COLLEGE OF APPLIED BUSINESS AND TECHNOLOGY

Kathmandu, Nepal

(Affiliated to Tribhuvan University)

SOFTWARE ENGINEERING PROJECT REPORT

ON

YATRISEWA

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ABSTRACT

This report focuses on the development of "Yatrisewa.com," an e-commerce mobile application dedicated to book bus tickets online. The project aims to create an efficient and user-friendly platform that caters to the evolving needs of customers in the online platform. The report outlines the goals, constraints, and development methodology employed, utilizing the waterfall model. It examines the effectiveness of various features and technologies in successful e-commerce platforms, emphasizing secure payment systems and intuitive user interfaces. Overall, the report provides valuable insights into the development and future growth of "YatriSewa" as a successful bus ticket booking e-commerce mobile application. A summary of the system's analysis, design, implementation, and testing is also included in the report, along with the conclusion and suggested next steps.

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CHAPTER 1

INTRODUCTION

1.1Project Introduction

"YatriSewa" is an e-commerce website/mobile application dedicated to book bus tickets online. The objective of this report is to delve into the key aspects of "YatriSewa" and explore its significance within the e-commerce landscape.

The project will begin by analyzing the website's overall design and user interface, assessing its visual appeal, ease of navigation, and mobile responsiveness. By understanding the website's user experience, we can gain insights into how "YatriSewa" optimizes the online booking journey for its customers.

The project will delve into the inventory management system of "YatriSewa" We will explore how the platform ensures a diverse and up-to-date collection of bus tickets, catering to various destinations, price points, and customer preferences. The efficient management of inventory plays a crucial role in meeting customer demands and maintaining a competitive edge.

Lastly, the project focus on customer service and support provided by "YatriSewa" Exceptional customer service is essential for building trust, addressing concerns, and fostering long-term customer loyalty. By examining the website's customer service channels, responsiveness, customer service, and dispute resolution processes, we can gauge the level of customer satisfaction and retention.

Overall, this report aims to provide a comprehensive analysis of "YatriSewa" as an e-commerce platform for online bus booking system. By delving into its design, user experience, marketing strategies, inventory management, and customer service, we can gain insights into the website's strengths, areas for improvement, and its impact.

1.2Problem Statement

The traditional retail industry is facing challenges with the rise of online shopping. In the ticket booking industry, there is a problem because there are just few specialized e-commerce platforms just for booking tickets. This affects both customers and businesses.

For customers, they might face confusion in website layouts or instructions, can make the booking process frustrating, in general some customers might not be familiar with modern technologies. Some systems might have rigid policies on cancellations, seat changes, or adding luggage, making it difficult to adapt to unexpected situations. Real-time data is crucial, so outdated bus schedules, seat availability, or pricing can cause misunderstanding.

1.3Objective

- The following is an overview of the project's main goals:
- Cover the wide range of tickets availability.
- Develop a user-friendly platform.
- Provide accurate product information.
- Facilitate secure transactions.
- Perform regular updates and maintenance.

1.4Limitations

- Challenges in inventory management.
- Building customer trust.
- Difficulties in payment integration.
- Technical constraints.
- Realtime system.
- Limited partnerships.

1.5 Development Methodology

The waterfall model is chosen as the system development model for this project. The waterfall model is a sequential and linear approach to software development, consisting of distinct phases that progress in a predefined order. This model is well-suited for projects with clear and well-defined requirements, where changes during the development process are expected to be minimal.

In the case of developing an online bus ticket booking e-commerce mobile application, the waterfall model offers several advantages. First, it emphasizes upfront planning and requirements gathering, ensuring a comprehensive understanding of the project scope and objectives. This is crucial for an e-commerce platform that requires careful consideration of user requirements, ticket management, payment systems, and integration with other services.

Second, the waterfall model promotes a systematic and structured approach to development, with each phase building upon the previous one. This allows for clear milestones and deliverables, facilitating better project management and progress tracking. For a complex project like an e-commerce web application, having a well-defined and structured development process can help manage the various components involved, such as front-end design, back-end development, database integration, and testing.

Furthermore, the waterfall model's linear nature enables early identification of potential issues or challenges in the development process. By conducting thorough analysis and design phases before implementation, the project team can identify any potential risks or roadblocks and address them proactively. This helps mitigate the chances of costly rework or delays during later stages of development.

1.6 Report Organization

The report is broken down into five sections, of which each provides data on even a separate linked subject.

Chapter 1: This proposed system's introduction part is explained and specified. The introduction, problem statement, objectives, limitations, assignments of roles and responsibilities and report organization are just a few of the sections throughout this chapter.

Chapter 2: The requirements and analysis part for the project has been described.

Chapter 3: Overall system design along with necessary diagrams has been mentioned.
Chapter 4: Implementation and testing details has been explained.

Chapter 5: The overall conclusion along with further enhancement part has been illustrated.

CHAPTER 2

BACKGROUND STUDY & LITERATURE REVIEW

2.1Background Study

E-commerce, short for electronic commerce, refers to the buying and selling of goods and services through digital platforms. An e-commerce mobile application is a software application designed specifically for mobile devices to facilitate online shopping and services. These apps enable users to browse products, make purchases, and manage orders from their smartphones or tablets, enhancing the convenience and accessibility of online shopping.

The concept of e-commerce dates back to the early 1970s with the introduction of Electronic Data Interchange (EDI), which allowed businesses to exchange documents electronically. However, the modern e-commerce era began with the launch of the World Wide Web in the early 1990s. The introduction of secure online payment systems and the development of user-friendly websites in the late 1990s further propelled the growth of e-commerce.

The proliferation of smartphones in the 2000s led to the development of mobile commerce, where consumers could shop on the go. Today, mobile e-commerce applications are a critical component of the digital economy, driving significant growth in online retail sales globally.

E-commerce mobile applications have revolutionized the retail industry by providing consumers with a enhanced shopping experience. The convenience of shopping from anywhere at any time, coupled with features like personalized recommendations, easy payment options, and real-time customer support, has significantly boosted consumer engagement and sales.

In addition to enhancing consumer experience, e-commerce apps benefit retailers by providing valuable data analytics, enabling targeted marketing, and streamlining inventory management and logistics. The global shift towards mobile internet usage underscores the growing importance of mobile e-commerce in driving business growth and customer loyalty.

2.2Literature Review

The research scope of this study is to design and develop an e-commerce mobile application for booking bus tickets online. The focus is on creating a user-friendly platform that enhances the online ticket booking experience, caters to the customer's needs, and drives sales. The research aims to identify challenges and limitations associated with designing an effective e-commerce mobile application for bus ticket booking and propose solutions to address these issues. The scope also includes exploring best practices and existing literature in the field of e-commerce to inform the design and development process.

This report provides an in-depth analysis of the project involving the design and development of

an e-commerce mobile application for booking bus tickets. It explores the ticket market, competitors and business goals. The report also highlights key findings related to customer behavior, app design, user experience and trust in online ticket sales.

The report outlines the limitations and challenges faced in designing the e-commerce web mobile application. These limitations include factors such as limited ticket inventory, building customer trust, competition in the market, security risks, technical issues, and so on. Each limitation is discussed in detail, providing insights into the potential impact and ways to mitigate the challenges. The proposed solutions and recommendations provided in the report offer strategies for overcoming the identified limitations. These include implementing robust security measures, enhancing the user interface and navigation, and integrating personalization and recommendation systems. The report also emphasizes the significance of collaboration with multiple industries to enhance the availability of tickets and attract a significant customer base.

Overall, this report serves as a comprehensive guide for the design and development of an e-commerce mobile application for booking bus tickets. It provides insights into the market dynamics, user preferences, and best practices to create a successful online platform that meets customer needs, differentiates itself from competitors, and achieves the desired business objectives. This literature review highlights the significant advancements and challenges in the field of e-commerce mobile applications. Addressing the identified gaps through further research will contribute to the development of more effective and user-centric e-commerce mobile applications.

CHAPTER 3

SYSTEM ANALYSIS

3.1 Requirement Analysis

3.1.1 Functional Requirements

Essential features and capabilities define the functional requirements of an online bus ticket booking mobile application. These requirements shape the application's development, ensuring it meets customer expectations and delivers a seamless ticket booking experience. By understanding and addressing these requirements, the application can enhance usability, satisfaction, and business success. Some functional requirements for this project are listed below:

- User Registration and Authentication
- Ticket Details and Descriptions
- Reserved Seats and Checkout
- User Friendly Payment Environment
- Customer Reviews and Ratings
- Customer Support
- Booking Management

Use Case Diagram

The system's Use Case Diagram shows the different actions users and admins can perform and their relationships to the system. It helps with requirements gathering, system design, and stakeholder communication.

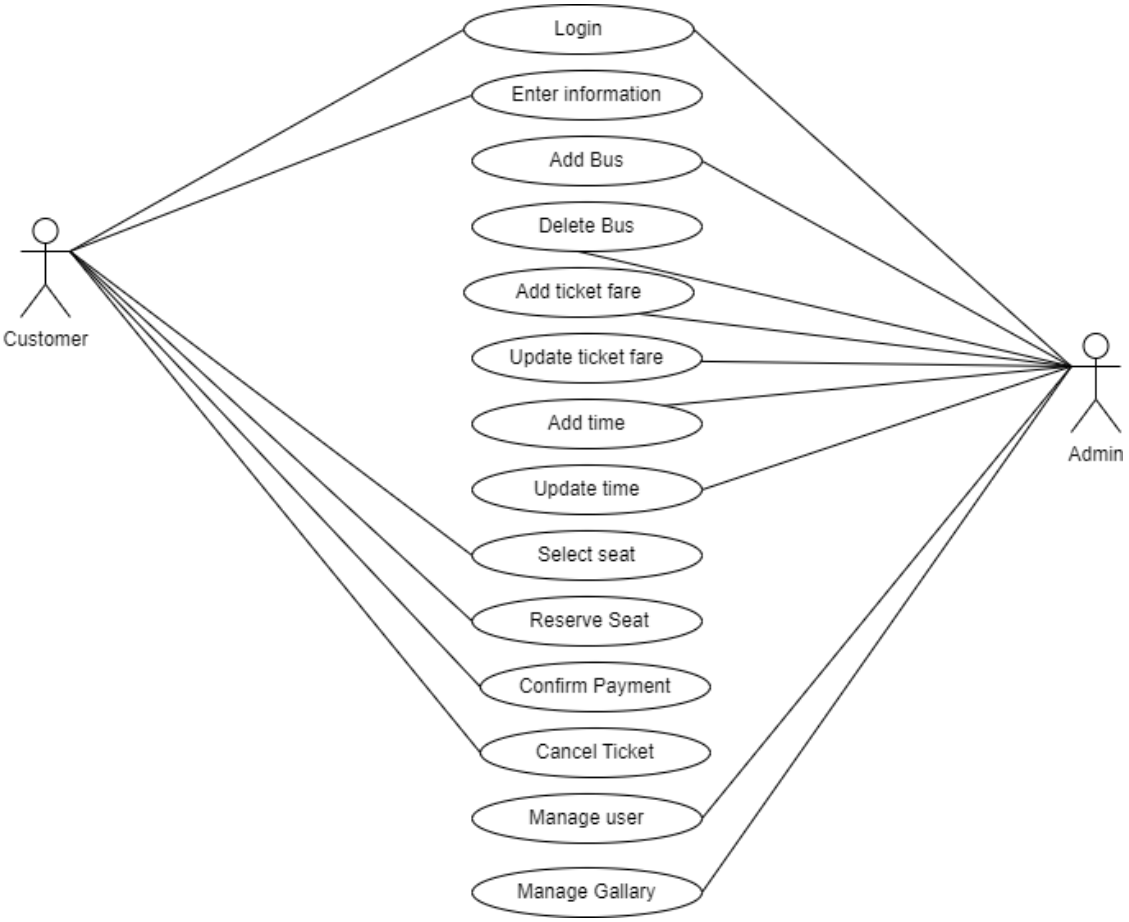

Figure 1.Use Case Diagram

3.1.2 Non-Functional Requirements

- **Usability:** The system ha**s** a user-friendly interface, with intuitive navigation and clear instructions, to ensure ease of use for both customers and administrators. It provide**s** a seamless and pleasant user experience.

- **Reliability & Availability**: The system **is** highly reliable and available, ensuring minimal downtime and uninterrupted access to the e-commerce application. It **has** robust backup and recovery mechanisms to prevent data loss and ensure system stability.

- **Performance**: The system **is** able to handle a large number of concurrent users and process transactions efficiently. It provide**s** fast response times, quick page loading, and smooth browsing and checkout experiences to ensure optimal performance.

- **Security**: The system implement**s** strong security measures to protect customer data, including personal information, payment details, and booking history. It ha**s** secure authentication and authorization mechanisms, encryption protocols, and robust protection against common security threats.

- **Scalability**: The system **is** designed to handle future growth and accommodate increasing user traffic and data volume. It **is** scalable and able to handle additional booking listings, users, and transactions without significant performance degradation.

- **Compatibility**: The system is compatible with multiple devices, operating systems, different screen sizes and resolutions and function optimally on 2G, 3G, 4G, and Wi-Fi networks.

- **Maintainability**: The system is built using modular and well-structured code that is easy to maintain and update. It adhere**s** to coding best practices and standards, allowing for future enhancements and modifications.

- **Compliance**: The system adhere**s** to applicable laws, regulations, and industry standards, such as data protection and privacy laws, consumer rights, and e-commerce regulations. It ensure**s** compliance with relevant policies and guidelines to protect customer rights and maintain ethical practices.

3.2 Feasibility Study

We have evaluated the advantages and disadvantages of our method with the aid of such a feasibility analysis. We have used the information throughout this feasibility report as well as its considerations like a stable platform for evaluating where and when to move ahead. Furthermore, it aids in making choices regarding the most appropriate software and hardware combinations:

3.2.1 Technical Feasibility:

We have used the technologies that have been most suitable and reliable to reach the necessary requirements to build this system. The system is easily configurable as it is

created using following technologies:

Programming Language:

.NET: .NET is used for backend development. We have used .NET MVC (Model-View-Controller) for clear separation of concerns, testability, and control over HTML, JavaScript, and CSS, enabling developers to create dynamic, data-driven websites with a clean and maintainable architecture.

Database:

SQL: SQL is used to provide a reliable and efficient way to store, manage, and retrieve large volumes of structured data, such as customer information, ticket details and orders.

Frontend:

HTML: Html is used to structure and define the content of an application.

CSS: CSS is used in our application to style and visually enhance the appearance of HTML elements.

JavaScript: JavaScript is used in application to add interactivity and dynamic functionality to it, enabling features like form validation, real-time updates, and interactive user interfaces.

Bootstrap: Bootstrap is used for the collection of syntax for template design.

System designing Tool:

Draw.io: Draw.io is used for creating use case diagram, class diagram, block diagram and flowcharts.

3.2.2 Economic Feasibility:

With the usage of the available open-source technologies, there are no building expenses involved with this mobile application. This technique is simple to employ and grasp. As a result, spending in testing and training is not necessary. No additional hardware is needed for such a system. The recipient of all this technique does not need any additional equipment. This project is economically viable because its value outweighs its price.

3.2.3 Operational Feasibility:

There is no requirement for instruction to utilize the product because of its user-friendly design. This can be used effectively in a development environment with very little efforts. Since it addresses the challenges associated with traditional bus ticket booking methods and aims to provide a dedicated mobile application for the sale of bus tickets, this approach is operationally viable.

3.2.4 Schedule Feasibility:

We have been able to design and develop the system within the timeframe and there were no schedule constraints and risks during the process.

CHAPTER 4

SYSTEM DESIGN

4.1Database Design

This shown class diagram provides an overview of the database of the system.

Figure 2.Class Diagram

4.2Sequence Diagram

This shown sequence diagram provides an overview of the interaction between objects.

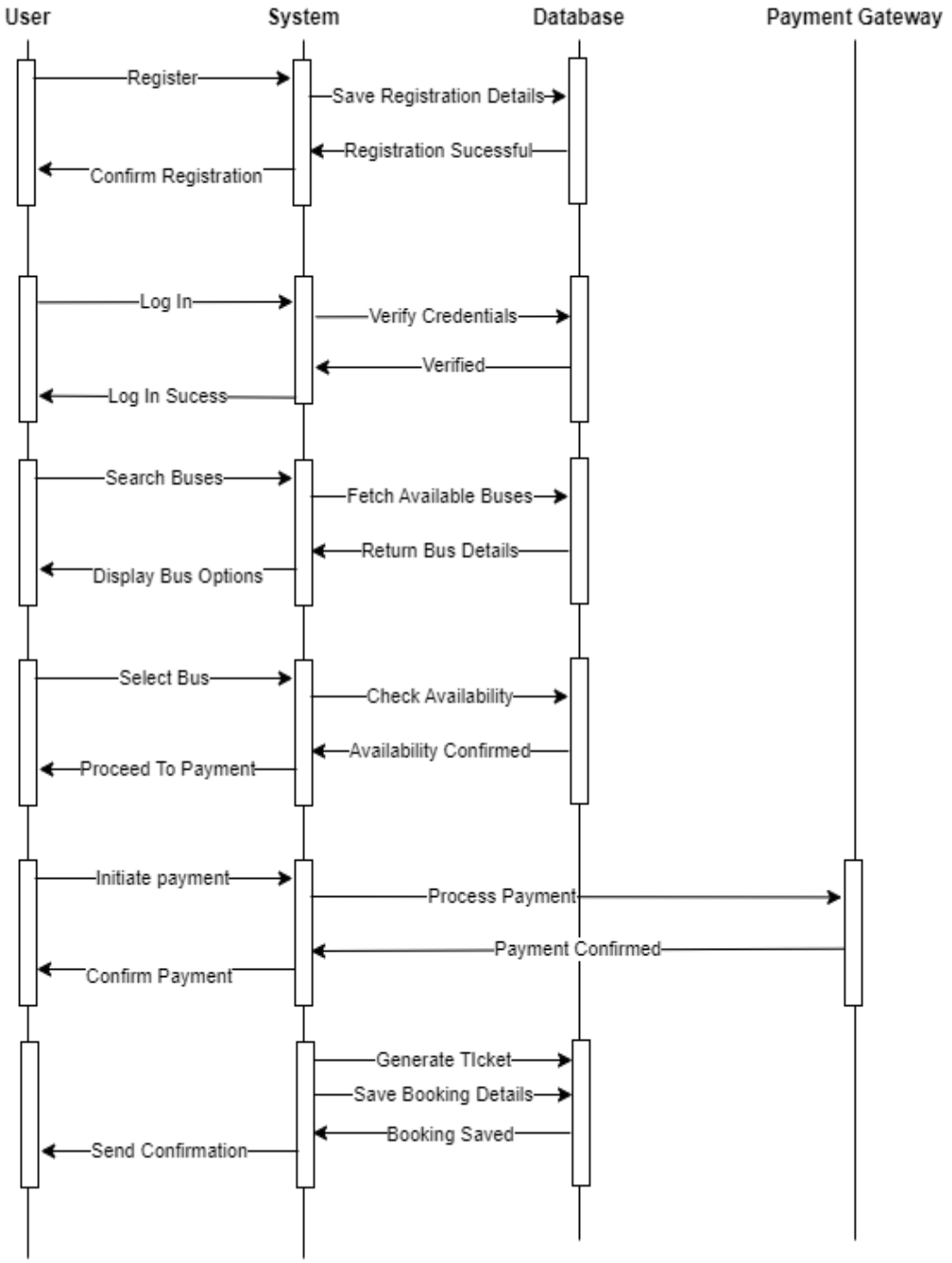

Figure 3.Sequence Diagram

4.3Activity Diagram

This shown activity diagram provides an overview of workflow or business process of the system.

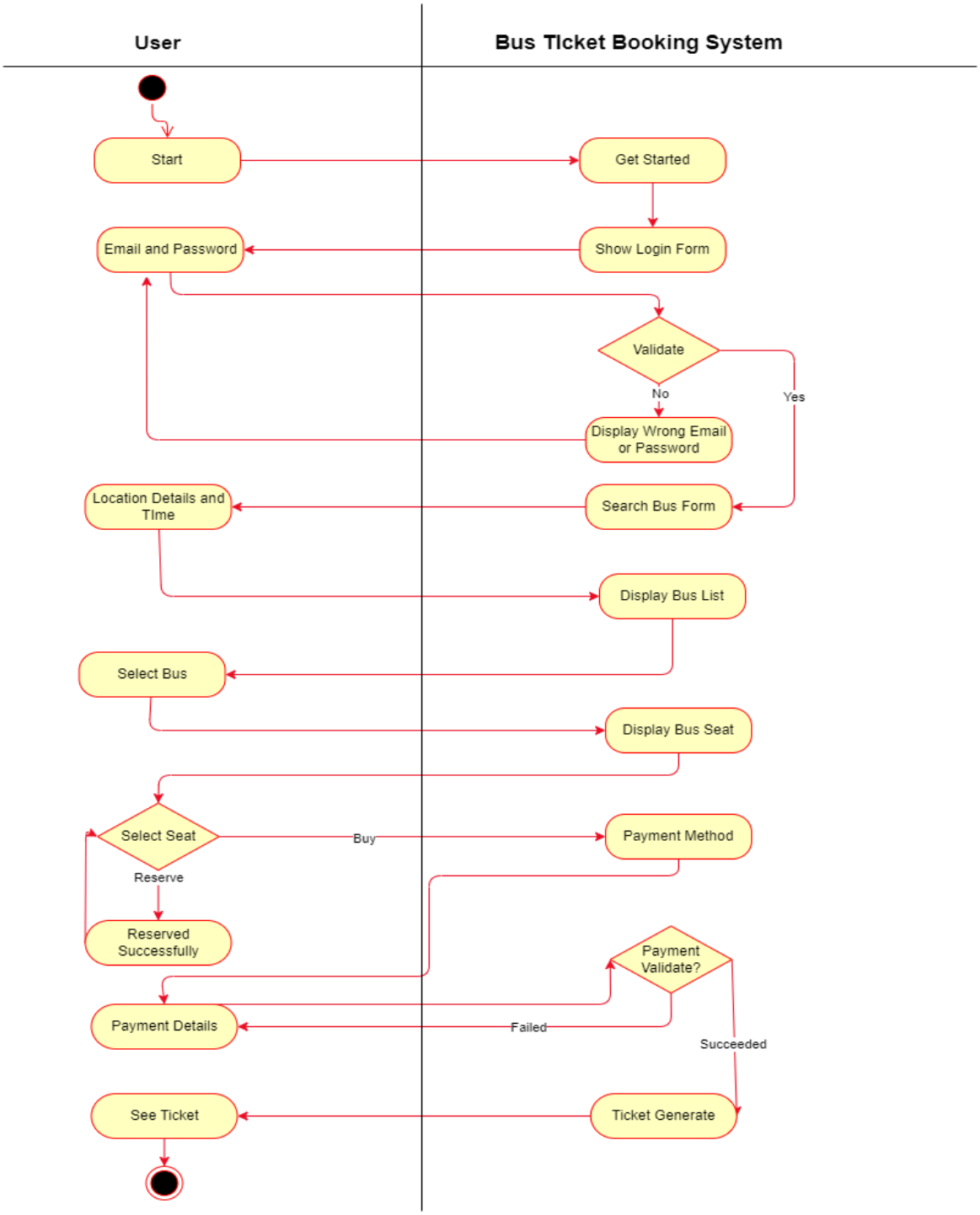

Figure 4.User Activity Diagram

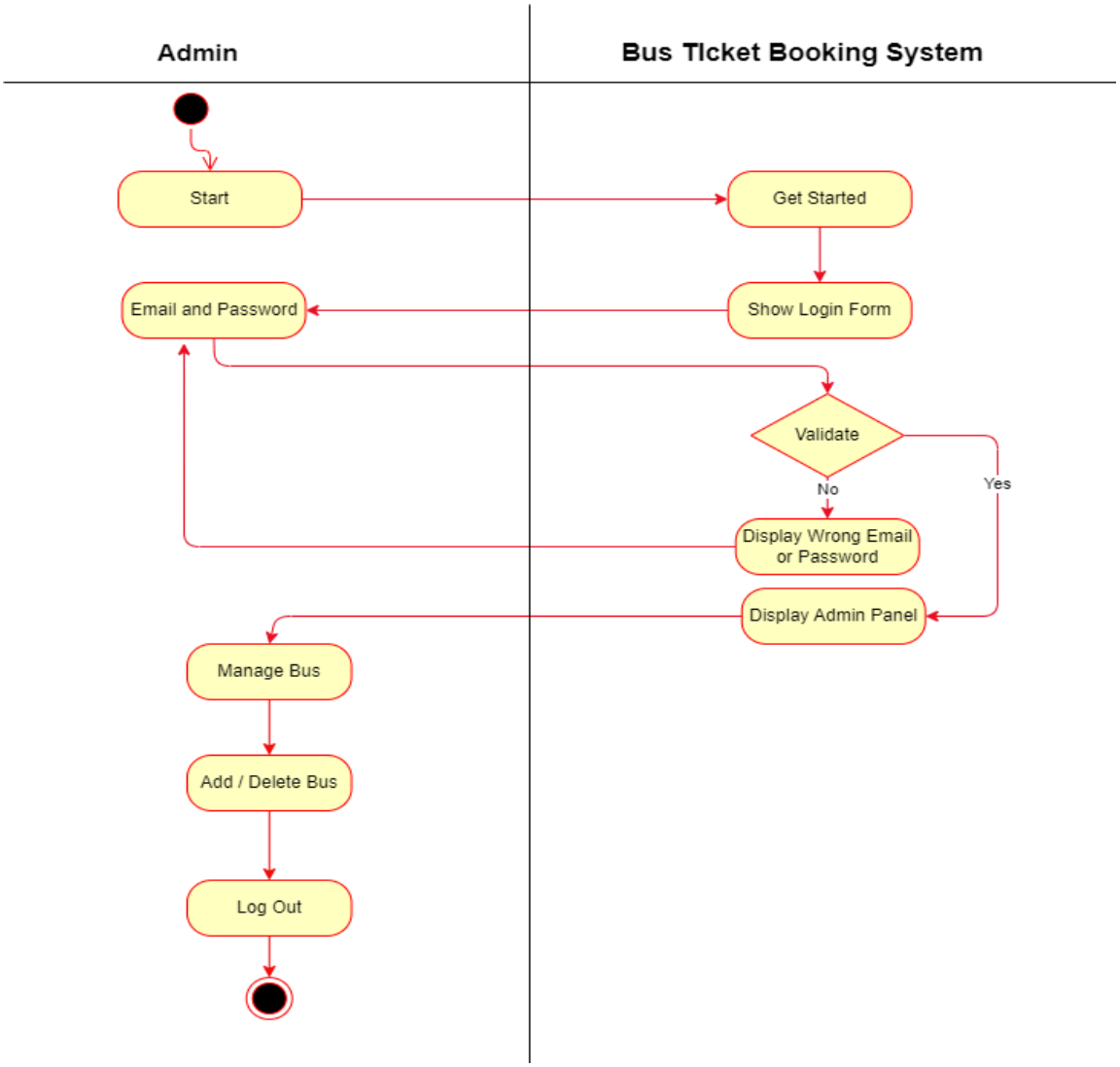

Figure 5.Admin Activity Diagram

4.4Deployment Diagram

This shown deployment diagram provides an overview of the physical architecture of the system.

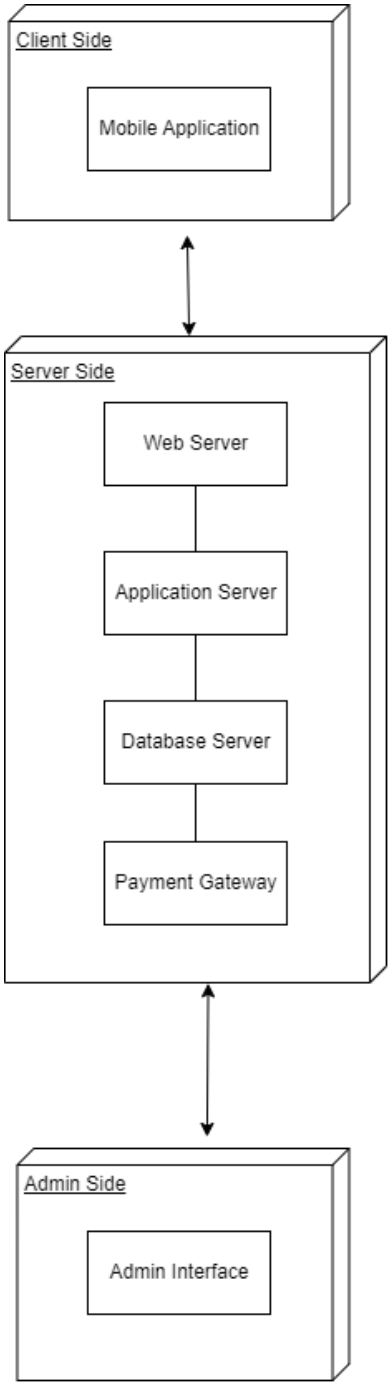

Figure 6.Deployment Diagram

CHAPTER 5

IMPLEMENTATION & TESTING

5.1Tools Used

Multiple tools were employed to create the various diagrams and charts featured in this report, including use case diagrams, sequence diagrams, flowcharts, and class diagrams. Among these, Draw.io was the most commonly used, offering a versatile and user-friendly platform for depicting complex system interactions and structures.

- **Front-end:** Html, CSS, JavaScript
- **Back-end:** .NET
- **Database:** SQL
- **IDE:** Visual Studio
- **Framework:.** ASP.NET MVC
- **Browser**: Google Chrome,Edge

5.2Testing

We have performed multiple testing procedures to insure the quality, functionality and performance of the system to meet the user's expectations.

5.2.1Unit Testing

We employed an instance of input along its related outputs to conduct uniting testing. Unit tests separate a piece of code as well as ensure that it is valid.

Test Case Title: Verifying the Login credentials

TC_ID	**Test case description**	**Expected Output**	**Actual Output**	**Remarks**
TC_01	Verify if user is able to login with invalid credentials.	An error Message should be displayed.	An error Message is displayed.	Pass
TC_02	Verify if user is able to login with valid credentials.	The user should see the successful login and should be redirected towards the Home page.	User is able to login.	Pass

Table 1.Verifying The Login Credentials

Test Case Title: Verifying Registration form.

TC_ID	Test case description	Expected Output	Actual Output	Remarks
TC_03	Enter value that does not follow Email format	An error Message: "Invalid Email Format"	User should receive the error Message.	Pass
TC_04	Enter password ranging less than 6 characters	An error Message: "Password must be 6 characters long"	User should receive the invalid message.	Pass
TC_05	Enter contact number more or than 10 digits	An error Message: "Invalid contact number."	User should receive the invalid message.	Pass

Table 2.Verifying Registration form

5.2.3 System Testing

Test Case Title: Verifying Home Page

TC_ID	Test case description	Expected Output	Actual Output	Remarks
TC_01	Select pick-up point, destination and travelling date.	User should be able to come across list of valid buses based upon entered credentials unless there's no available bus which shows "No Bus Found" message.	User is able to browse through the list of buses to select a bus with preferred facilities.	Pass

Table 3.Verifying Home Page

CHAPTER 6

CONCLUSION AND FUTURE RECOMMENDATIONS

6.1Conclusion

In conclusion, the completion of this project has resulted in the successful development and implementation of a specialized platform for the sale of tickets. Through thorough analysis, effective requirements gathering, and the utilization of a waterfall development methodology, we have overcome the challenges faced by the traditional travel industry in the digital age. The use of c#, along with frameworks like dot net, has provided a solid foundation for building a robust and efficient mobile application.

The system's key features, including user registration, ticket listing, payment processing, and booking management, have been meticulously designed and tested to ensure functionality, performance, security, and usability. By addressing the limitations of existing online ticket booking system, our platform offers a tailored and convenient experience for customers. With the successful implementation of the system, we have laid the groundwork for future enhancements and scalability, positioning our solution as a valuable asset in the ever-evolving digital landscape of the industry.

6.2Future Recommendations

Enhanced Personalization: Implement advanced personalization features to cater to individual customer preferences, such as personalized booking recommendations and tailored marketing campaigns.

Integration with social media: Integrate the ticket booking application with popular social media channels to expand reach and leverage the power of social sharing for increased visibility and customer acquisition.

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APPENDICES

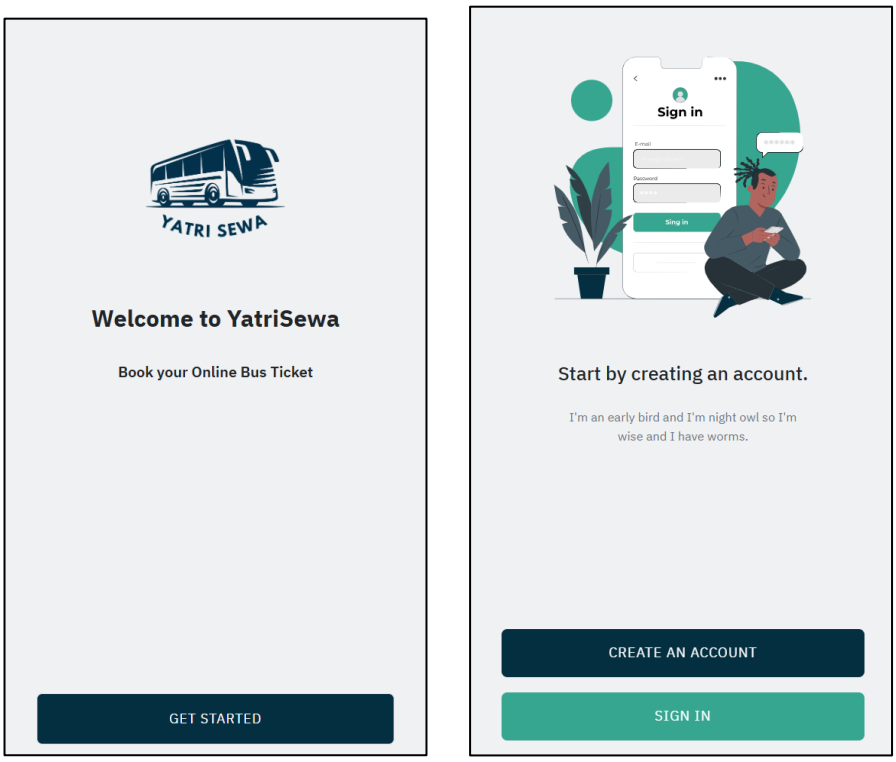

Figure 7.Landing and Get Started Page

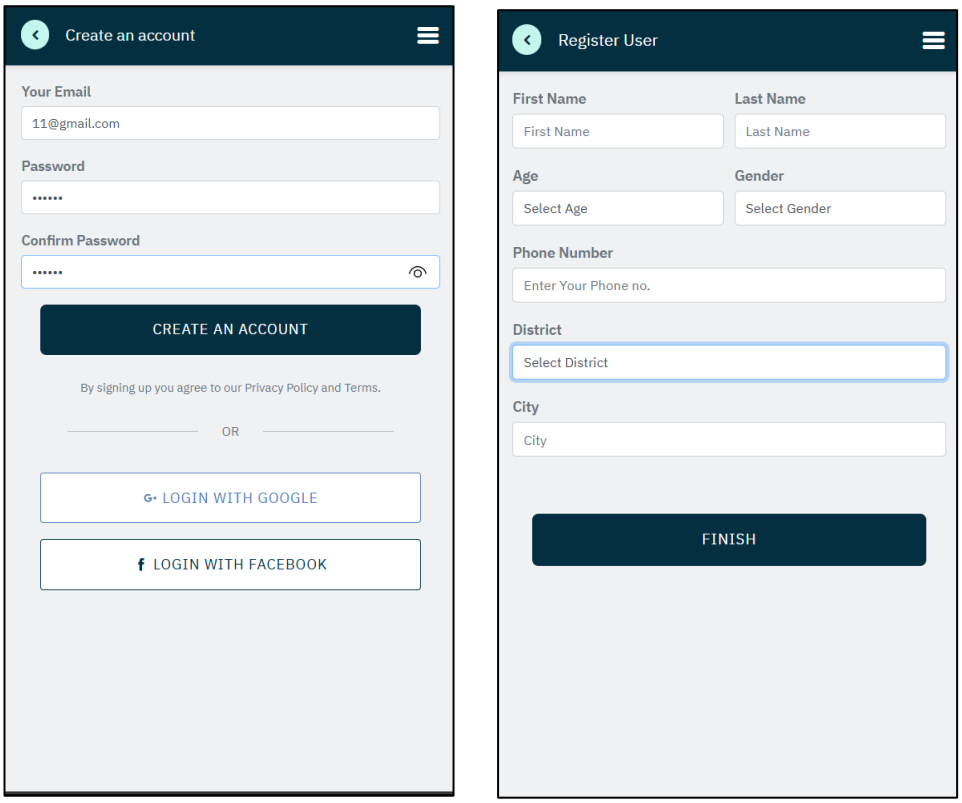

Figure 8.Signup and Register page

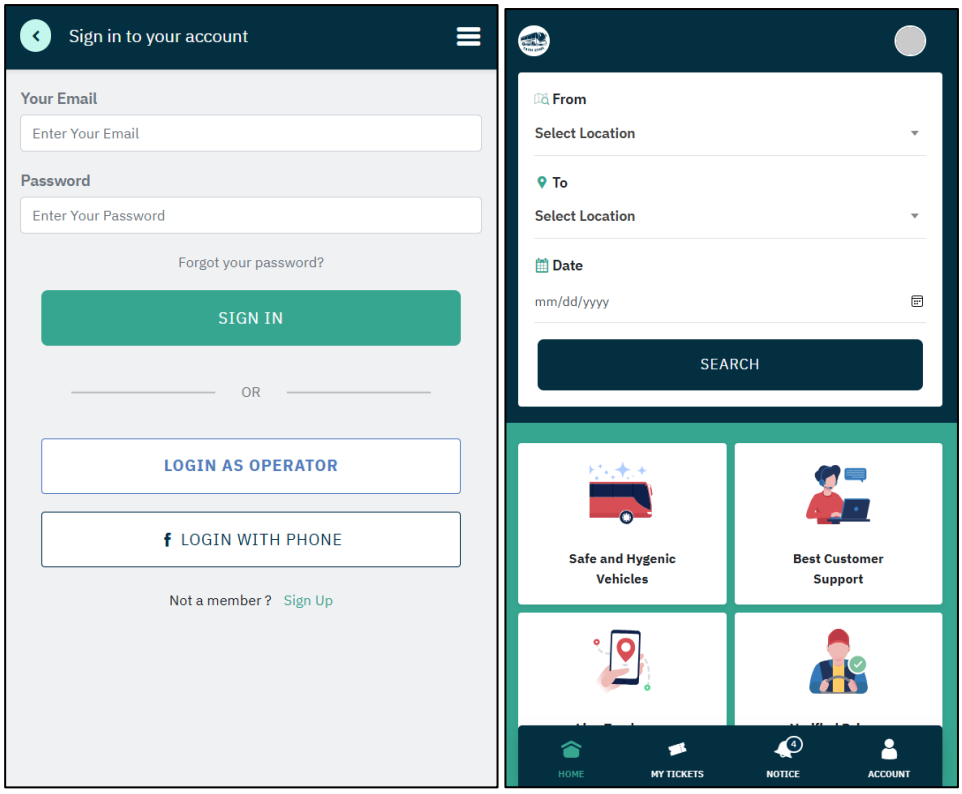

Figure 9: Signin and Home page

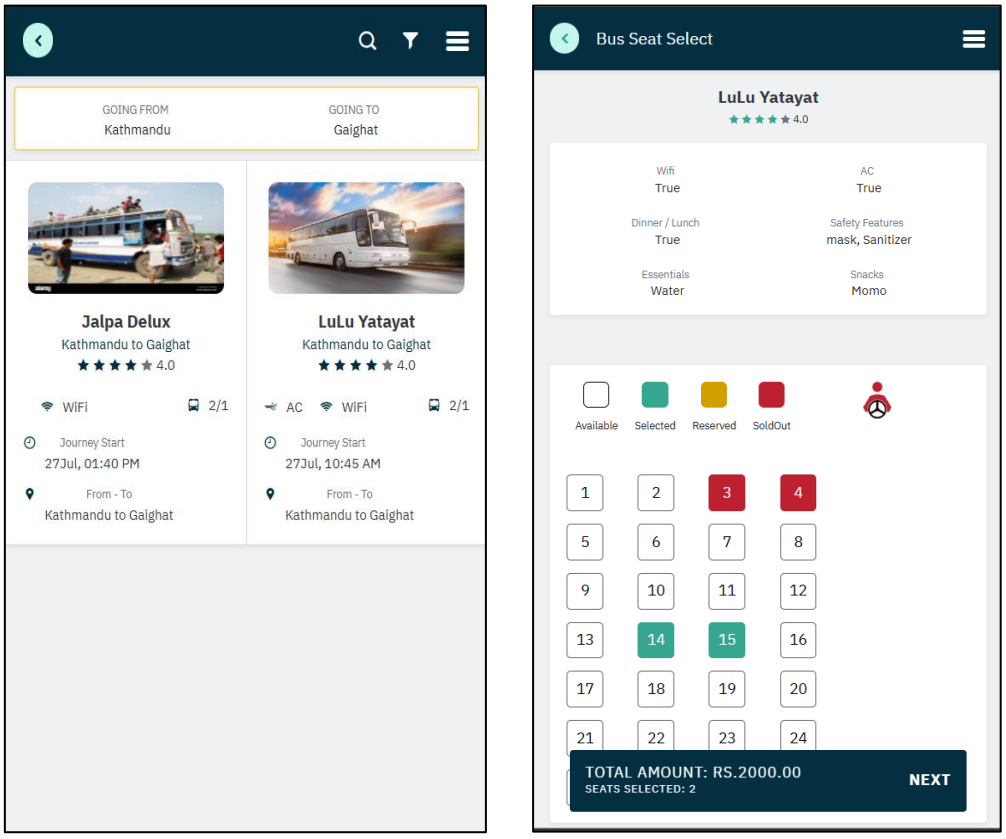

Figure 10.Bus List And Seat Selection

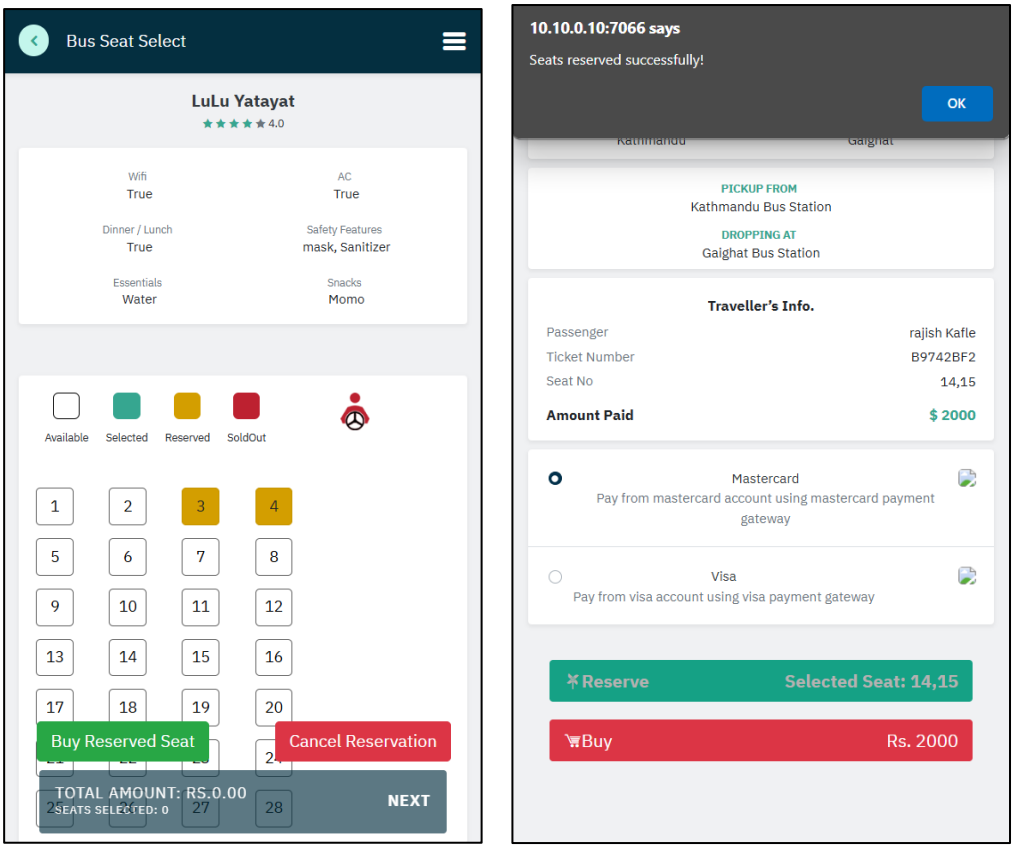

Figure 11.Buy Or Reserve Seat Page

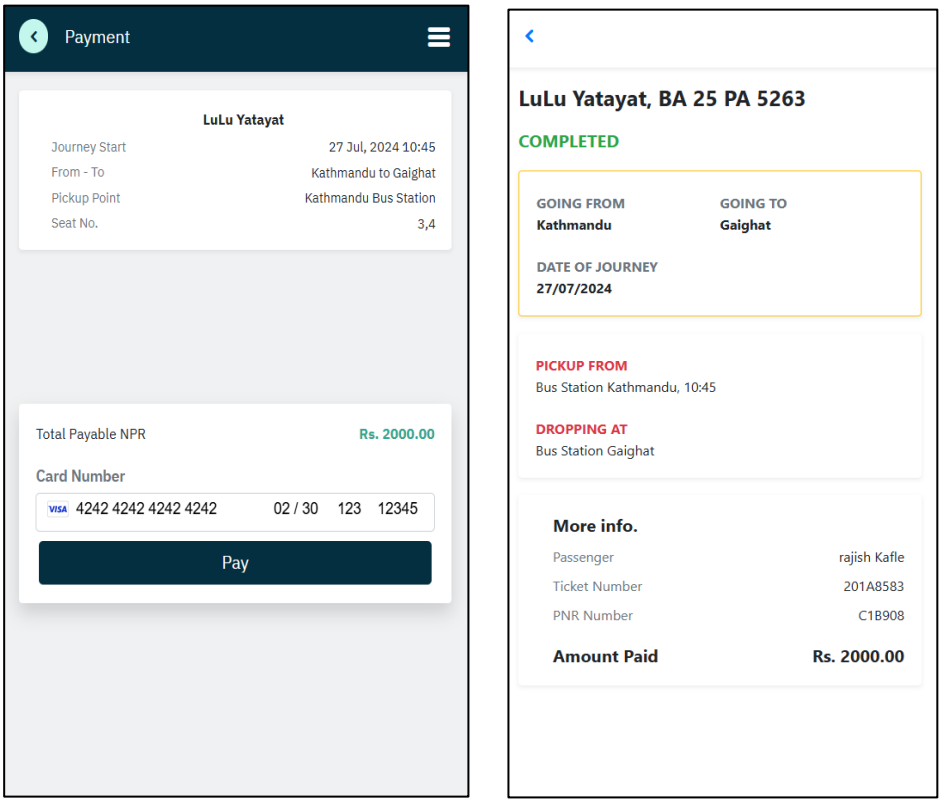

Figure 12.Payment And Ticket Page