the internet. Cloud computing provides tools and technologies for various parallel applications with far more affordable prices compared to traditional parallel computing techniques.

The main purpose of cloud computing is to profit from all of these technologies without the necessity for deep knowledge or expertise with each of them. At present, whether large or small, all companies depend on public cloud platforms to host and implement applications because they supply flexibility, mobility, scalability, sustainability and it is cost-effective.

**Cloud Computing Service Models** can be mainly placed into three types: SaaS (Software as a Service), IaaS (Infrastructure as a Service) and PaaS (Platform as a Service). Each of the cloud models has its collection of benefits that will meet the wants of assorted companies.

**a) Software as a Service (SaaS):**

Software as a Service (SaaS) [2] is a software distribution model in which applications are hosted by a third-party provider and made available to users over the Internet. The SaaS model enables your business to quickly access cloud-based web applications without committing to install a new infrastructure. Applications run on the vendor cloud, which they can control and maintain. On-site hardware is not required for this model, which keeps associated costs low. This reduces the expense of equipment procurement, delivery and servicing, as well as software licensing, deployment and service. Small businesses may find this cloud platform particularly attractive.

**b) Infrastructure as a Service (IaaS):**

Infrastructure as a service (IaaS) [2] is a type of cloud computing that delivers basic computing, networking, and storage services to customers on-demand, over the Internet. IaaS allows end-users to scale up and reduce resources on an as-needed basis. Infrastructure as a Service (IaaS) is often referred to as Hardware as a Service (HaaS). IaaS [3] was born out of a wider shift from conventional data centres to virtualized and cloud-based infrastructure.

The on-demand service model makes it easy for the user to transfer workloads from one cloud instance to another, ensuring that resources are still available when you need them. IaaS providers offer services on a pay-as-you-use basis. Users are expected to pay for what they have been using.

**c) Platform as a Service (PaaS):**

Platform as a Service (PaaS) [3] is a full cloud-based development and delivery environment with tools that allow you to deliver anything from simple cloud-based apps to sophisticated cloud-enabled enterprise applications. User can buy the services from a cloud service provider on a pay-as-you-use basis and access them through the Internet. PaaS vendors sell a spread of tools that are mainly required for software development, including a source code editor, a debugger, a compiler, and other critical tools. Such methods can be provided together as a platform. PaaS offers all the skills you need to support a full lifecycle of web applications that are designing, reviewing, deploying, managing and upgrading within the same integrated environment.

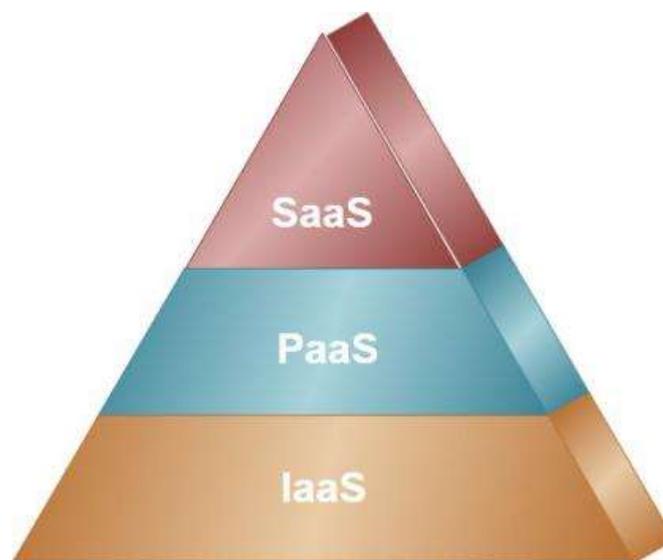


Fig.1. Cloud Computing Service Models .

**3. LITERATURE REVIEW:**

A Study by Mohezar et. al. [5] identified trends in e-tickets among urban communities, especially in Kuala Lumpur. This research explores the trends and patterns of use of e-tickets. The study also focused on consumer perspectives for e-tickets in terms of their usability, reliability, protection, convenience and performance. The research also explores the effect of demographic variables on e-ticket acceptance of e-tickets. A survey was conducted amongst Internet users in Kuala Lumpur. Questionnaires were randomly distributed to 5,000 individuals. Kuala Lumpur was selected to have the largest number of Internet users.

The study found that e-tickets are not a new trend, as an almost good number of respondents have been purchasing online tickets for the past two years and the purchase of rail and bus tickets seems to have dominated online ticketing services. It was also found that comfort and ease of use were among the factors that inspired respondents to buy tickets online.

The study [5] also found that online ticket purchasers are young, qualified and with a higher income bracket, Sahney et al. found that the modus operandi of the online ticket booking system needs particular attention to factors such as the functionality of online search information, website design, and the capacity of all time network availability for online booking. We propose that the flexibility of the Internet should be combined with the convenience of a simplified decision making and collaborative booking from traditional travel agents. The expertise of travel agents should help online customers to find the best travel option under given constraints and provide efficient support for impulsive decision

#### **4. PROBLEM STATEMENT:**

The need to build this website was the technological development of almost everything around us. The user needs all the tasks to be accomplished in an effective and relaxed manner. In such a time, there was a desperate need to construct a website for the convenience of the user. Also, this website will aim to solve the tiresome task of managing the crowd easy, without confusion, during ticket booking times. Cloud Technology will help to add flexibility and scalability.

#### **5. PROJECT MODULES:**

##### **a) Registration:**

This module is meant to record user details on the website database. It collects general information about the user such as name, mobile number, email address, etc. This module also includes a unique Email Id. and Password that would allow the user to sign-in to the website. The information received by the user is recorded in the 'Register' database. Once the user has given all the information needed for registration, the website redirects the user to the sign-in page.

##### **b) Sign-In and Authentication:**

This module facilitates the user to sign-in on to the website. It collects user information, such as email address and password, and compares the information against the entries in the database. If the user entered information that matches the authentication parameters that is email address and password entered during the registration process, the user shall be authenticated and will be redirected to the user homepage. If the user entered information that does not satisfy the requirements for authentication, the user will not be authenticated and cannot access the user homepage.

##### **c) Booking and Allocation:**

This module is available once the user has signed-in onto the website, our application displays two modes of transport to the user that are the train and the bus. User can select any one mode according to his choice. If the user selects train he is prompted with the form where he has to enter his desired selection for booking process, that form includes source station, final destination, train class, train type, number of tickets, route.

Once the user selects these parameters the script code accepts the entries and checks for matching entries in the server database and accordingly displays the fare amount. after that user can go forward and proceed to checkout. Similar functionality is available for bus booking but form choices are different.

##### **d) Transaction:**

This module displays a confirmation message that the user has successfully booked the ticket. It also makes an entry in the transaction database and the unique transaction id is allocated to the user in this module. User can print a ticket in the next step.

##### **e) Admin:**

This module is designed for Ticket-Checker. Firstly, Ticket-Checker must sign-in to use the application. Once he has signed-in, he is provided with the transaction database for both bus and train ticket. The checker can select any one of this option to verify and validate the ticket. In this module the checker is provided with an option to search a particular keyword this will help checker to save time if he has to select any specific entry.

## 6. PROJECT DESIGN :

### Use Case Diagram of M-Ticket Booking System:

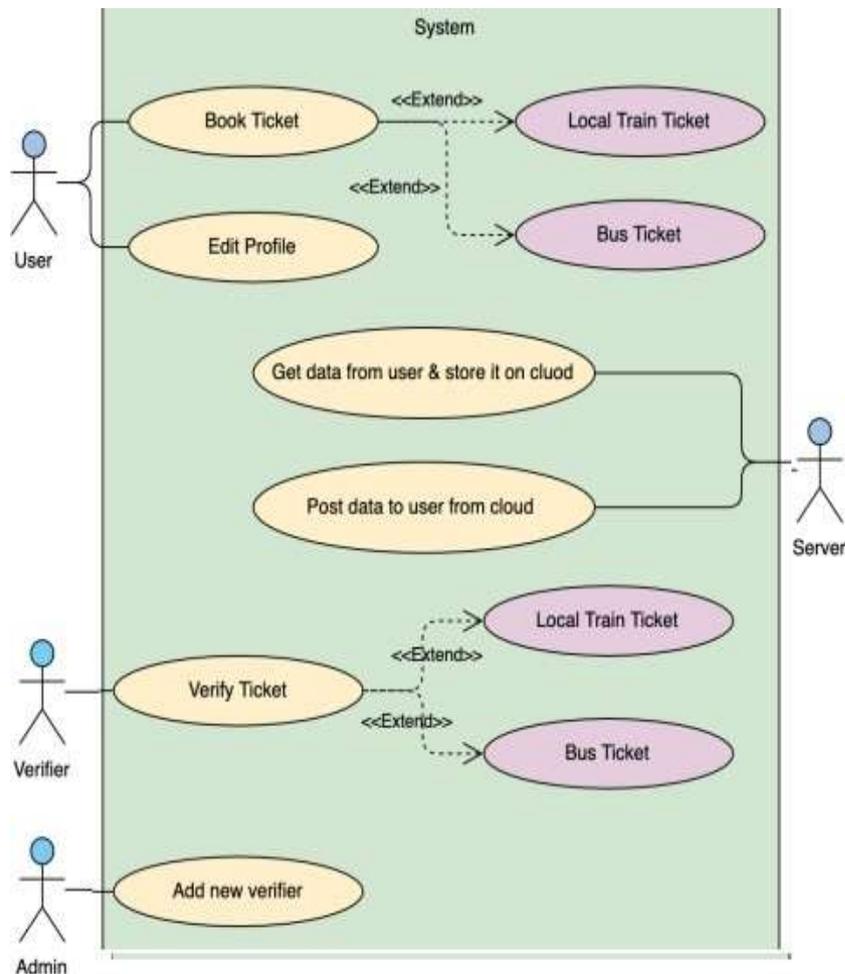


Fig.2. Use Case Diagram .

- **User:** Open web-application in the appropriate browser. Enter desired information to book the ticket.
- **Admin:** Manipulate and manage the system database by adding new bus stops or train stations, removing stops. Adding new Verifier if required.
- **Server:** Takes the desired entries from the user. Calculates the fare by checking in the database. Displays the ticket in a valid format. Post the details of user on cloud with its ticket.
- **Verifier:** Open the web application in the appropriate browser Takes booking id or other relevant information of the user and verifies.

## 7. PROJECT IMPLEMENTATION :

### a) User Activity Flow of M-Ticket Booking System:

User can buy our ticket with the help of a mobile phone or a laptop or any other device which can access a web-application where your tickets are transported on your computer. Firstly, the user has to set up an account to book a ticket. After an account has been established, the user can sign-in using his or her credential.

Our application shows two modes of transportation to the user that are train and bus. Once the user selects one of the options, he has to enter his desired source and destination address. For train, In our system user has to input whether he has to book a ticket for first class, second class. Enter the total number of passengers and type of journey whether single or return. After that our system display the fares. User has to confirm all the details and then he is forwarded to payment gateway. Once the payment process is completed our system prints a ticket and that will be uploaded on the cloud in users account. Similar process for booking bus ticket.

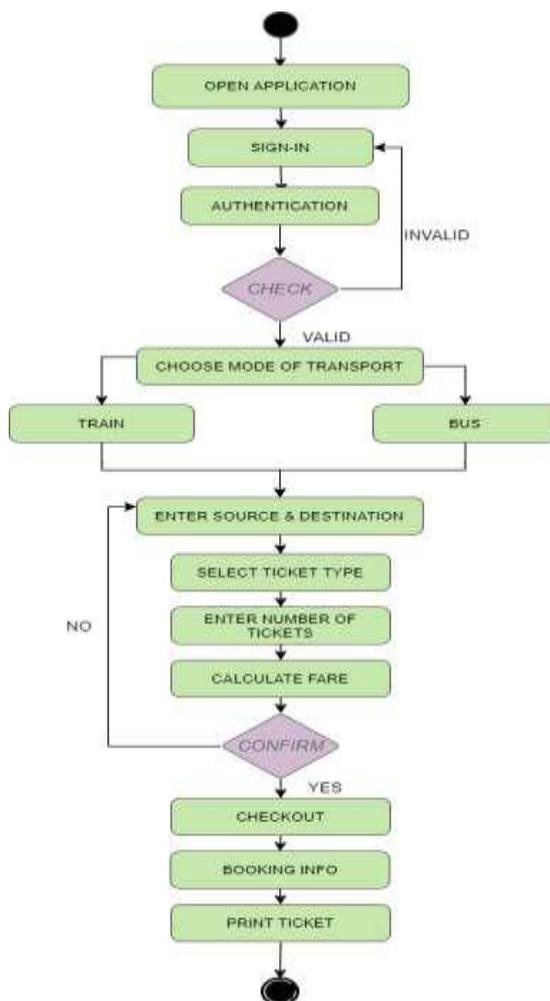


Fig. 3 . User Activity Flow Diagram.

**b) Admin Activity Flow of M-Ticket Booking System:**

Ticket-Checker is equipped with the checker application used for validation of the train ticket or bus ticket. Ticket information for users is stored in a cloud database for security purposes. This web application provides the Ticket-Checker with checker application to search for the user’s ticket with the ticket number or other valid credentials in the cloud database for checking purp

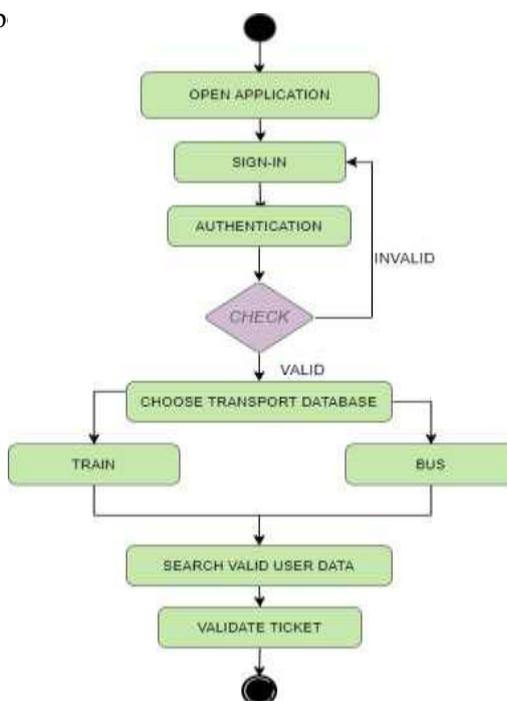


Fig.4. Admin Activity Flow Diagram.

## 8. AMAZON WEB SERVICES (AWS):

Amazon Web Services (AWS) [8] is a division of Amazon that provides on-demand cloud services, tools and Interfaces for users, companies and organizations. Amazon Web Services (AWS) is the most robust and widely accepted cloud platform in the world, providing more than 175 fully integrated data center facilities worldwide.



Fig.5. AWS EC-2



Fig.6. AWS SES



Fig.7. AWS SNS

### a) Amazon Elastic Compute Cloud (Amazon EC2):

Amazon Elastic Compute Cloud (Amazon EC2) [9] is a web service that provides stable, resizable cloud storage capabilities. The basic cloud service interface of Amazon EC2 helps you to receive and customize a minimal congestion capability. It provides a wide variety of instance forms tailored for various use cases. Types of instances provide a range of combinations of CPU, memory, storage, and networking capacities, which give you the flexibility to choose the best mix of resources for your applications.

### b) Amazon Simple Email Service (Amazon SES):

Amazon Simple Email Service (Amazon SES) [11] is a cloud-based email delivery service designed to help digital marketers and software developers submit advertising, confirmation and transactional emails. This is a secure, price-effective tool for enterprises of all sizes that use email to keep in touch with their users.

### c) Amazon Simple Notification Service (Amazon SNS):

Amazon Simple Notification Service (Amazon SNS) [10] is a highly accessible, reliable, stable, fully managed messaging service that lets you to decouple microservices, distributed systems, and serverless applications.

Amazon SNS provides high-throughput, push-based, multi-to-many messaging topics. It offers a low-cost infrastructure for the mass distribution of messages, mainly to smartphone users.

## 9. RESULTS AND DISCUSSIONS:

The web application M-Ticket booking system was developed using Hypertext Markup Language (HTML), Cascading Style Sheet (CSS), PHP Hypertext Preprocessor (PHP), Structure Query Language (SQL), Bootstrap Theme, JavaScript, Datatables.

### a) Application Home Page:

The web application home page displays the ticket booking menu. It also displays the login page for current users at the top of the application and a path for new users to register quickly onto the application.

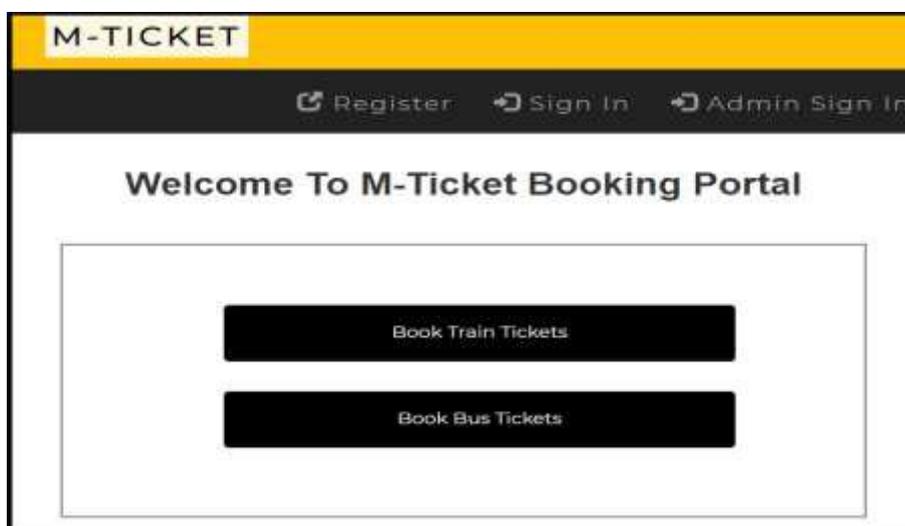


Fig.8. Application Home Page.

**b) User Home Page (after the user has signed in):**

The user home page has the header which has options such as Train Ticket, Bus Ticket, User Bookings and displays users name and has log out and my profile options in drop down list. The body of user home page has a menu which has two options which are Book Train Ticket, Book Bus Ticket, respectively.

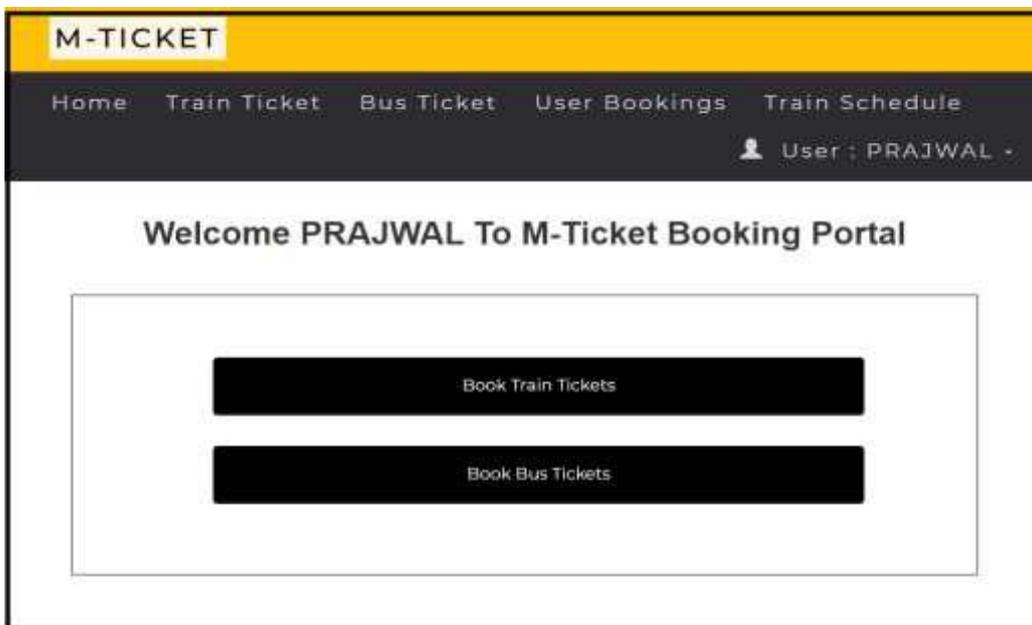


Fig.9. User Home Page.

**c) Train Ticket Booking Page:**

The Train Ticket Booking page has the header which is similar to that of User Home Page, The body of this page has a form which has contents such as Source Station, Destination, Type and Class of Ticket, Total Passengers. User can select these form variables according to his choice.

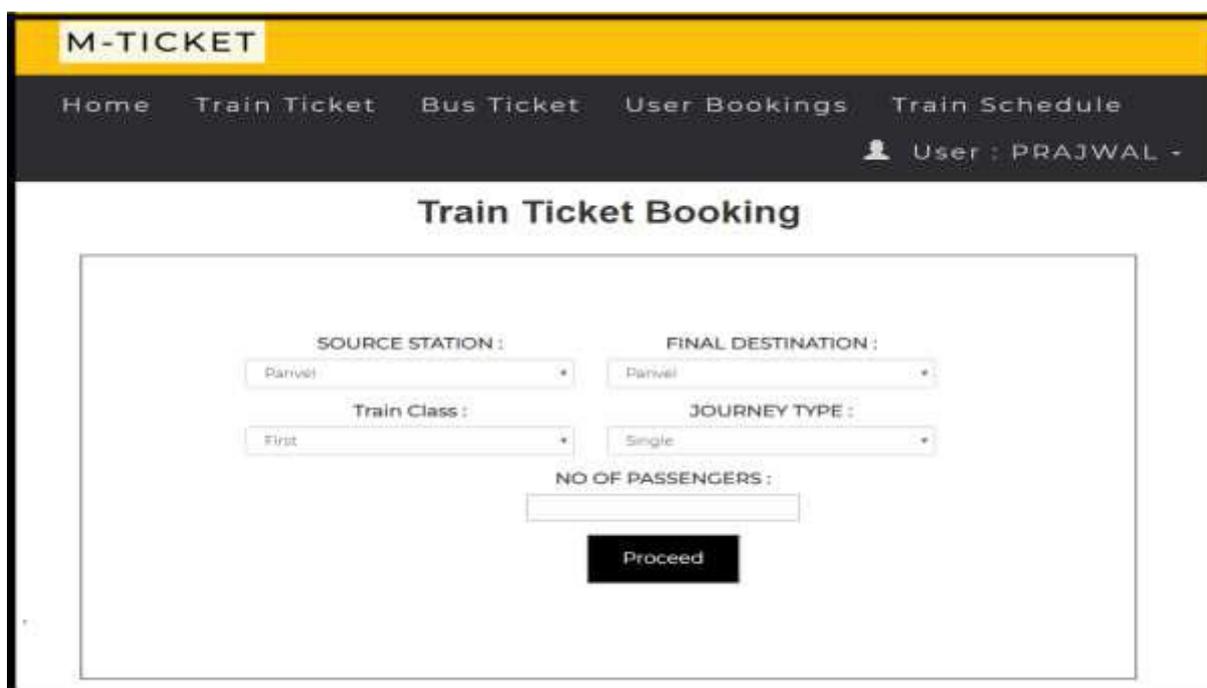


Fig.10. Train Booking Page

**d) Checkout Page:**

The Checkout page has the header which is similar to that of User Home Page, The body of this page displays the Route and Fare according to user choice, user can check out if he is satisfied by displayed fare. The checkout page also has a Go Back option which will head the user to Train Ticket Booking Page.

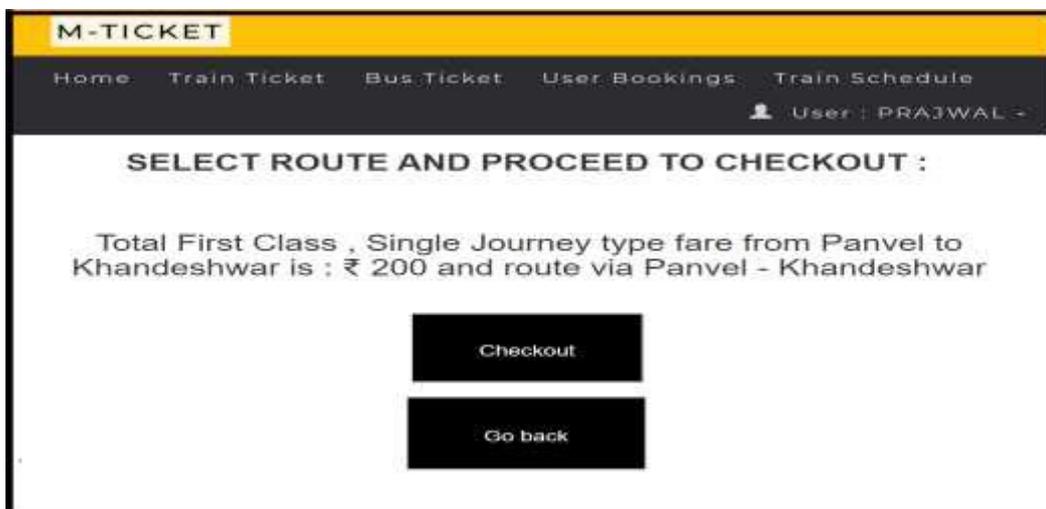


Fig.11. Checkout Page.

**e) Payment Gateway Page:**

The Payment Gateway Page has the form where user has to enter his card details to complete the ticket booking process.

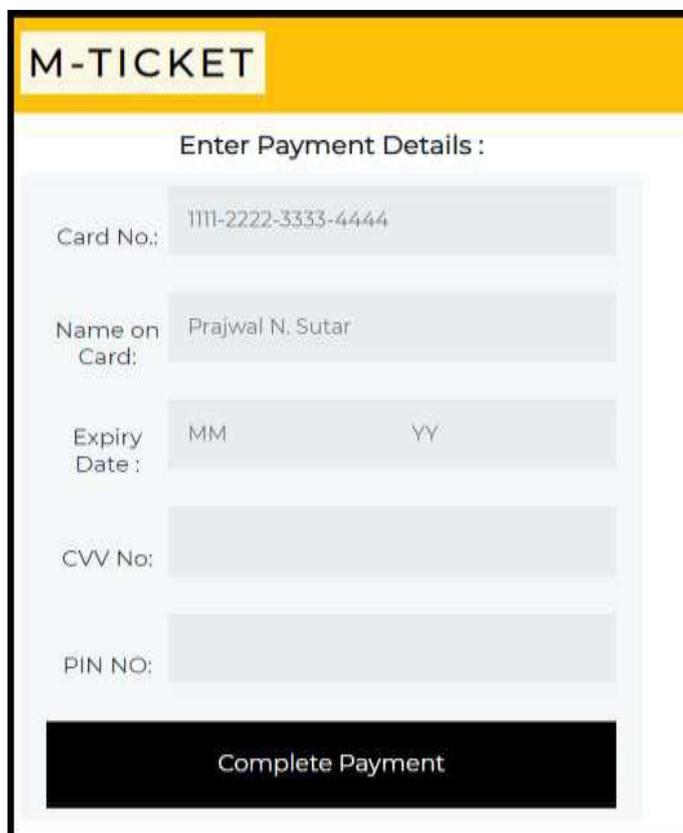


Fig.12 .Payment Gateway Page.

**f) Booking Info and Print Ticket Page:**

This page is displayed after payment is completed, it show- cases the ticket booking information that the user has selected and allocates a unique transaction id which is known as Booking Id. This page also has a print ticket option which prints the ticket.

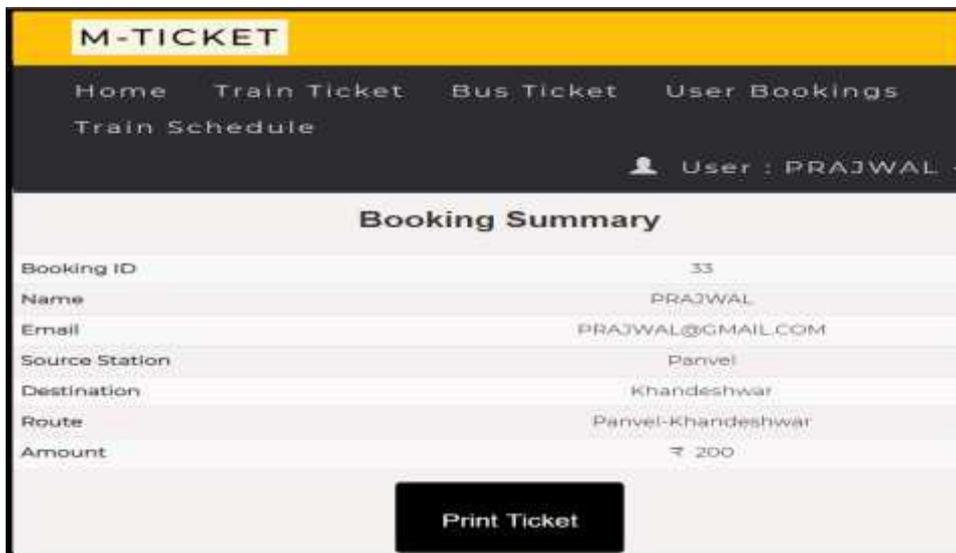


Fig.13.Booking Information Page.



Fig.14. Print Ticket Information Page.

**g) AWS Elastic Compute Cloud:**

Launching Instance having UBUNTU Operating System.



Fig.15. AWS EC-2 Instance Page.

**h) AWS Elastic IP:**

Associating Elastic IP Address to an Instance.

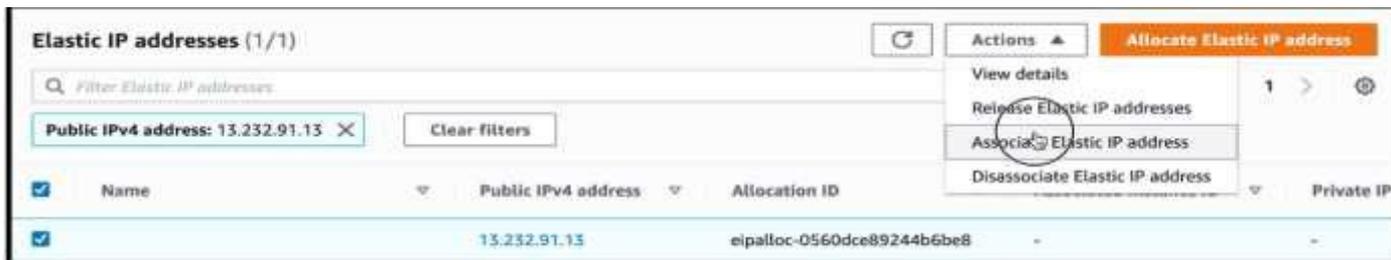


Fig.16. AWS Elastic IP Page.

**i) XAMPP Server:**

Installing and Starting XAMPP Server on Virtual UBUNTU Machine

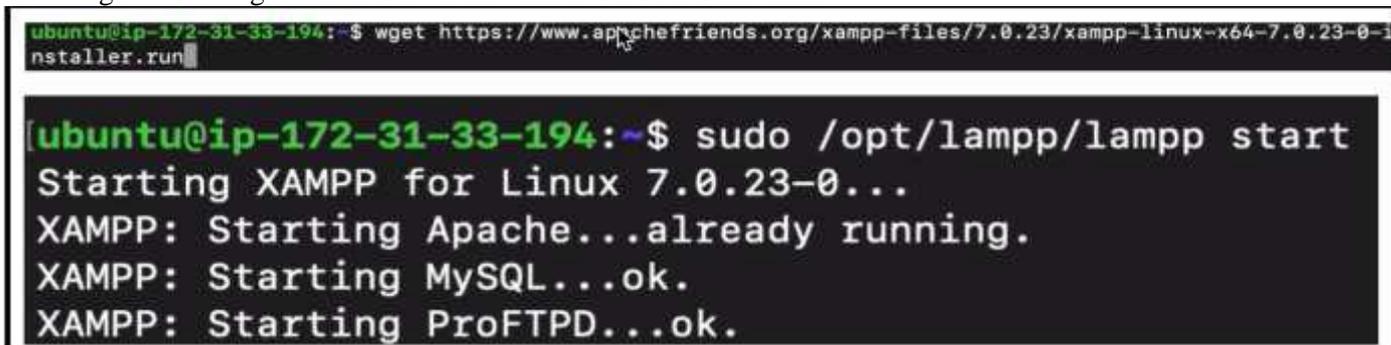


Fig.17. XAMPP Server Information Page.

**j) AWS SES Sending Statistics :**

Amazon SES provides methods for tracking the sending activity.



Fig.18. AWS SES Statistics Page.

**10. CONCLUSION:**

There are many issues in existing railways [6] and bus ticket booking system, To deal over this issue, we are working towards a web-based platform. We have identified the loopholes and started our systematic investigation. Our investigation focuses on these major issues and have put forward a desired result for the same. We have introduced an application on how to secure passenger information. With this experimental analysis, there will be an increased usage of public transport systems, as everything can be done independently. There is no need of any dependence on the conductor or ticket collector while entering into the bus or railways for collecting the ticket, all that we need to do is get a digital ticket by using the web application available in the mobile device and verify it by using users Booking Id or other credentials. This would eventually boost the will of the people and people will use the transport very often. We can visualize that M-Ticket system will have an application portfolio with a mix of cloud-based services delivered across a combination of private, hybrid, and public cloud-based infrastructure deployment models. Thus, using cloud

computing technology in train and bus system is the most efficient, cost-saving, time-saving and serializable technique for waiting ticket holders.

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