DESIGN AND DEVELOPMENT OF WEB-BASED SHIP TICKET BOOKING SYSTEM

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FINAL YEAR DESIGN PROJECT REPORT

This Report Presented in Partial Fulfillment of the Requirements for the **Degree of Bachelor of Science in Computer Science and Engineering**

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May 14, 2025

APPROVAL

This Project titled "**Design and Development of Web-Based Ship Ticket Booking System**," submitted by **Md. Mehedi Hasan Shihab** to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on **14-05-2025**.

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DECLARATION

We hereby declare that this project has been done by us under the supervision of **Mr. Mushfiqur Rahman, Assistant Professor**, Department of Computer Science and Engineering, Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for the award of any degree or diploma.

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ACKNOWLEDGEMENTS

This work would not have been possible without the support and contributions of many individuals over the past two semesters. We are deeply grateful to everyone who has assisted us in one way or another.

First, we express our heartfelt thanks and gratefulness to the almighty for His divine blessing making it possible for us to complete the **Final Year Design Project (FYDP)** successfully.

We are grateful and wish our profound indebtedness to **Mr. Mushfiqur Rahman**, **Assistant Professor**, Department of Computer Science and Engineering, Daffodil International University, Dhaka, Bangladesh. Deep knowledge and keen interest of our supervisor in the field of **Web Design and Development** to carry out this project. His endless patience, scholarly guidance, continual encouragement, constant and energetic supervision, constructive criticism, valuable advice, reading many inferior drafts, and correcting themat all stages have made it possible to complete this project.

We would like to express our heartfelt gratitude to the Head of the Department of Computer Science and Engineering, for his kind help in finishing our project and also to other faculty members and the staff of the Department of Computer Science and Engineering, Daffodil International University.

We would like to thank our entire course-mates at Daffodil International University, who took part in this discussion while completing the coursework.

Finally, we must acknowledge with due respect the constant support and patience of our parents.

ABSTRACT

The opportunity to see new locations and meet new people is one of the main advantage of journey. Along the road new acquaintance will be formed. When traveling alone, striking up a brief chat with a stranger might also help you become more socially adept. The nobility of the people has changed with time. Now people like to travel very fancy and comfortably. People are feeling more familiar and comfortable with internet platforms nowadays. The desire to travel elsewhere is increasing day by day. The life and feelings of travelers are full of endless beauty and essence of the world. Travel increases courage, experience and endurance. So, we have created a new platform for those travelers who enjoy booking online from home to facilitate the travel of those who prefer to travel by sea or on major rivers, or who have to cross rivers and waterways to reach their destination. As a result, they can easily find the point of interest as well as get additional benefits. The name of our online platform is "Ship Ticket Booking System". This "Ship Ticket Booking System" website allows the user to find the seat ticket of any type of ship or easy place Ship and Ship seat, find the seat according to the step of the ship and the user to book the ship according to their destination or book the ship ticket where the user can enjoy himself. It explains how to find a seat on a ship and how to book a ticket where the user can enjoy themselves and easily book a seat ticket in a ship. Usually booking a seat ticket of a ship is very default but users can easily book his place or room online through this website.

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Chapter 1

Introduction

1.1 Introduction

The Ship Ticket Booking System is an innovative solution designed to facilitate the reservation and management of ship travel for passengers. With the increasing demand for efficient and user-friendly travel services, this system aims to digitalize and streamline the process of booking ship tickets, reducing the need for manual procedures and long queues at booking counters. This system allows users to view available ships, routes, schedules, ticket prices, and cabin availability in real-time. Passengers can easily book, cancel, or reschedule their tickets through an intuitive interface. The system also supports secure payment integration, user account management, and automated ticket generation, enhancing both the customer experience and operational efficiency for shipping companies. By incorporating features such as digital ticketing, booking history, and customer support, the Ship Ticket Booking System ensures a seamless and reliable service for both passengers and administrators.

1.2 Motivation

The In today's digital age, where convenience and speed are highly valued, there is a strong need for a modern, automated solution to simplify ship ticket booking. The motivation behind this system is to create a platform that allows users to easily search routes, check availability, compare prices, and book tickets online anytime and from anywhere.

By digitizing the booking process, the system enhances customer experience, reduces administrative workload, and minimizes errors. It also promotes better management of resources, increases accessibility, and helps modernize the maritime travel industry.

In recent years, there has been a significant shift toward digital platforms for

travel booking and management. While air and land transportation have widely adopted online ticketing systems, the maritime transport sector still faces challenges due to outdated and manual booking processes. These traditional systems often result in long queues, booking errors, limited accessibility, and customer dissatisfaction.

The motivation behind developing a Ship Ticket Booking System is to bridge this technological gap and offer a modern, efficient solution that benefits both passengers and shipping operators. By introducing an online platform for booking ship tickets, we aim to enhance user convenience, improve accuracy, and streamline operations. This system not only saves time and effort for travelers but also helps service providers manage schedules, capacities, and transactions more effectively. A ship ticket booking system arose from the need to modernize this process by providing an easy-to-use, reliable and accessible platform. By automating ticket booking, schedule management and payment processing, this system has been developed to enhance the user experience, reduce the management burden and reduce human error.

This project aims to bring convenience to passengers, improve management efficiency for operators, and promote digital adoption within the maritime travel sector.

1.3 Objectives

- Our main goal is to create a website where travelers can get the right guide for booking ship ticket.
- Travelers can easily book their favorite ship port and ship place at home.
- Travelers can get their place guide from our website to prepare for the trip.
- Travelers can get all the information from going on a trip to reaching his residence again.
- Travelers can find their preferred ship port destinations in the self-travel region. They can view the detailed details of their preferred travel area in progress.
- To automate all activities of Ship ticket booking System in booking management.

- Designing a system to eliminate the current manual system of filing, file retrieval problem, and file processing and delivery of progress details to clients.
- Records Ship ticket booking events from source to destination.
- To determine the extent to which an online Ship ticket booking tracking system will help both management and clients.
- Will have a help desk, where travelers can report all kinds of problems.
- Travelers can get excellent customer service.
- You can receive more information on reserving a ship port, ship map, ship ticket booking by contacting the admin.
- Supporting the growth of small businesses.

1.4 Methodology

The development of the Ship Ticket Booking System follows a systematic approach to ensure that the solution is efficient, user-friendly, and meets the needs of both passengers and administrators.

The PHP-coded Laravel platform, which has a MySQL database, offers administrators and users a two-tiered view. Passengers can sign up and self-register, and administrators can add content, manage memberships, and keep an eye on activity. A booking system, a multibooting section, and a secure online payment gateway are among the other features included in the system, which adheres to Laravel's Model View Controller design pattern, which divides business logic from the template layer. To make sure it is dependable, the platform is being tested for unit, integration, and user acceptance. To provide a better, more effective, and more cutting-edge platform for passengers booking ships, the website is expanded and updated with more content once it is deployed.

Passengers can add ship reservations under their own names using this user and administrator interface. Additionally, the administrator has the ability to book tasks for both users and administrators. By reviewing the information provided by the individual listed on the form, the administrator can decide whether to accept or reject a request made by a user. Additionally, they have access to the lists of passengers who have been approved and those who are still pending. Additionally, through the admin section, members can examine every notice that the admin has posted. in order for them to keep track of all the crucial notifications sent to the passengers. No one can access the admin interface unless they are an administrator or have been given permission by the administrator.

1.5 Project Outcome

The development of the Ship Ticket Booking System successfully achieved its primary goal of providing a reliable, efficient, and user-friendly platform for booking ship tickets online. The system automates the entire booking process from route selection and schedule viewing to payment and ticket generation offering a seamless experience for users and simplifying operations for service providers.

Key Outcomes:

User-Friendly Interface: A clean and intuitive interface that allows passengers to easily search routes, view ship schedules, and book tickets.

Automated Booking Process: Eliminated manual work by enabling real-time booking, ticket generation, and confirmation notifications.

Efficient Data Management: A well-structured database was implemented to securely handle user information, schedules, and booking records.

Secure Transactions: Integrated secure login and payment features to ensure safe and smooth transactions.

Scalable Design: The system architecture allows for future scalability, including the addition of new routes, services, and user roles.
Improved Accessibility: Users can access the system from anywhere, reducing the need for physical booking counters and long queues.

As a result, the Ship Ticket Booking System website aims to not only make user booking easier but also to open the door for a more superior, intelligent, and creative online ticketing experience in Bangladesh. As a reference for other organizations interested in embracing the possibilities of an advanced transformative agenda in the digital era in line with the modern world, this effort will revolutionize the development of a new, advanced vision of online ticket booking.

1.6 Report Organization

The purpose of this report is to give a concise and organized summary of the Ship Ticket Booking System project, covering its conception, design, implementation, and effects.

Chapter 1: Introduction

The background and concept of the Ship Ticket Booking System project are presented at the beginning of this chapter, along with an outline of the system and the justification for developing a digital platform for efficient communication as well as membership and engagement management. This document describes the rationale for the project's necessity, its objectives and scope, the platform's development process, and the end outcomes.

Chapter 2: Background

It explains prior applications, other relevant studies, and gives an overview of the context in which this Ship Ticket Booking System program is being created. It also gives the background information for the following suggested fixes and identifies the issues that the Ship Ticket Booking System systems currently need to address.

Chapter 3: Requirements Analysis and Design Specification

This chapter describes context diagrams, data flow diagrams, user interface designs, and information about the system design and the functional and non-functional needs of the website that is being developed. In addition to providing thorough coverage of design and implementation concerns, a project plan also specifies how work will be assigned.

Chapter 4: Implementation and Results

The environment, test scenarios, and evaluation of the Ship Ticket Booking System online deployment are the primary topics of this chapter. It offers a lecture on the effectiveness of the deployment, reports on the outcomes of sample testing, and explains the platform's capability.

Chapter 5: Engineering Standards and Design Challenges

Compliance with software, hardware, and communication standards is covered in this chapter. It looks at the project's ethical concerns and emphasizes its effects on sustainability, the environment, and society. The chapter addresses the challenging engineering issues that arose throughout the development phase in addition to covering life cycle management topics including project management and financial analysis.

Chapter 6: Conclusion

The project is summarized in Chapter Seven, which also covers the thesis's limits and potential avenues for further research. The last chapter summarizes the effects of the change management project on Ship Ticket Booking System program and offers recommendations for further implementation.

Chapter 2

Background

2.1 Introduction

Ship Ticket Booking System is a software application or platform designed to manage and facilitate the booking, reservation, and management of tickets for passengers traveling on ships, ferries, or other maritime vessels. This system can be used by various shipping companies, ferry operators, or cruise lines to handle ticket sales, reservations, and customer management. The system helps streamline operations and improve the overall customer experience by allowing passengers to book their trips online, view schedules, and access various services.

2.2 Literature Review

This literature review focuses on a comprehensive and rigorous examination of current projects in ship ticket booking by various organizations. It presents a summary of significant data, logic and knowledge gaps in this field. The literature review critically evaluates previous studies, identifying unresolved issues and problems that require further research. The development of a comprehensive and dynamic platform for ship travel and passenger convenience stems from the need to address existing gaps and build on previous initiatives undertaken by various organizations. Many previous works in this field, such as Atlantic cruise bd [1], hapag-lloyd [2], have laid the foundation for digitalizing operations but also revealed significant limitations and areas for improvement.

2.2.1 Similar Applications

There are other applications and systems in related sectors that can be compared to the creation of a dynamic, user-centric platform for the Ship Ticket Booking System. These systems are used as models and sources of inspiration for developing more effective and engaging platforms. The following pertinent apps and websites are comparable to your project and include features specifically designed for ticket administration and booking:

1. Atlantic cruise bd Online Portal in Bangladesh.

In Bangladesh, travelers can access ship schedules, ticket details, booking updates, and online booking payments through the internet site run by atlanticcruisebd.com. With features akin to those intended for ship ticket booking, the platform facilitates online registration and places a strong emphasis on community involvement. It acts as a template for combining different features to efficiently assist with booking operations.

Figure 2.2: atlanticcruisebd.com

2. China Hapag-Lloyd Platform.

China's www.hapag-lloyd.com uses a digital platform for ship booking and to manage non-binding activities. These platforms often include registration systems, booking schedules, and access to route monitoring resources. They prioritize ease of use, strong authentication mechanisms, and scalability to cater to a large user base.

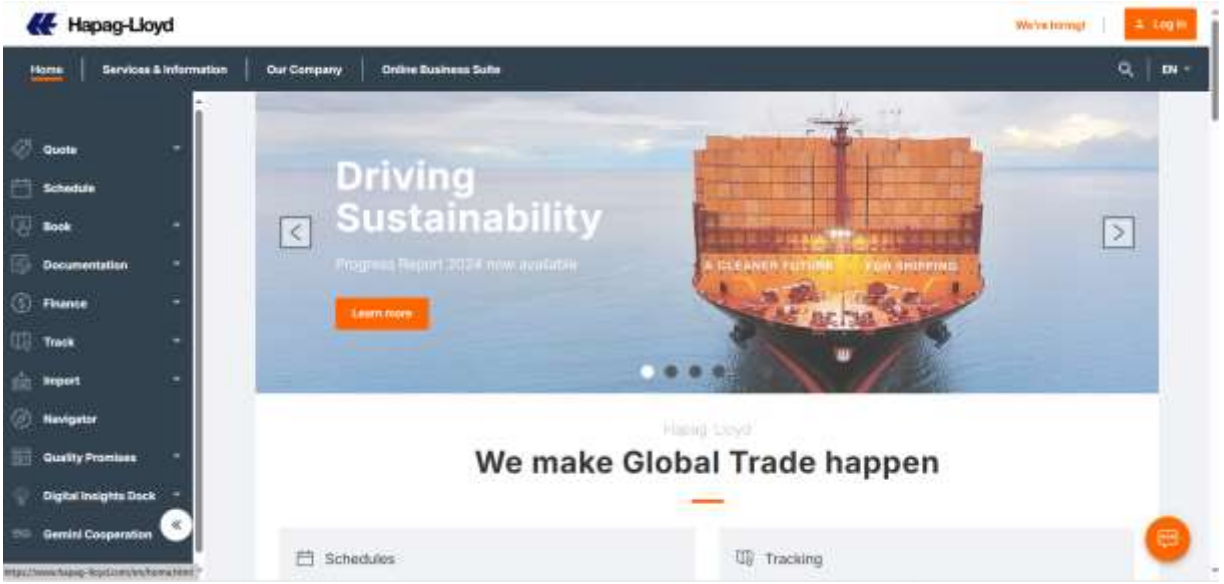

Figure 2.3: atlanticcruisebd.com

2.2.2 Related Research

This part is devoted to providing a broad overview and comparing earlier research in the topic, with a focus on the main points and contributions of specific studies. I concentrate on addressing the gaps in the literature and emphasizing the chances that our present research can take advantage of to produce fresh discoveries and advancements.

TABLE 2.2: COMPARATIVE ANALYSIS WITH PREVIOUS WORK

Sr No.	Criteria	Atlanticcruisebd	hapag-lloyd	Proposed Model (Ship Ticket Booking System)
1.	Target Consumer	All kinds of users	All kinds of users	All kinds of users
2.	Registration	Online registration exists	Online registration exists	Online registration exists
3.	Gallery	No Option	No Option	No Option
4.	Notice Board	No Option	No Option	Exists
5.	Online Payment	Available	Available	Available
6.	Authentication	Strong authentication system	Strong authentication system	Mid-level authentication system
7.	Type	Dynamic	Dynamic	Dynamic

2.3 Gap Analysis

There are several issues with the functionality, design, and operation of current ship platforms, such as Atlantic Cruises and Hapag-Lloyd. In the instance of Atlantic Cruises, it offers services to all customers; nevertheless, it does not have an online notice board for news updates, while having online registration, booking, and alternatives. The efficacy of user engagement is somewhat diminished by this static and limited approach.

The same is true for Hapag-Lloyd, which offers a wide range of services to all users, including online registration, scheduling, booking tracking, customer status, route finding, documentation, and many more. In the current digital era, these elements combine to form a system that satisfies client expectations. They offer reliable solutions for online payment systems or authentication that safeguard user information and handle payments.

In order to improve the user experience, it is imperative that this gap be filled by implementing a dynamic system similar to the suggested ship ticket buying system.

2.4 Summary

Background and gap analysis describe the changing needs of ship booking platforms in Bangladesh. Systems like Atlantic Cruises, Hapag-Lloyd currently exists, although some of these systems are not comprehensive enough to meet the needs of Bangladeshi systems, while others (like Hapag-Lloyd) are capable of meeting the needs of users, as well as lacking dynamic areas such as booking, route find, destination setting, multi-media gallery and a strong authentication system. These platforms are mostly read-only and require features that are essential for the current dynamic user environment and business processes.

The proposed Ship Ticket Booking system aims to fill these shortcomings by introducing some dynamic features such as an improved interface design, online payment gateway and improved communication system, route find, easy seat finding in 2-3 step shop which makes the Ship Ticket Booking system more efficient than the current technological aspirations of users and administrators. Apart from improving the user experience, this effort has also set a standard for future digital transformation in Ship Ticket Booking systems of other organizations.

Chapter 3

Methodology/REQUIREMENT ANALYSIS & DESIGN SPECIFICATION

3.1 Overview

This chapter explains the strategy used to create and put into use a website for a ship ticket booking system. Analysis of user and system requirements, platform architecture design, and feature implementation that satisfies both functional and non-functional needs are its main objectives. Additionally, it incorporates visual aids like diagrams to illustrate user interactions, interface design, and system flow.

3.1.1 System Design

The system is constructed with the Laravel framework, a PHP-based platform that is well-known for its scalability and sturdy architecture, making it the perfect option for creating dependable and effective applications. The design makes sure that the user interface, business logic, and data administration are all well separated. This methodical approach streamlines future adjustments and makes it easier for the system to grow modularly. Both user and administrator interfaces are included in this system:

User Interface:

For users to be able to complete bookings and register themselves as members. Users can input their registration form, read notifications and follow every post made by the admin.

Admin Interface:

The forum, which is intended for all users worldwide, includes both admin and user tools for managing various system operations and member registration. Users who can or cannot register as members for ship bookings, submit registration forms, view ship seats, search for ships by route, find discount and follow all admin-posted updates are the target audience for the user interface. Passengers are constantly informed of all actions thanks

to our user-centric approach. Nonetheless, the admin interface offers administrators a number of crucial functions, including the ability to create new users and administrators, accept or reject users as their information is submitted, and maintain a record of membership applications that have been granted and denied. Email experts allow all users to overlay safety messages that are viewed by everyone who has registered when they join the community. To ensure security, the admin interface is secured using a trustworthy authentication system, limiting system modifications to authorized users only.

Database:

The MySQL database system is used to create databases that store important information and data such as: users' login information, registration information, multimedia content associated with the ship ticket booking function, and information about the booking process required for ship ticket booking. These aspects include features where data management can include changes that can be easily made, an effective user security system, and registration should not be problematic when making online payments. The integrated plan of this design is quite extensive, which includes the artistic defragmentation of the ship ticket booking system to increase capacity and software security, and increased administrative efficiency in its operation.

3.1.2 Functional and non-functional Requirements

Functional and non- functional requirements are further discussed below:

Functional Requirement

- The software must have a login procedure for authorized users, administrators, and sub administrators to prevent unwanted access.
- Sub admins can see, edit, and update with the Super Admin's consent.
- The administrator will be able to update the consignments' current status using the system.
- The system will confirm the data that the client entered when logging in.
- The system will occasionally permit the shift ship.
- The mechanism will enable the discovery of the ship ticket.
- When a ship is active, the user can view it.
- The user will be able to reserve the ticket according to their needs after ten days, when the ship will be activated.

- The system will enable the administrator to show the order's current tracking details.
- The system will enable users to input order details for tracking purposes. The user will be prompted to input consignment information, such as the shipment or reference number.
- View Order will be supported by the system.
- The method will enable the goods to be inspected for damage.
- If the status is damaged, the system will permit a reorder.

Non Functional Requirement

Software performance requirements, software external interface requirements, software design constraints, and software quality attributes are examples of software requirements in software system engineering that outline how the software will accomplish its goals rather than what it will do. Since nonfunctional requirements are hard to test, they are typically assessed subjectively.

The following is a list of some non-functional requirements.

- Performance.
- Usability.
- Employee friendly.
- Maintainability.
- Flexibility.

3.1.3 Context Diagram

The context diagram represents the interactions between the system and its external entities (users and admin). For example:

User: Register, view notices, and access multimedia.

Admin: Manage users, post updates, and oversee activities. Draw a context diagram.

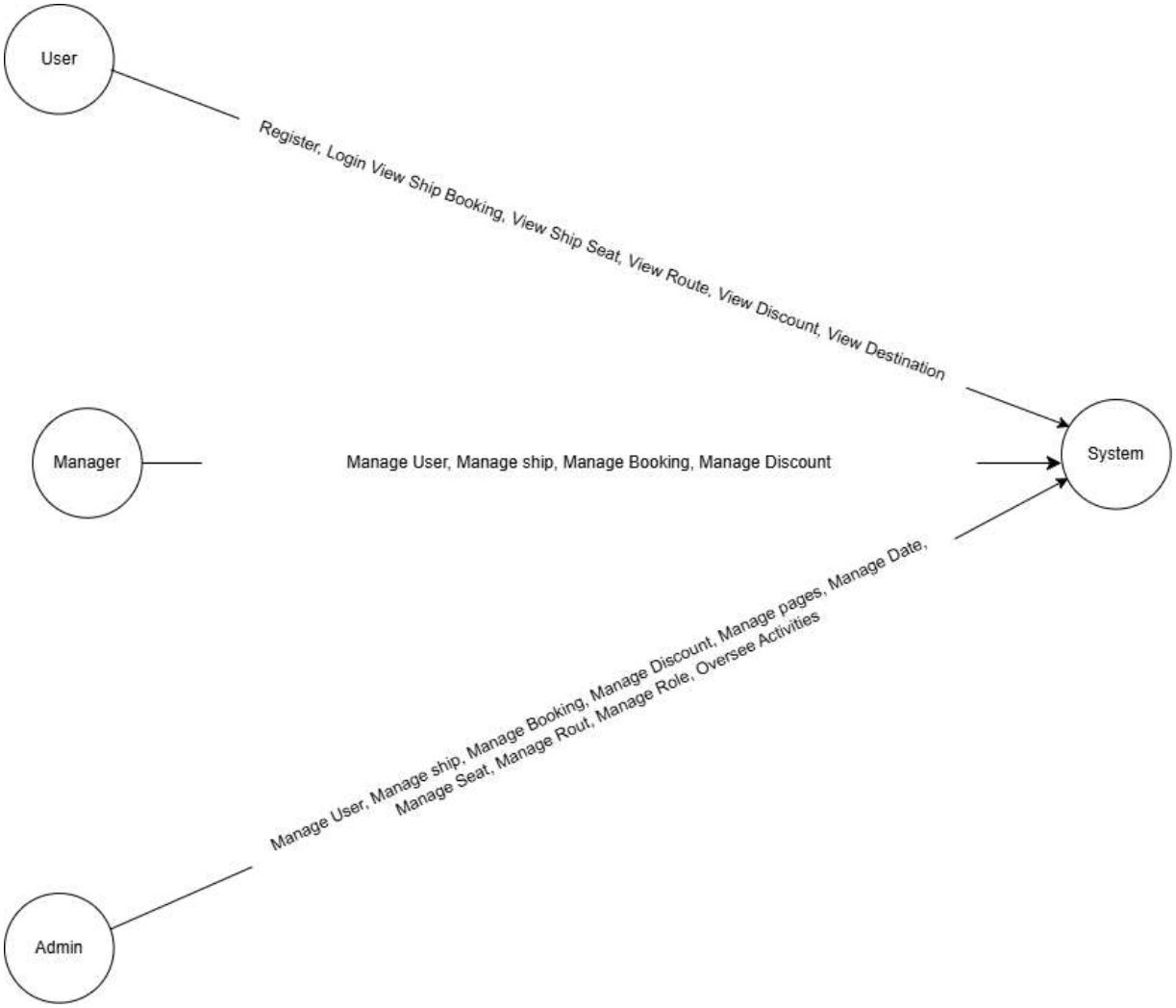

FIGURE 3.1.3: CONTEXT DIAGRAM

3.1.4 Dataflow Diagram

The Data-Flow diagram for the system may include:

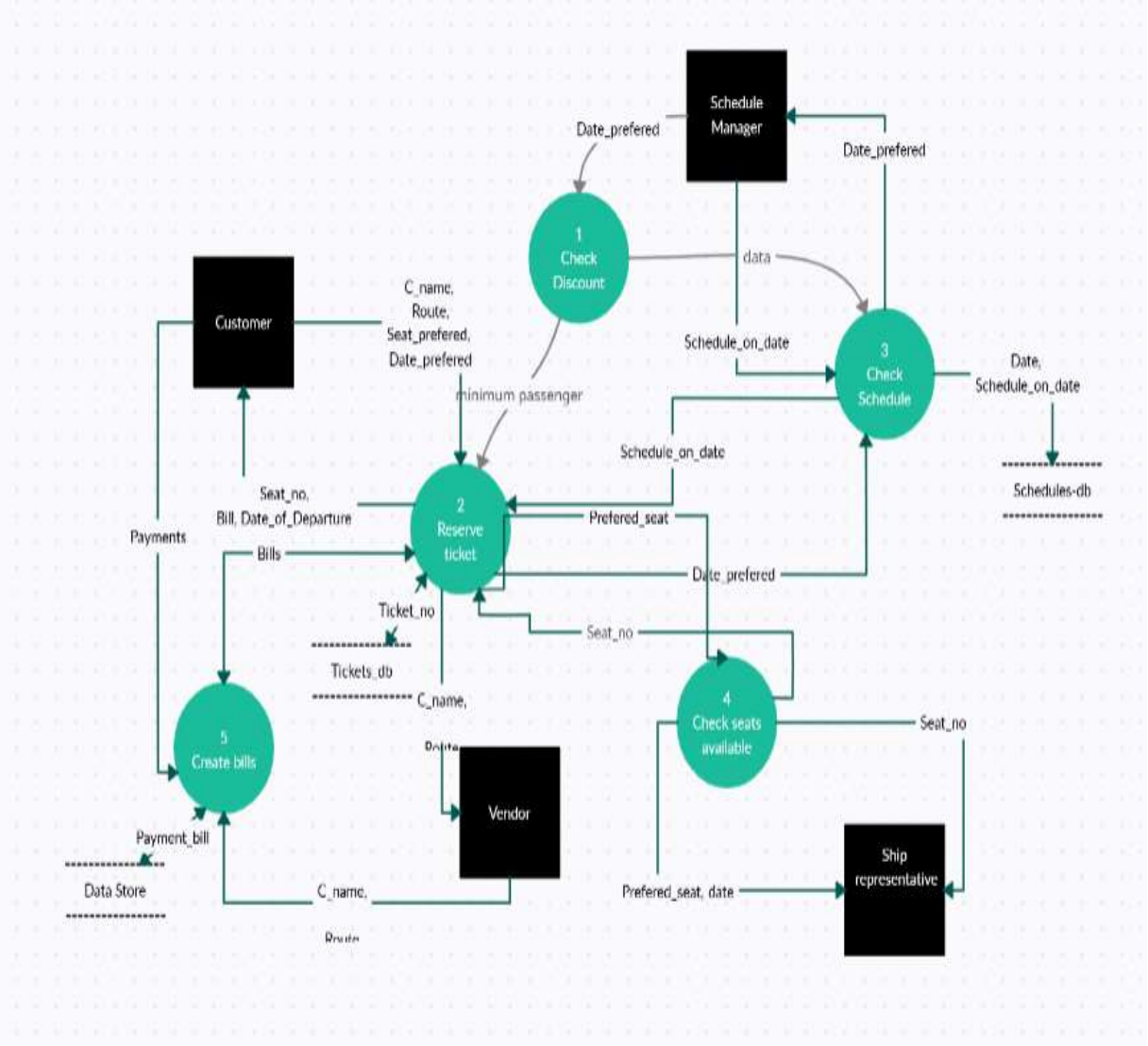

FIGURE 3.1.4: DATA–FLOW DIAGRAM

3.1.5 Use Case Diagram

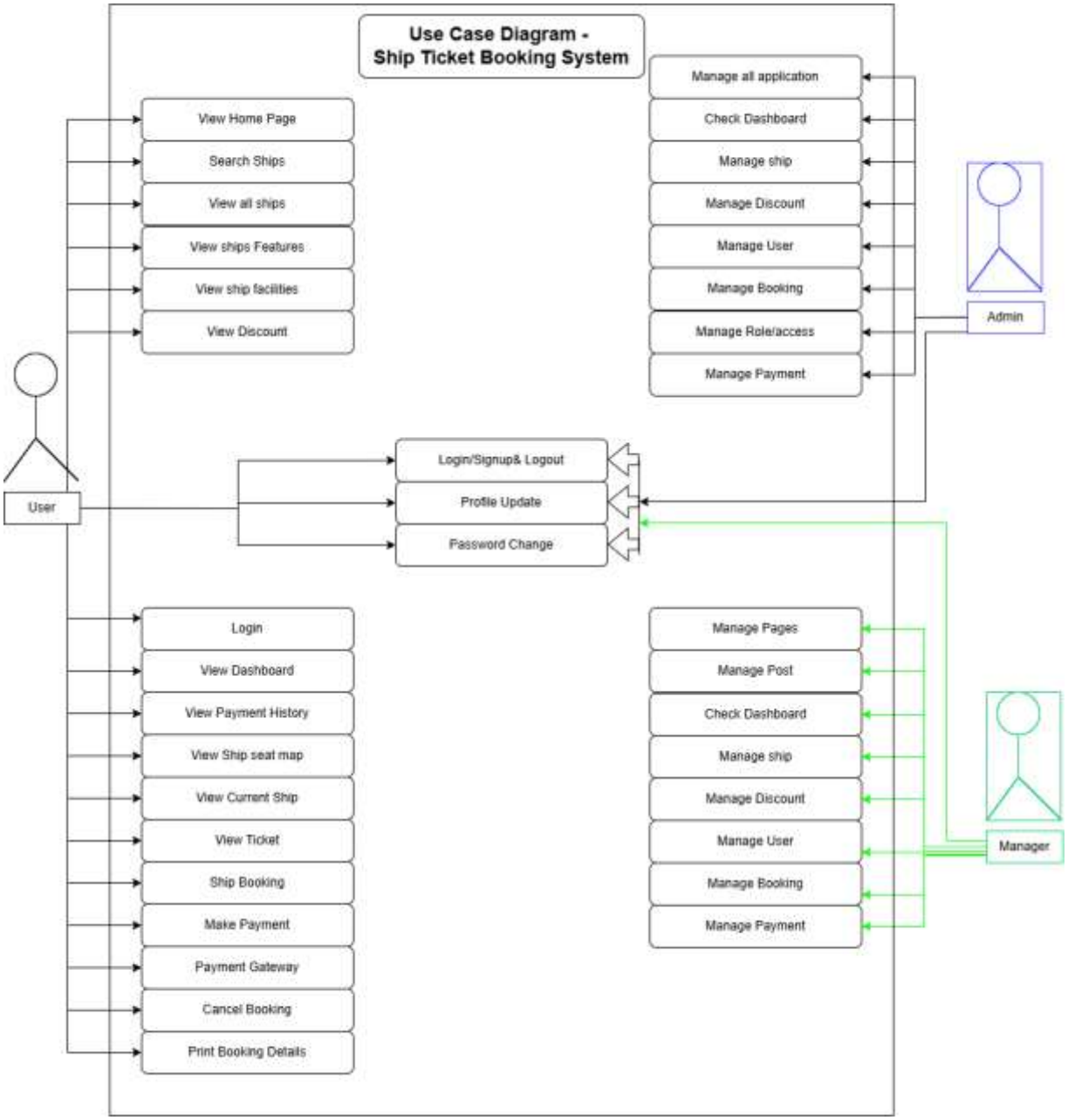

FIGURE 3.1.5: USE-CASE DIAGRAM

3.1.6 ER-Diagram

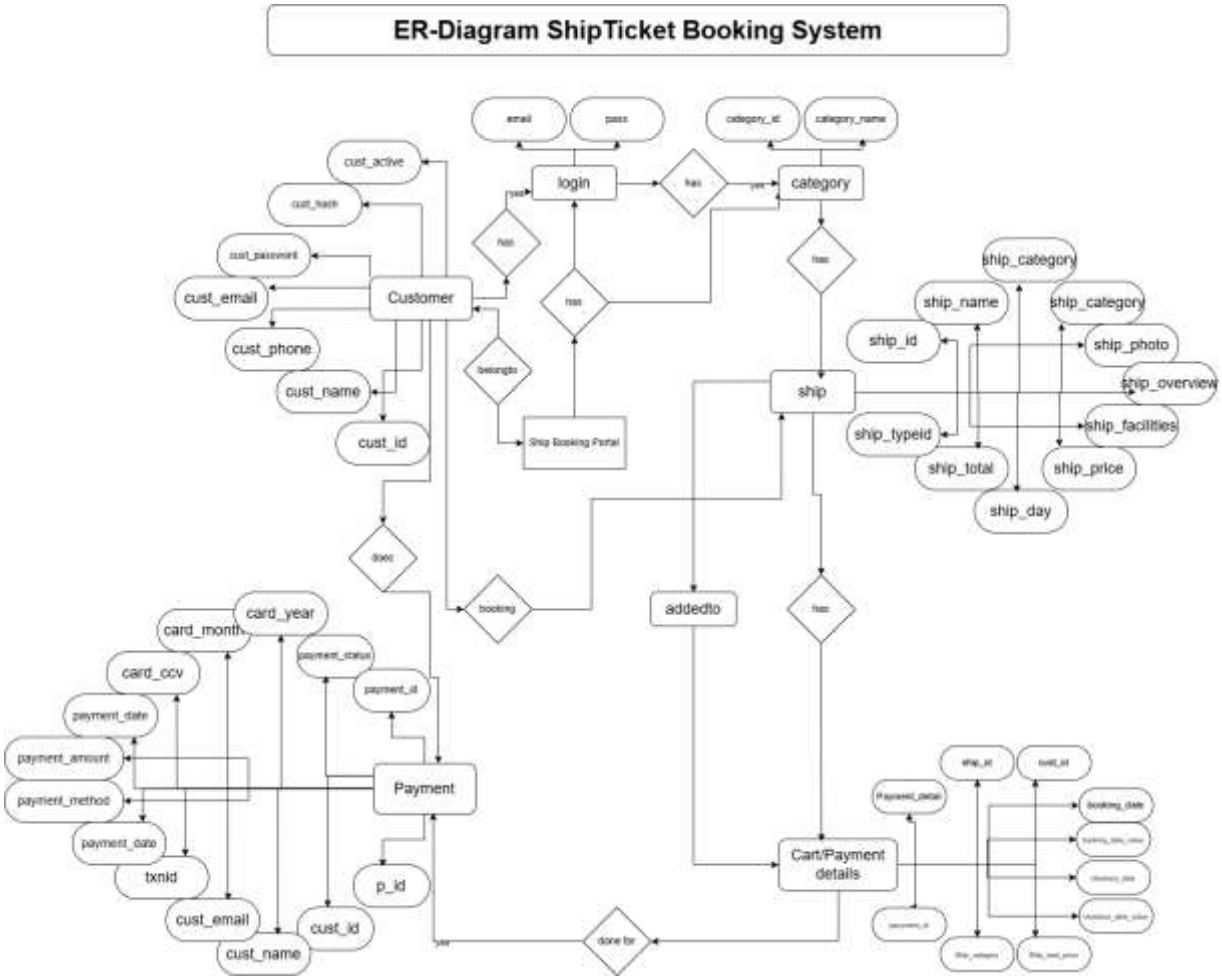

FIGURE 3.1.6: ER-DIAGRAM

3.1.5 UI Design

The user interface is designed to meet the specific needs of both passengers and administrators, ensuring an intuitive and efficient user experience. It is divided into two main components:

Passenger User Dashboard:

This part of the tool is simple and intuitive so as not to create potential difficulties for passengers to use when signing in to the platform.

Administrator Dashboard:

This profile is convenient for the administration and provides the ability to control and monitor all processes on the site. It ensures the availability of a wide range of options for administrators.

Home Page:

On the home page there is some information about our ship ticket booking website.

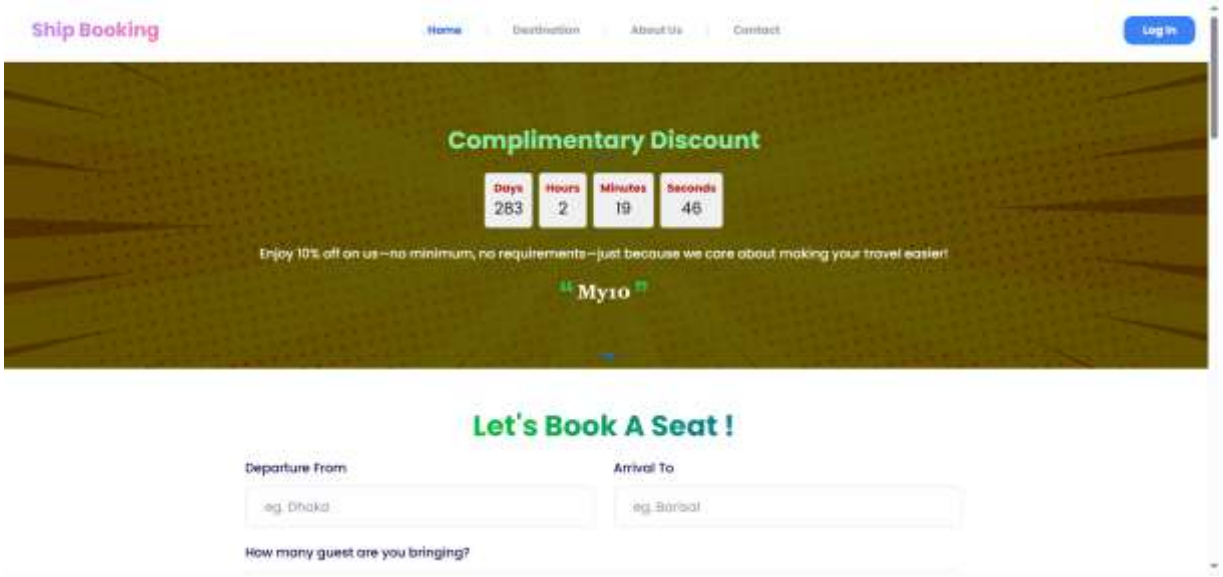

Figure 3.1.5.1: Home Page

Login Page:

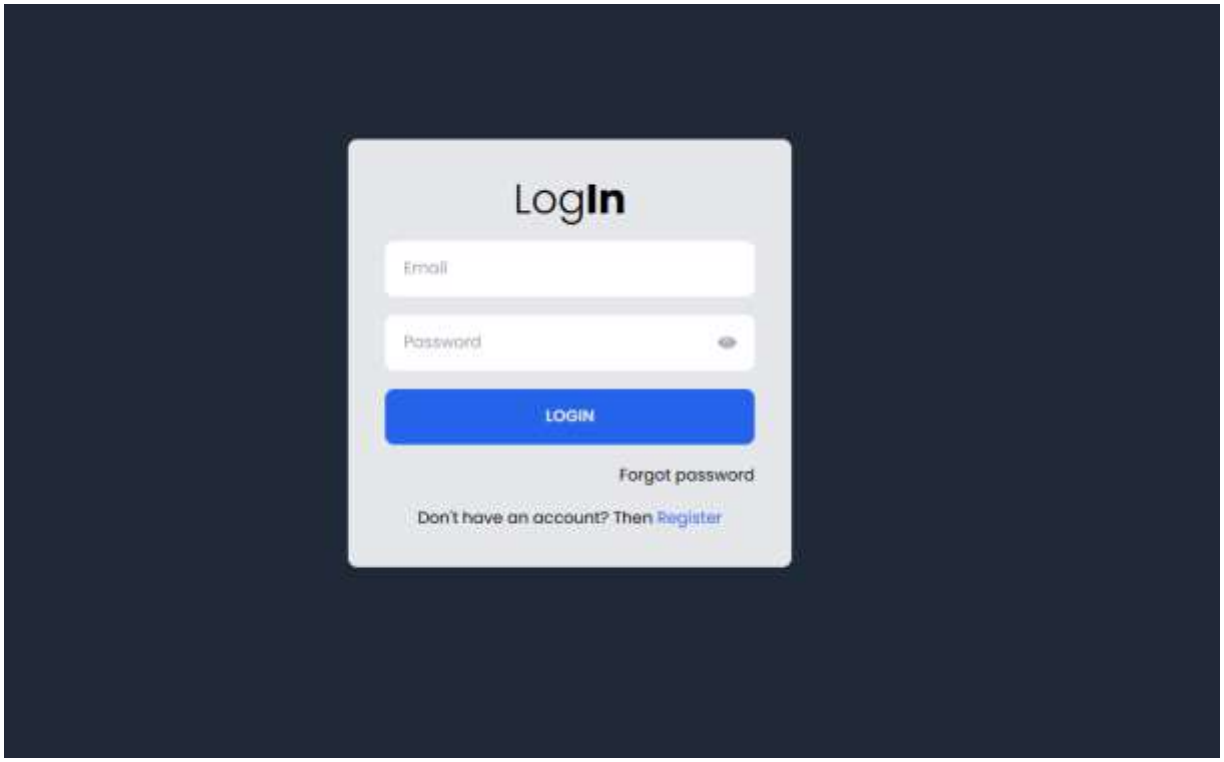

Figure 3.1.5.2: Login Page

Registration Page:

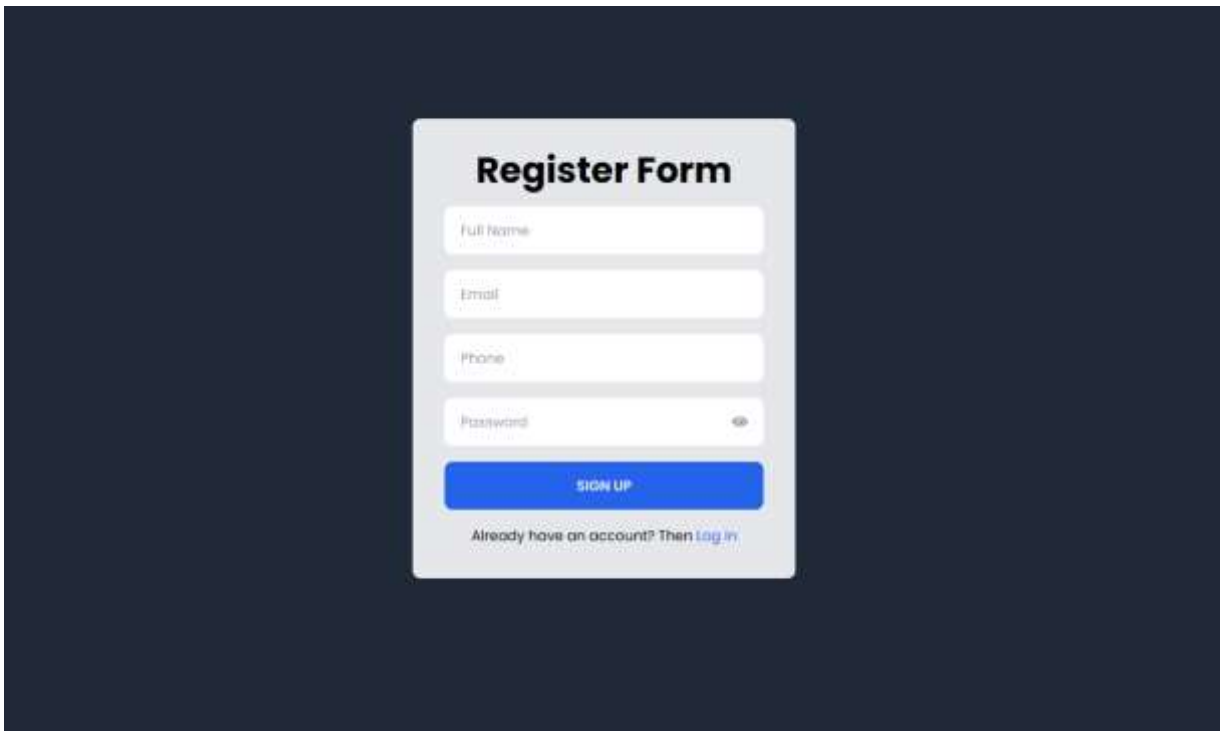

Figure 3.1.5.3: Registration Page

Admin Dashboard:

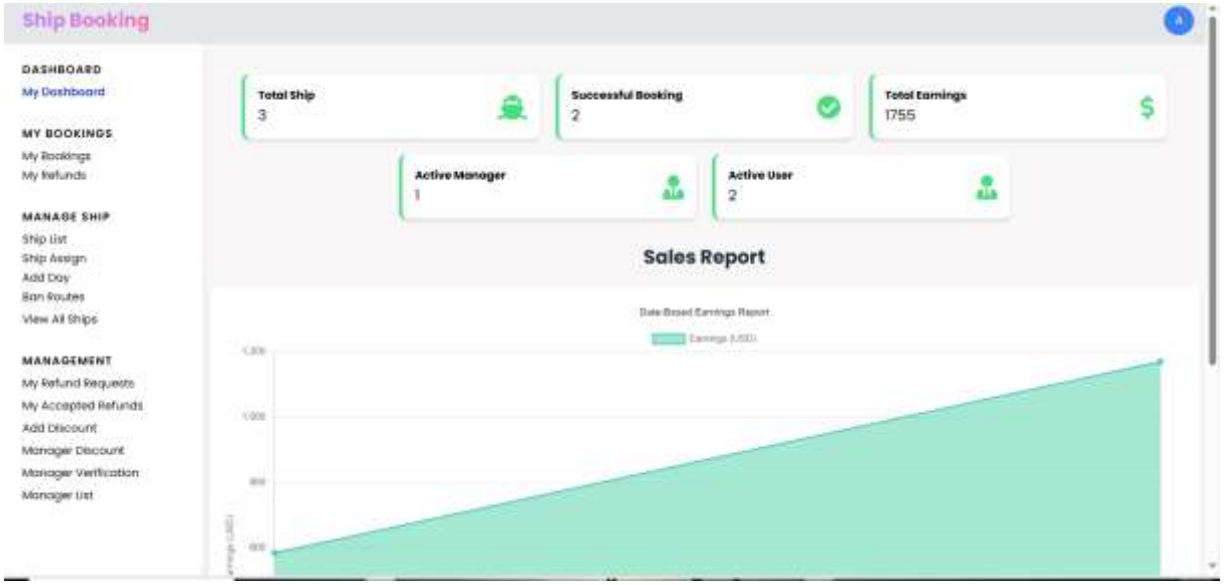

Figure 3.1.5.4: Admin Dashboard Page

Admin Ship Assign:

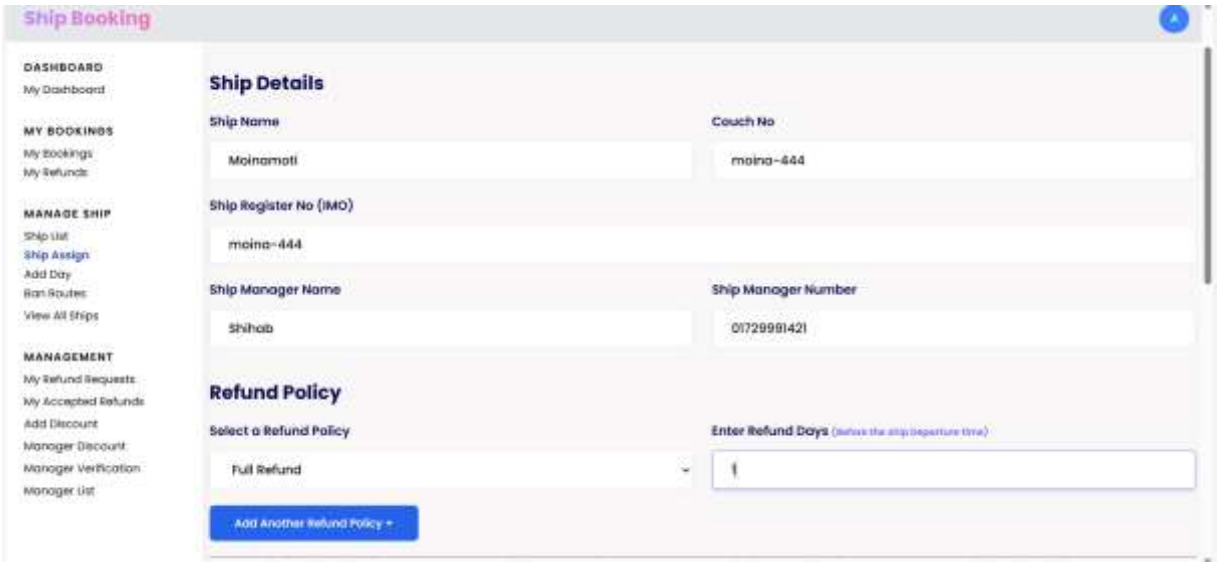

Figure 3.1.5.5: Admin Ship Assign Page

Admin day wise ship Assign :

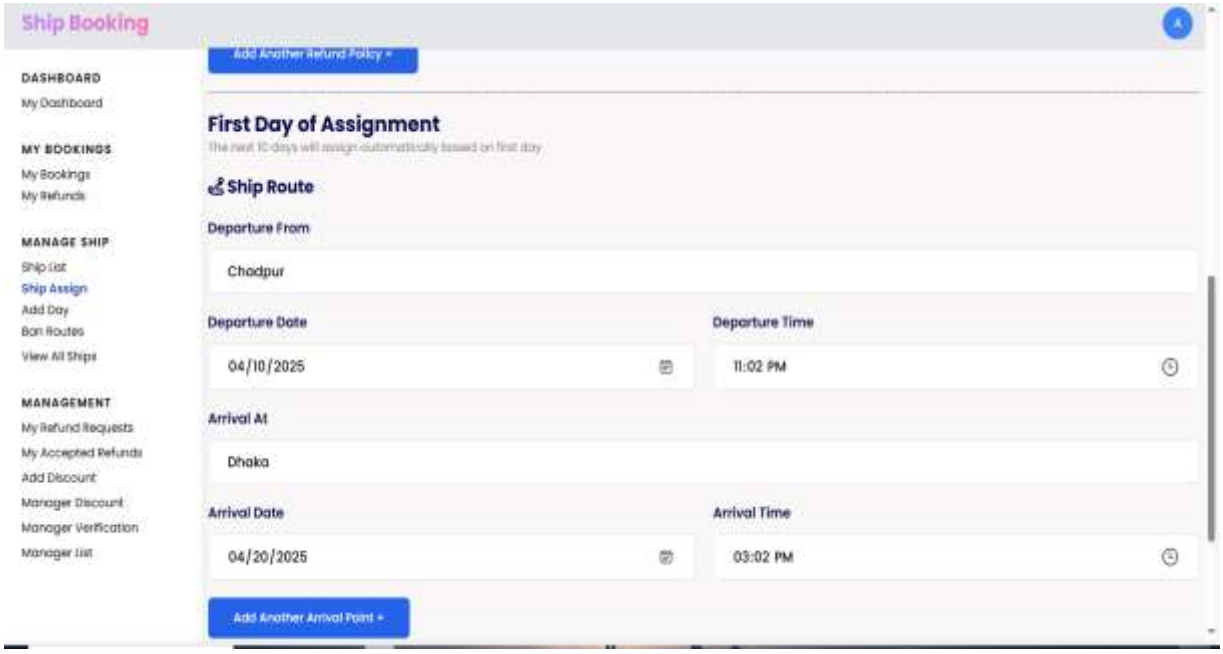

Figure 3.1.5.6: Admin Day Wise Ship Assign Page

Admin Ship Stop Point:

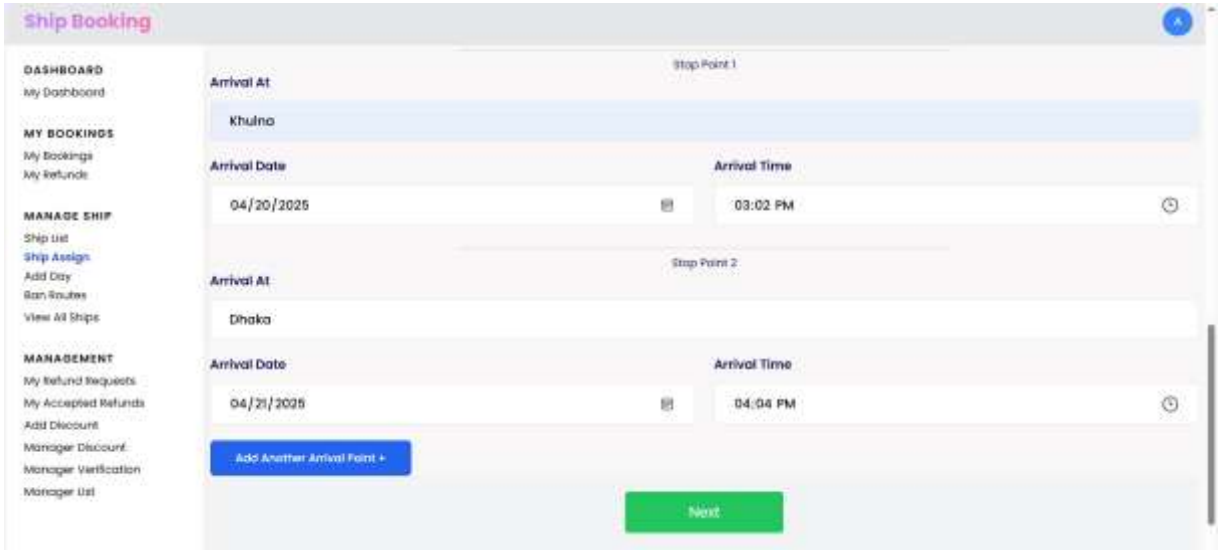

Figure 3.1.5.7: Admin Ship Stop Point Page

Admin Next 10 day Ship Assign:

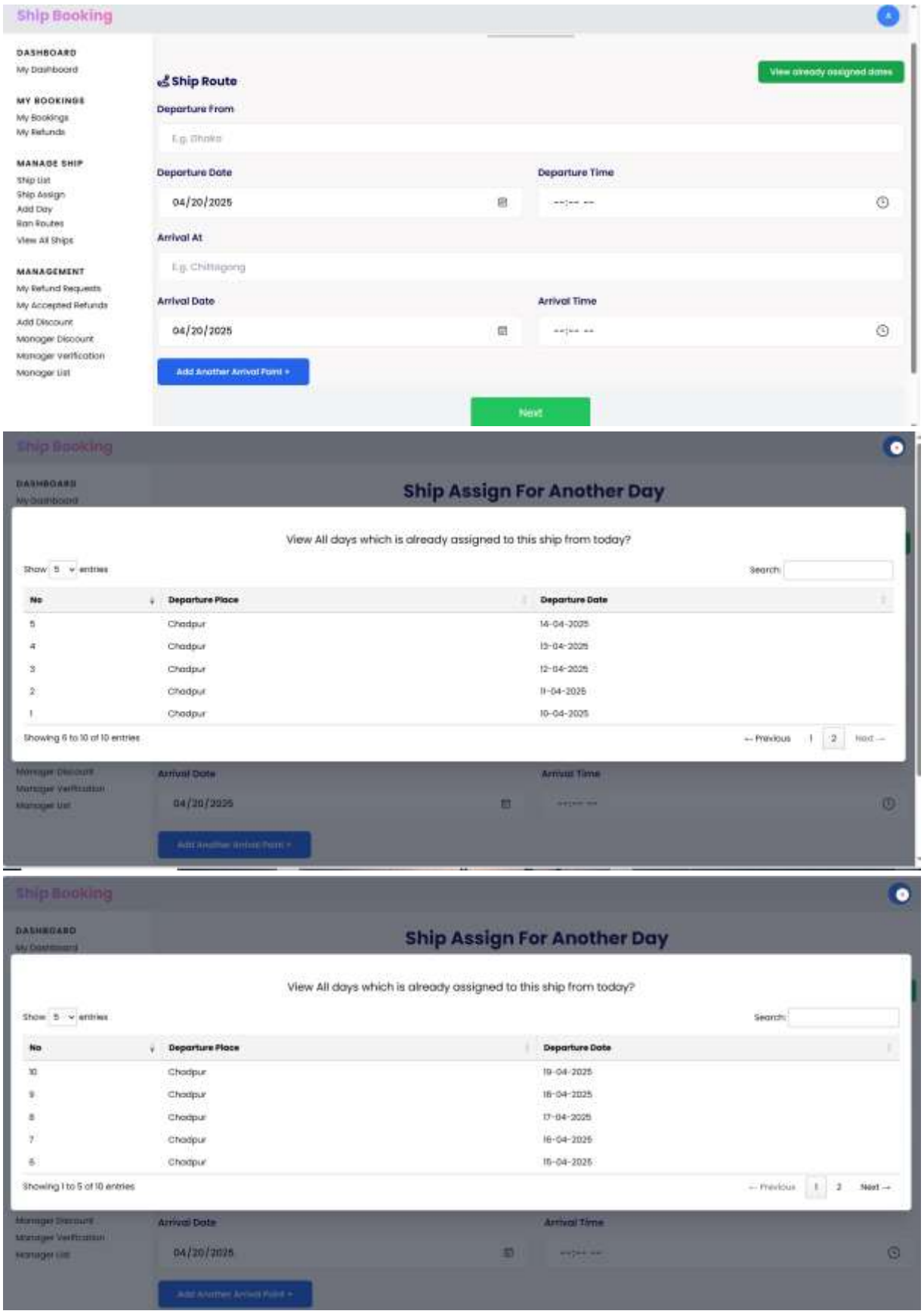

Figure 3.1.5.8: Admin Next 10 Day Ship Assign Page

Admin Ship Seat Map and Price:

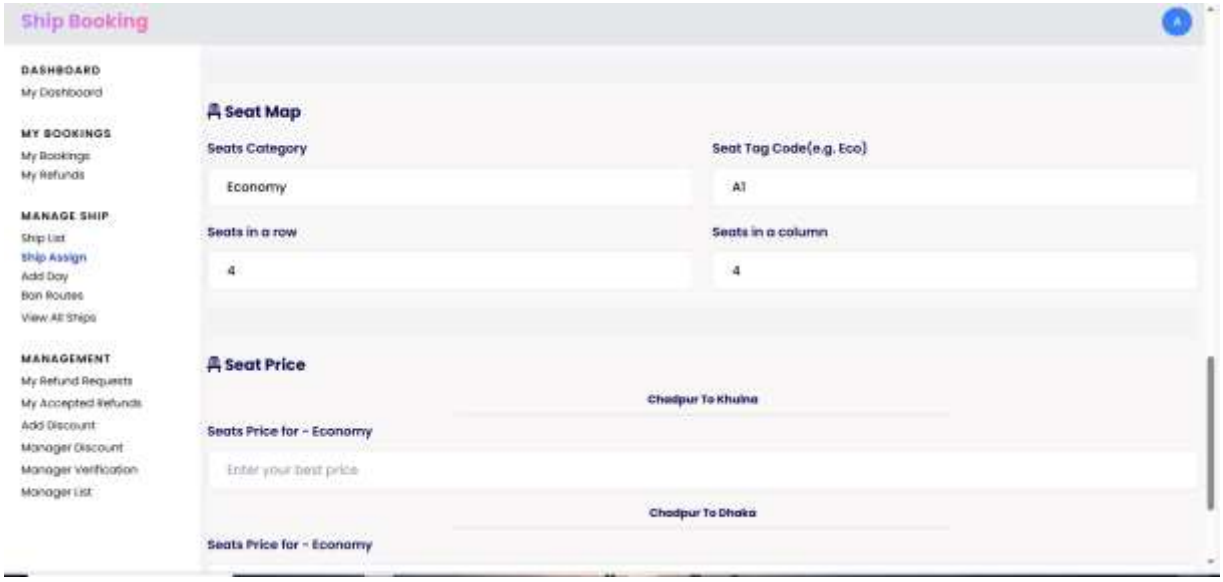

Figure 3.1.5.9: Admin Ship Seat and Price Assign Page

Admin Ship Booking and Ship list:

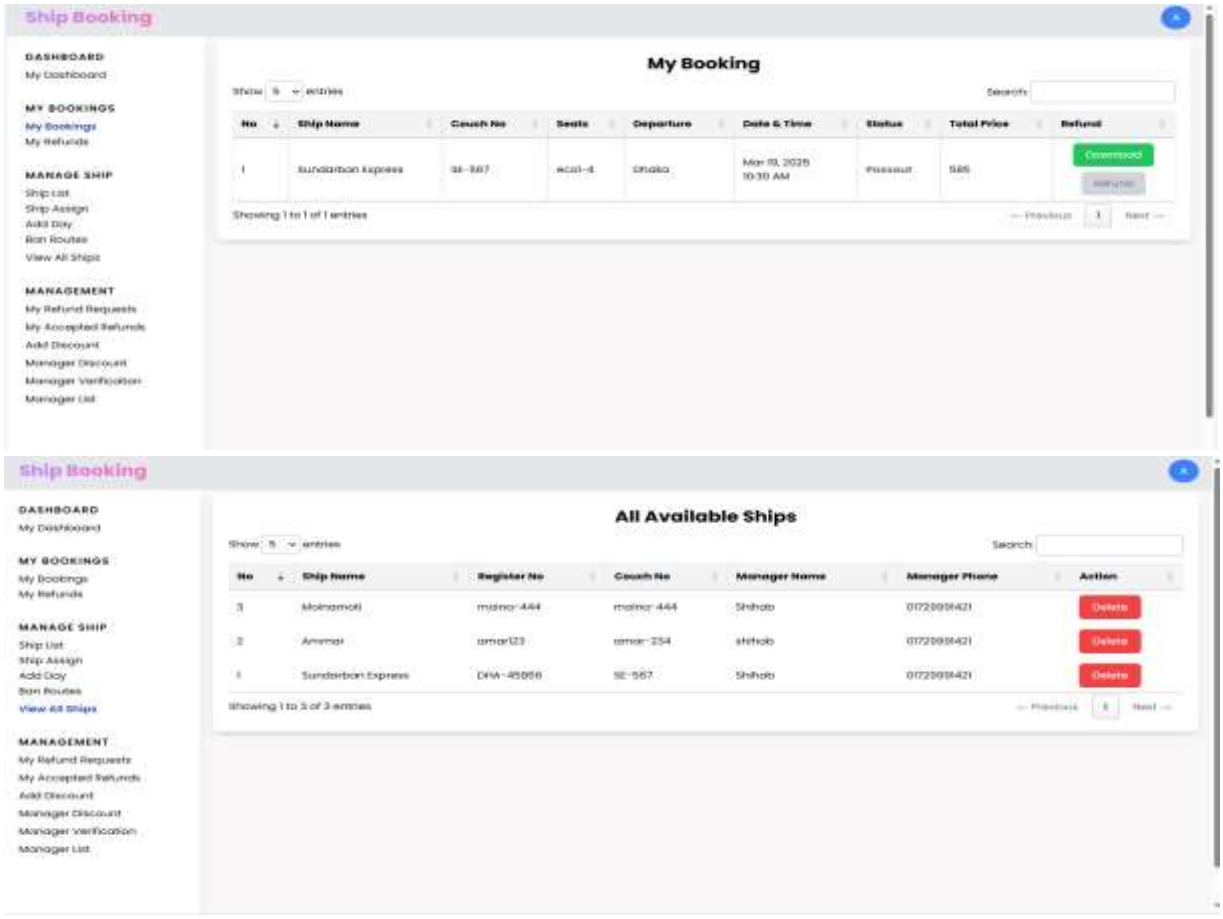

Figure 3.1.5.10: Admin Ship Booking Details and Ship List Page.

Admin Ship Edit:

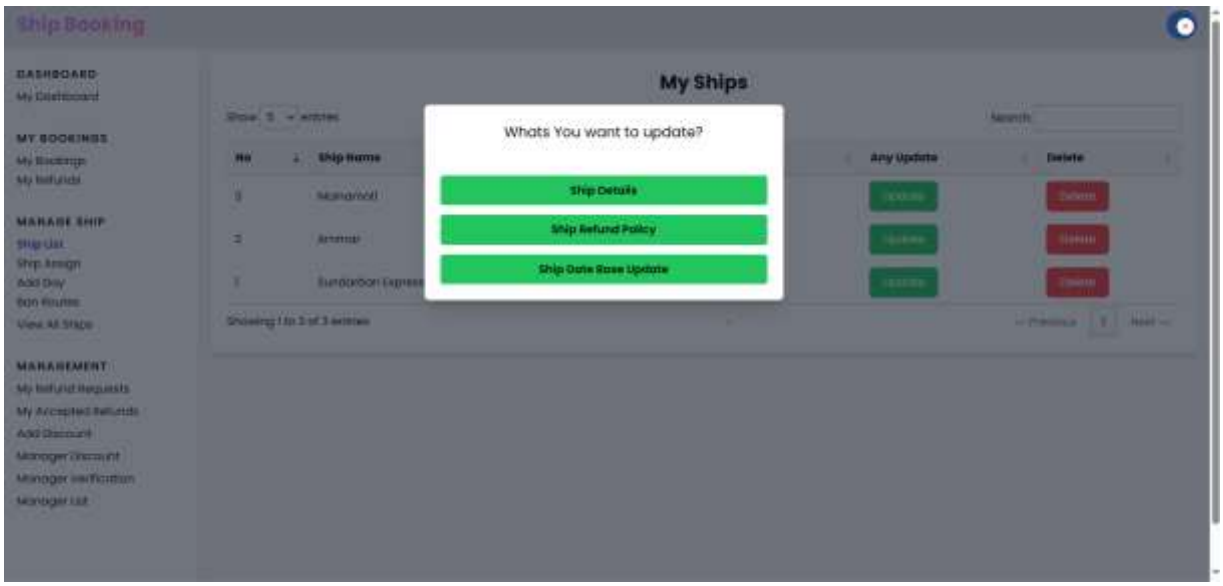

Figure 3.1.5.11: Admin Ship Edit Page

Admin Ship Discount:

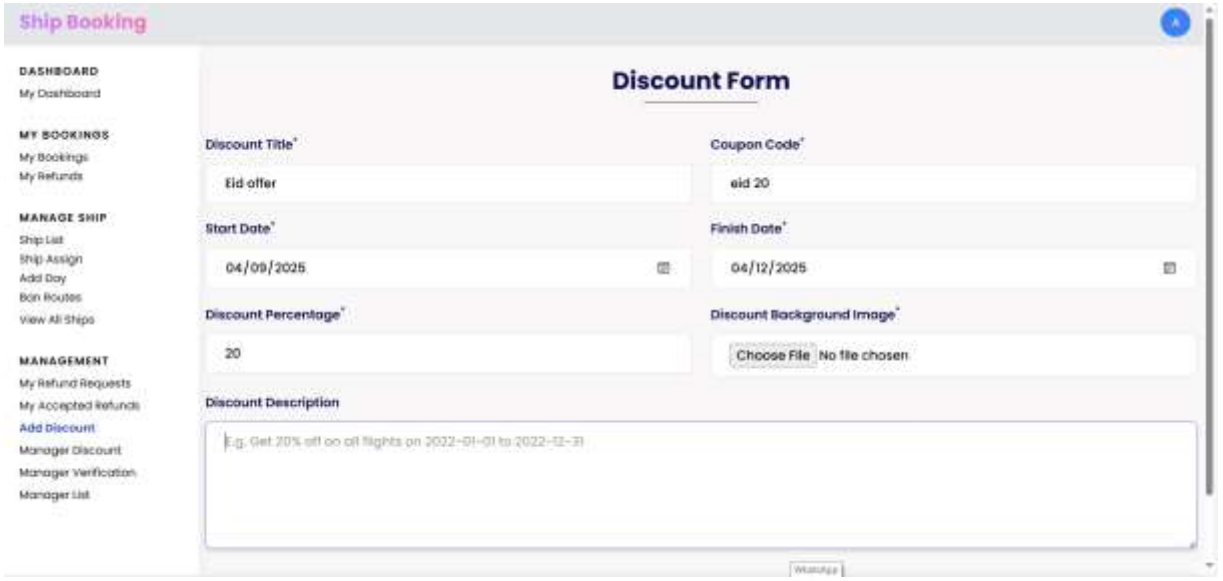

Figure 3.1.5.12: Admin Ship Discount Page

Admin Add Manager:

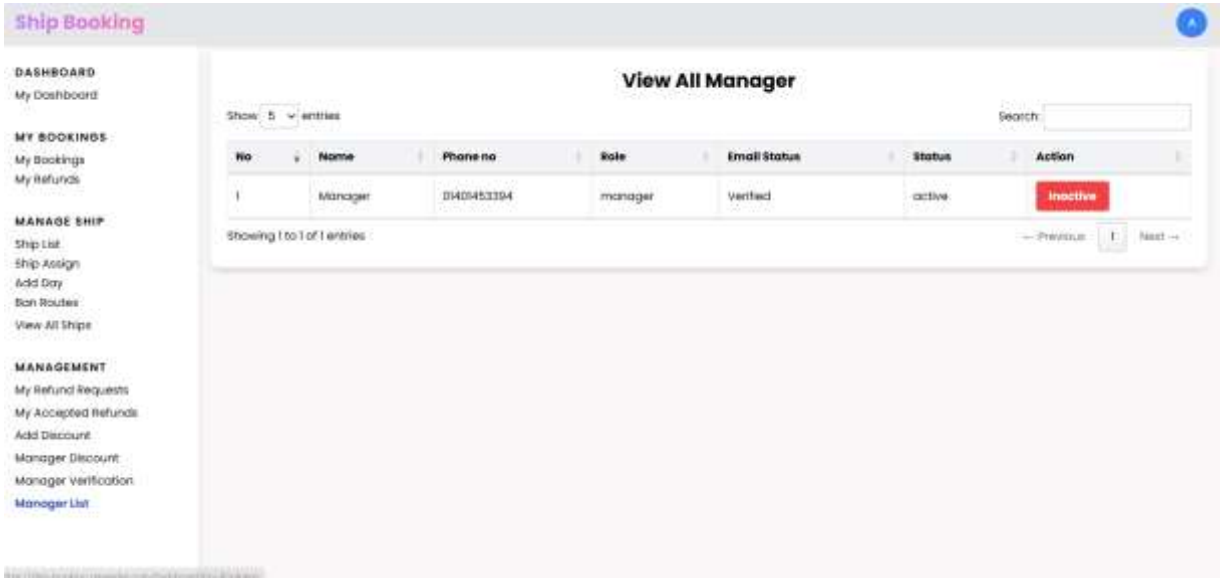

Figure 3.1.5.13: Admin Add Manager Page

Ship Ticket Pdf Download:

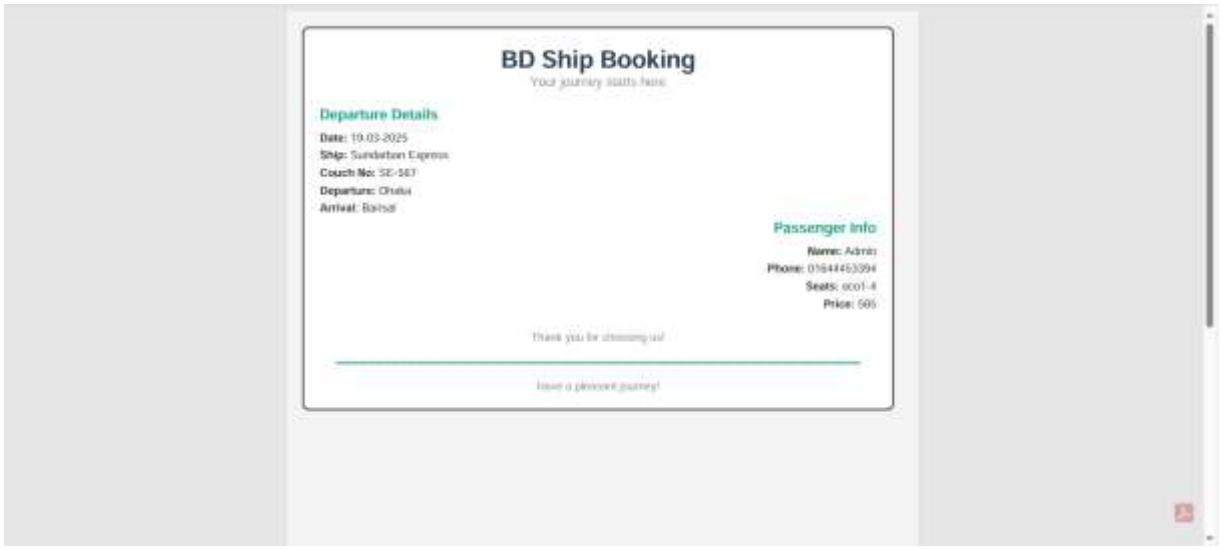

Figure 3.1.5.14: Ship Ticket Download PDF

Manager Dashboard:

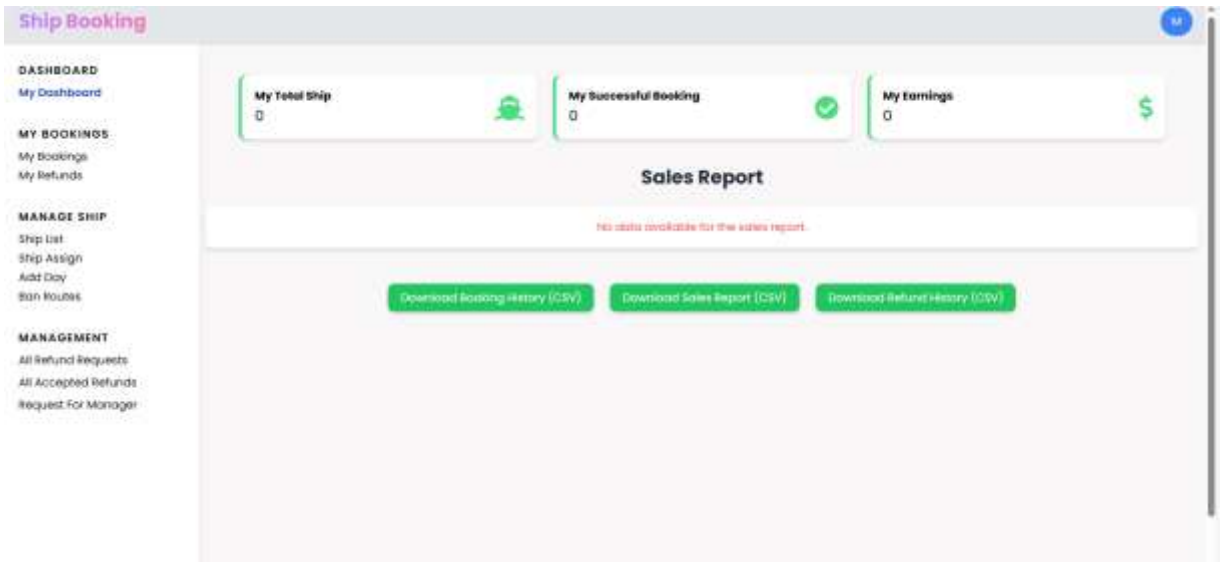

Figure 3.1.5.15: Manager Dashboard

Manager Profile:

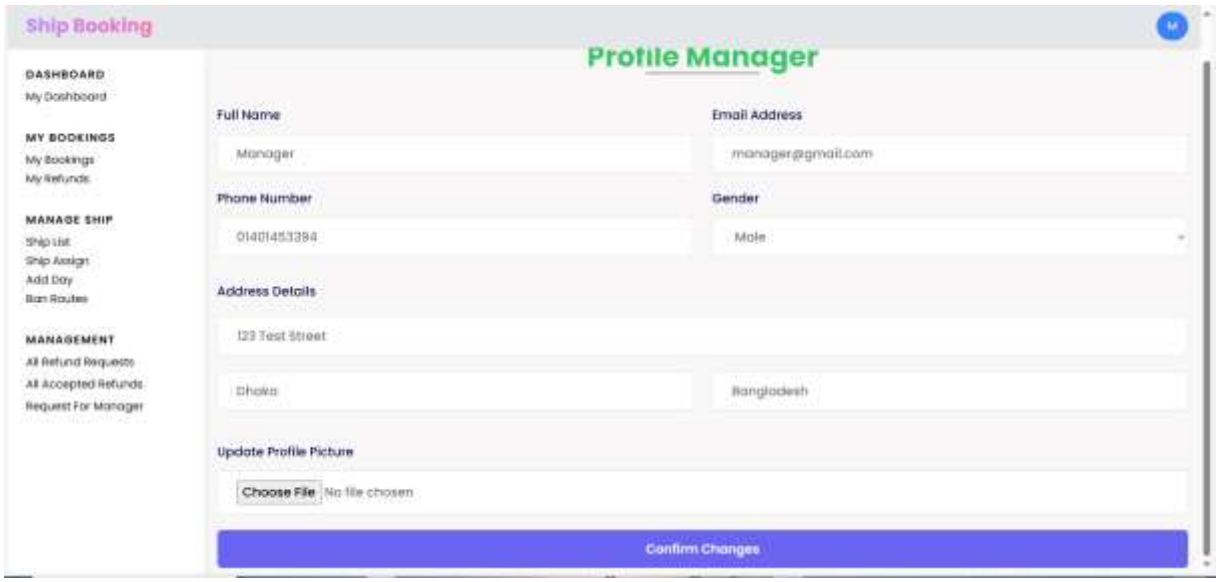

Figure 3.1.5.16: Manager Profile.

Manager Request Page:

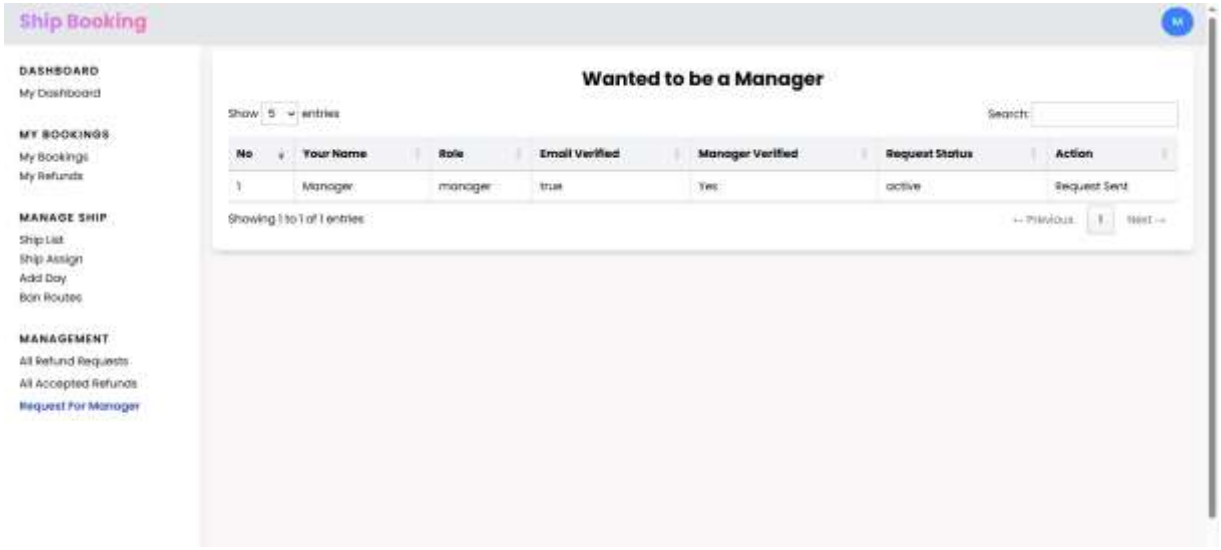

Figure 3.1.5.17: Manager Request Page.

Manager Ship Assign:

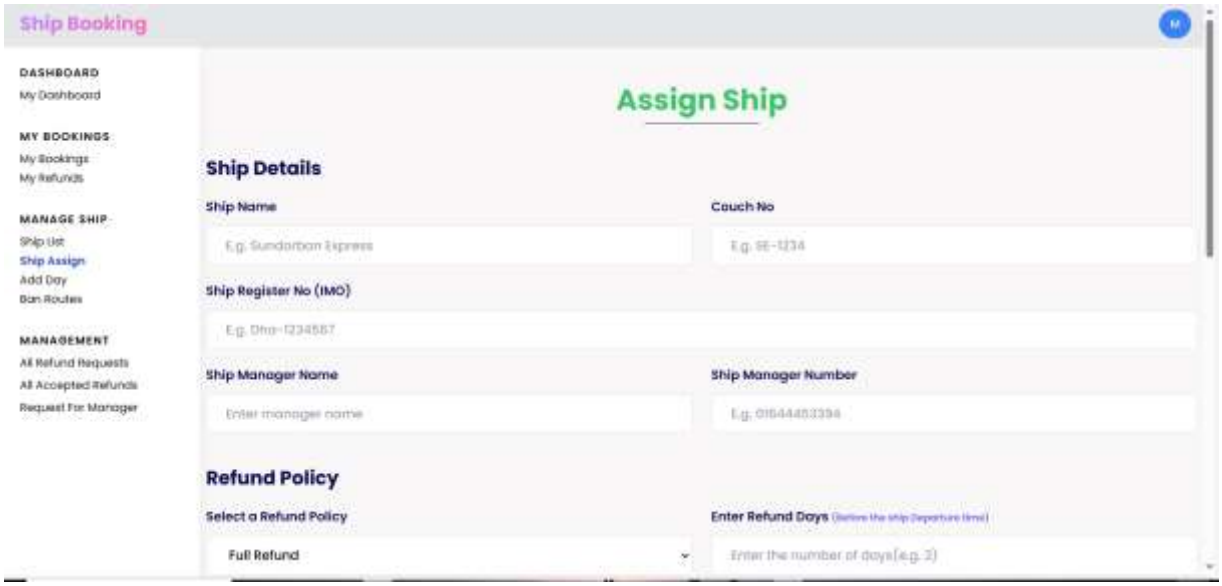

Figure 3.1.5.18: Manager Ship Assign.

Manager Edit all Discount:

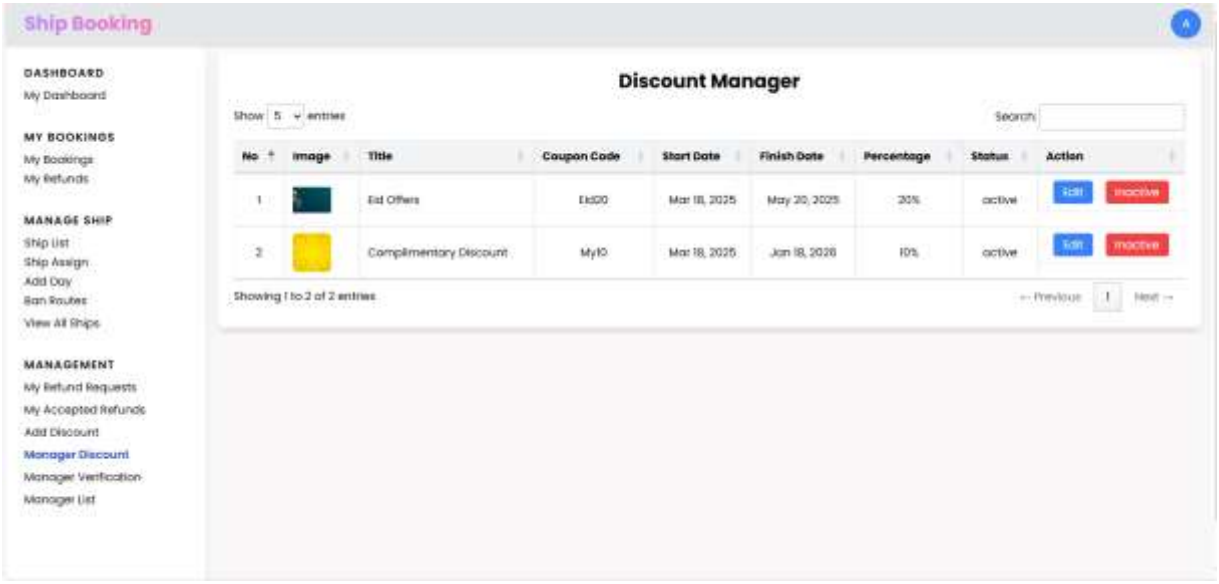

Figure 3.1.5.19: Manager Edit all Discount.

3.2 Detailed Methodology and Design

The Laravel framework, a PHP-based platform for developing web applications, was used in its creation. Because Patterns simplify complex procedures while preserving a strict and well-organized structure, Laravel offers numerous advantages over this architecture of self-contained components. Laravel facilitates the development process and produces scalable and readily maintainable results.

Requirement Analysis:

Since the principle of stakeholder satisfaction is important in the development of this type of system to meet user and administrative expectations, interviews and questionnaires were used. These inputs were used to formulate the project objectives, for example, to facilitate passenger registration, implement a discount system and manage bookings, ship routes. To support the development process, key features and a seven-step workflow were recorded.

System Design:

The Ship Ticket Booking system website's specifications were taken into consideration when designing the Laravel framework. A view of the user interface, a database operation model, and a request handling controller were among the parts of the system. Security architectures like user authentication and other data verification are among the

middleware applications seen in this endeavor. Laravel was used to create the schema through migrations and such features like cascading, relations and sub relations between tables was implemented.

Frontend Implementation:

The Laravel Blade template, which enables more dynamic content and templates that can be reused, is used to build the website's frontend. JavaScript was used to implement features like form validation and updates, while HTML and CSS were utilized for the interface's layout and design, respectively. The user interface has been designed with ease of use in mind, making it simple to use for both administrators and passengers.

Backend Implementation:

Laravel routing was utilized on the backend to direct user requests to designated controllers. They took care of routine tasks like user management, booking, publishing, discounting, passenger registration, and route finding. All data inputs were checked to make sure they matched the database's needed values using Laravel's validation features. Managing several databases and associated queries for user control was made simple by Laravel's Eloquent ORM architecture.

Testing and Maintenance:

This allowed for the provision of a thorough test of additional system features in order to gain a better understanding of its operation. The framework's built-in testing tools were utilized for unit and feature testing, and some administrators and passengers provided trial feedback for user acceptability testing. This allowed the system to adapt to shifting demands by establishing an acceptable update schedule and test scope.

It was feasible to develop a Ship Ticket Booking system website that offers administrators and passengers easy-to-use, safe, and efficient tools with the aid of Laravel's robust capabilities. More significantly, this approach is more long-term flexible due to its increased durability and structural strength.

3.3 Project Plan

The project is divided into several stages to guarantee a methodical and timely development process. These phases are listed below:

Step 1: Gathering requirements and designing the prototype are finished.
Step 2: Registration forms and the continuous operation of digital boards are additional front-end capabilities.
Step 3: Various dynamic implementations and database links.
Step 4: They consist of extensive debugging and testing.
Step 5: Execution and stakeholder input for the finishing touch.

Estimated timeline for completion:
Frontend integration: December 2024
Backend integration: December 2024
System testing: January 2025
Final deployment: March 2025

3.4 Task Allocation

TABLE 3.4: TASK ALLOCATION OF THIS PROJECT

Task	Deadline
Prototype Design	December 2024
Front-End Development	December 2024
Backend Development	December 2024
Database Setup and Integration	December 2024
Testing and Debugging	January 2025
Final Deployment and Feedback	March 2025

3.4 Summary

The project requires a proper approach to build a Ship Ticket Booking website that meets the needs of the users and all stakeholders, which is built based on the prescribed methodology. That is, using today's advanced technologies like Laravel, PHP, MySQL, etc. The registration of ship booking, seat booking, ship discount, route found sections of the site are built so that there are no inconsistent interfaces. Successful coordination of work, distribution of work and round-robin feedback ensure that the project moves towards a functional final output.

Chapter 4

IMPLEMENTATION

4.1 Environment Setup

The development and deployment of the Ship Ticket Booking website required a robust and well-configured environment to ensure optimal performance and compatibility. The setup details are given below:

Development Environment:

- **Operating System**: Windows 10
- **IDE/Editor:** Visual Studio Code with extensions for PHP, Laravel, and MySQL.
- **Framework:** Laravel (PHP-based) version 9.x.
- **Languages Used:** PHP, HTML, CSS
- **Database:** MySQL version 8.x for efficient data storage and retrieval.

Server Configuration:

- **Web Server:** Apache2 with PHP 8.x enabled.
- **Database Server:** MySQL installed on localhost during development, later migrated to a cloud-based server for deployment.
- **Tools:** Composer for dependency management, Node.js for frontend asset compilation using Laravel Mix.

Version Control:

Version control was handled by Git, and frequent commits were sent to a private GitHub repository for backup and collaboration.

Deployment Environment:

- Hosted on a shared hosting platform with Laravel support.
- HTTPS enabled for secure communication.
- Server settings optimized for Laravel applications for cache management and database migrations.

4.2 Testing and Evaluation

A thorough testing strategy was used to guarantee the system's resilience and dependability, including the following kinds of testing:

- **Unit Testing:** Laravel PHP-Unit was used to test each module individually, such as user registration and notification posting.

- **Integration Testing:** Verified form submission and the communication between the frontend and backend, including managing database updates.

- **Functional Testing:** Verified that the system met all functional requirements, such as error messages, data validation, and user login/registration.

- **Usability Testing:** Conducted in a group setting with a select group of administrators and passengers to assess how simple it is to navigate the website and discover information.

- **Performance Testing:** Using technologies like Apache JMeter, we verified that the website operated well under various loads.

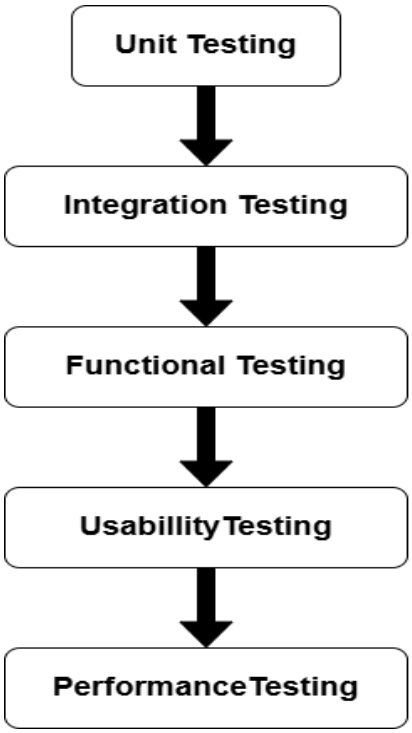

FIGURE 4.2: SYSTEM TESTING

4.3 Result and Discussion

It can therefore be said that the establishment and deployment of the Ship Ticket Booking website has progressed towards meeting the initial goals set out in the first phase of the requirements analysis. A robust and powerful platform was designed to meet the needs of the Ship Ticket Booking program user group, especially ship travelers, administrators and other stakeholders associated with the program.

In order for travelers to be enlisted as ship ticket booking passengers of the organization, the user registration module was implemented satisfactorily. As a result, a stringent validation process has been added, which establishes the benchmark for providing the system with validation techniques to recognize data integrity and accuracy for improved customer satisfaction. Administrators can post update notifications on their dashboard with efficiency thanks to the detailed ship seat design, corresponding ship booking, and discount management. This guarantees that ship passengers are informed of any updates regarding discounts based on their individual profiles. Administrators can also oversee membership evaluations using the membership management system. In addition to having a well-structured database of authorized and pending passengers for organizational control and responsibility, administrators have the authority to accept or reject these applications based on specific information provided.

Discussion:

The system's elegant design and ease of use were cited by stakeholders, and few changes were suggested for other improvements, like category-based notice filtering. It is also possible to specify which components should be addenda to a larger system, including extras like activity monitoring or linking with other systems.

4.4 Summary

The Ship Ticket Booking website's environment, testing procedures, performance evaluation standards, and outcomes are all covered in this chapter. Meeting both functional and non-functional requirements was made achievable by the systematic system testing procedure. Notwithstanding a few small issues, the project's objectives were met, and it gave the administrators and passengers of Ship Ticket Booking a practical and manageable foundation. Expanding the options and improving the interface may be relevant to future development.

Chapter 5

ENGINEERING STANDARDS AND DESIGN CHALLENGES

5.1 Compliance with Standards

To improve dependability, security, and scalability, the Ship Ticket Booking website is coded in compliance with industry standards, just like any other online application. The program is designed with a great deal of care, making it simple to maintain and modify in the future. Hardware standards guarantee the best possible performance in terms of shared server topologies and traffic capacity. Improved usage of encryption mechanisms keeps users and the platform communicating securely and minimizes user data leaks. These actions create a strong and adaptable building system that reflects both present and future requirements.

5.1.1 Software Standards

The Ship Ticket Booking website application was created in accordance with widely recognized software engineering best practices. Because of its strong structure and ability to provide safe and simple scaling of MVC applications in accordance with the ISO/IEC 25010 paradigm, the PHP framework Laravel has been used. It is compatible with well recognized web development approaches due to the PHP and MySQL concepts. Additionally, working with clean and modular code is made possible by the Laravel framework's use of the MVC architecture. Furthermore, these guidelines will come in handy later on when the website is expanded to include new features like chat rooms and forums.

5.1.2 Hardware Standards

The Ship Ticket Booking website is designed to operate on a standard server configuration that complies with ANSI/ISO/EIA standards for data processing. The website's backend specifications for the website to function effectively are that the system should have at least 8 GB of RAM and 256 GB of SSD. These specifications ensure that the system can handle large traffic for user registration and posting notifications.

5.1.3 Communication Standards

The usage of HTTPS in communication is ensured by this website to guarantee secure connection between the user's browser and the server. It guarantees that all user passwords and any private information entered on the device will be safeguarded by TLS encryption. Furthermore, OAuth2 is correctly implemented for authentication and verifies the identity of the user if the web application satisfies the necessary security requirements. Future social media platform integration will also adhere to security protocols connected to APIs in order to create safe, smooth communication.

5.2 Impact on Society, Environment and Sustainability

This registration, declaration, and resource access, which formerly took a great deal of time, have been made quick and simple with the new Ship Ticket Booking website. It decreases the environmental effect of documents, safeguards user data security and privacy, and promotes collaboration by granting equal access to information. This is significant not only because it makes the platform viable in the long run, but also because it makes the process of booking ship tickets more structured, ethical, and ecologically friendly.

5.2.1 Impact on Life

It gives users or administrators a one-stop shop where they can access vital resources, make announcements and distribute pertinent information, and register passengers for the Ship Ticket Booking program. Time is saved, organization is enhanced, and less human labor is required as a result, all of which boost the effectiveness of ticket booking operations. It piques users' interest and makes everything simple and advantageous for their extracurricular and academic pursuits.

5.2.2 Impact on Society & Environment

This section demonstrates how digitizing ship operations lessens the hassle of paper-based procedures, which leads to less waste and less environmental protection. Additionally, it guarantees equitable access to information for all of its clients, irrespective of their geographic location. The community is well-known since one of the system's primary advantages is that it links stakeholders and removes obstacles to communication.

5.2.3 Ethical Aspects

This platform was developed with a focus on ethical issues, including privacy and data security. In the event of a breach, users' preferences and personal data are safely kept and encrypted to GDPR compliance standards. To help consumers understand how their information is being used, the ethical norms of accountability and transparency were upheld in its use.

5.2.4 Sustainability Plan

The intention was to make the system easily maintainable and scalable throughout time. This is done to make sure the software program is protected from hackers worldwide who are always looking for methods to take advantage of software flaws and is updated with new features. When the website's architecture is modular and cutting-edge technologies like Laravel are employed, this is once more feasible and eliminates the need to redesign the majority of the website in the future.

5.3 Project Management and Financial Analysis

5.3.1 Sustainability Plan

The Ship Ticket Booking website was developed using a project management technique that produced a methodical, effective product that complied with all the requirements. The following lists the main components of the project management process:

- **Planning and Initiation:**

  Goal Setting: The primary objective was to establish an environment that was easy to scale, safe, and convenient for administrators and passengers alike.

  Requirement Gathering: An understanding of functional and technical elements was obtained from the competition analysis and context evaluation conducted during the initial interviews.

- **Task Allocation and Timeline:**

  The project tasks were broken down into extremely detailed phases, which helped to streamline the workflow and made the assignment's goal very evident. Deadlines for completing particular tasks within the project duration were assigned to each stage of the live advertising platform

development process. With this strategy, the website was upgraded gradually and every component was finished, with the exception of improvements that might be added later in response to user input.

- **Resource Management:**

  Hardware Requirements: 8 GB of RAM and 256 GB SSD minimum configurations were comfortable for development and testing.

  Software Tools: Organization and practicality of coding frameworks, databases, and debugging tools to the working procedure.

  Team Coordination: Roles were assigned and interdependence was promoted so that every person in a team is held responsible for their duties.

- **Risk Identification and Mitigation:**

  It also demonstrates that possible difficulties like ambiguous, lacking, or insufficient specifications, technical problems with integration, and time restrictions were taken into account right away. Using techniques like teamwork, iterative feedback collecting, and timeline adaptation, the aforementioned risks were effectively controlled.

- **Budget Management:**

  The project's financial considerations were broken down into several stages, such as database integration, testing, front-end design, and back-end implementation. This thoughtful distribution guarantees that every aspect of the project is adequately supported to provide the website's necessary performance and quality. The overall budget's structure, which is mostly connected to cost-recovery analysis, determines the project's size and character.

- **Monitoring and Control:**

  Success reports and feedback from stakeholders made it easier to align with goals. The methods made it possible to explore possibilities for change during project development.

- **Completion and Evaluation:**

The project was effectively finished in order to meet its goals, and it also

cost a relatively small amount of money and time overall. Some minor adjustments were found through testing and feedback, and these should be further applied in future editions.

5.4 Complex Engineering Problem

Creating a website for ship passengers came with a number of difficult planning, technical, and critical issues. This required linking several systems, satisfying the demands of numerous stakeholders, and preserving independence and resilience in a short amount of time.

The project team overcame these obstacles to offer a workable system for the company, as well as a means of future system improvement. This experience strengthens the role of engineering approaches in comparatively heuristic situations and emphasizes the advantages of an organized approach to problem solving.

5.4.1 Complex Problem Solving

Table 5.1: Mapping with complex problem solving.

Category	Justification	Rationale
EP1: Depth of Knowledge	Knowledge required spans web development, cloud services, UI/UX design, and database optimization.	Proficiency with Laravel (PHP), MySQL, front-end design concepts, and cloud-based services are necessary for this project. MVC architecture, security protocols, and responsive web design are examples of core knowledge.

EP2: Range of Conflicting Requirements	Conflicts arise when incorporating multimedia elements without sacrificing performance, guaranteeing scalability without sacrificing simplicity, and striking a balance between user engagement and administrative control.	The project must balance a number of needs, including giving administrators powerful tools and a user-friendly interface, allowing for real-time updates, and achieving low-latency performance.
EP3: Depth of Analysis	In-depth planning for user interface design, secure authentication, multimedia handling, and administrative efficiency.	The project's main objectives are to manage multimedia information (such as booking), establish safe registration procedures, design an intuitive user interface, and provide smooth communication between administrators and users.
EP4: Familiarity of Issues	Media rendering (pictures and movies), database optimization, secure authentication, and dynamic user interaction design are common problems.	Web development sometimes involves challenges, particularly in maintaining responsive and secure systems while guaranteeing smooth processing of real-time updates and multimedia uploads.
EP5: Extent of Applicable Codes	Utilizes Laravel's MVC architecture, PHP best practices, MySQL database standards, and modern web security protocols.	In order to ensure compatibility, maintainability, and scalability across future upgrades, the project adheres to accepted coding techniques and security rules in web development.

EP6: Extent of Stakeholder Involvement	Involves users (passenger), administrators, and external service providers (e.g., payment gateways).	Involving stakeholders is essential: users register and keep updated on the platform, administrators oversee memberships and content, and outside providers guarantee smooth payment processing and security integration.
EP7: Interdependence	Backend services (MySQL, Laravel) are directly linked to the user interface, and admin approvals and registration are influenced by user authentication.	Significant interdependence exists between system components, with the success of the interface, multimedia features, and notifications relying on backend efficiency and real-time data updates.

Mapping with Knowledge Profile for EP1

This table 5.4.1.2 is designed to map the EP1 to the Knowledge Profile.

Table 5.2: Mapping with knowledge Profile.

Category	Justification	Rationale
K3: Engineering Fundamentals	Basic knowledge of web development, database management, and UI/UX principles. This includes a foundational understanding of programming languages, security protocols, and web storage.	Your website uses Laravel (PHP), MySQL, and UI/UX concepts to create a safe and engaging platform for administrators and users. It is based on basic engineering understanding of web development.
K4: Specialist Knowledge	Expertise in Laravel, MySQL, MVC architecture, security protocols, and advanced UI/UX design for web applications.	Expertise in MySQL database administration, Laravel backend development, and UI/UX design to create user interfaces that are easy to use

		and efficient while guaranteeing safe and expandable data storage.
K5: Engineering Design	Managing data and multimedia material in a web application, designing user interfaces, and developing user-friendly navigation routines.	Involves designing the website's layout, navigation, and media handling (e.g., PDFs, images) from the database, ensuring a seamless experience while maintaining usability, security, and performance.
K6: Engineering Practice	Use of frameworks, libraries, and APIs in a practical way for web development, including Laravel, MySQL, and security protocols.	Using MySQL for data management, secure authentication for user administration, and Laravel for MVC design, engineering standards are applied to ensure dependable and effective backend functionality.
K8: Research Literature	Research into web development frameworks, cloud storage services, security practices, and best practices for UI/UX design.	Staying up to date with the latest research, documentation, and best practices for web development frameworks (Laravel), database management (MySQL), security protocols, and UI/UX standards to ensure a modern and secure platform.

5.4.2 Engineering Activities

This project involves a variety of engineering tasks, such as database configuration, front-end and back-end coding, website layout design, and testing. While the back-end programming made sure that user registration, membership administration, and notification updates were all done securely and effectively, the front-end design concentrated on creating an intuitive user interface that made navigation easy. Usability tests, security audits, and performance evaluations were all part of the testing phase to make sure the system fulfilled its objectives and functioned effectively under stress.

Table 5.1: Mapping with Engineering Activities.

Category	Justification	Rationale
EA1: Range of Resources	Involves using resources such as Laravel (PHP), MySQL for database management, cloud services for storage, and web frameworks (e.g., Bootstrap) for front-end design.	The project uses a range of technological resources, including Laravel for backend development, MySQL for database management, and cloud services for media storage, alongside web frameworks like
EA2: Level of Interaction	The website requires significant user interaction, especially with the registration process, notifications, media viewing (e.g., images and achievements), and admin interfaces.	High user interaction is needed, from passenger signing up for the Ship Ticket Booking program to receiving real-time notifications and interacting with the passenger, booking, and other interactive elements like the discount.

EA3: Innovation	Implementing dynamic content updates, interactive features like the Cadet Corner and honor board, and seamless integration with cloud storage for multimedia content (booking, PDFs).	Dynamic features that engage users, like real-time updates, booking, dixcount, and interactive aspects that encourage community and involvement, as well as cloud storage for multimedia content, are examples of innovation.
EA4: Consequences for Society and Environment	The website contributes to a more organized and efficient Ship Ticket Booking program, promoting leadership and community among user, while reducing the reliance on paper-based systems.	The platform has positive social implications by improving communication and engagement among user and administrators. Environmentally, it reduces paper usage and promotes a digital-first approach for Ship Ticket Booking activities.
EA5: Familiarity	Although the engineering tasks involved are typical in web development, specific expertise is needed to integrate various interactive features, user roles, and secure payment methods.	While familiarity with common web development technologies (Laravel, MySQL, etc.) is necessary, specific knowledge is needed to integrate many dynamic elements, such as real-time user interactions and secure payment systems.

5.5 Summary

This chapter covers a green approach to system development, the system's beneficial effects on society and the environment, and conformity with technical standards. The website for Ship Ticket Booking was created with a strong focus on meeting customer needs and resolving a number of project management issues, all the while upholding moral standards and project viability. It has been determined that the successful resolution of engineering difficulties and incorporation of industry standards has produced a superior system that benefits all parties involved.

Chapter 6

Conclusion

6.1 Summary

One significant step in increasing digitization and streamlining the orderly system for its stakeholders is the creation of the Ship Ticket Booking website. Efficiency and efficacy have been attained through the website's registration, membership, and communication functions, which remove the difficulties associated with putting manual processes into place. Ethical norms, data protection, and user trust are explained by objective security measures, and the web application's modular design facilitates future expansion and enhanced functionality.

The project faced a number of challenges at first, but it ultimately succeeded in creating a solution that works for both the company and the user. It enhances member participation in addition to making the journey process easier. By establishing permanent innovation, this website can serve as a model for future developments in technology-supported solutions for these kinds of companies.

6.2 Limitation

The following list of restrictions applies to the Ship Ticket Booking website:

- **Limited Interactivity:** Although it has features like registration, ship seat discounts, discovery of routes, notices, and management, it does not yet have interactive features like forums, chats, or meeting start buttons, which might boost user interest.

- **Reliance on Internet Connection:** The website needs a consistent internet connection in order for users to interact with its functional features. In places where internet availability is an issue, this may somewhat diminish usability and interactivity.

- **Single sign-on:** This employs the conventional login procedure, however it could not be sufficient for future security demands like two-factor authentication.

- **Restricted offline functionality:** Users who are not online cannot view notifications or access any other resources because there is no offline mode.

- **Lack of language localization:** This site may not be well-liked by people who do not speak that language because it solely supports the native tongue and does not support other languages.

6.1 Future Work

There are several opportunities to further enhance the Ship Ticket Booking website for all users:

- **Interactive Features:** Include interactive elements such as forums or chat rooms where ship passengers can discuss their experiences, seek advice, and share ideas. This will strengthen the sense of community and facilitate peer-to-peer support.

- **Mobile Optimization:** Ensure that the website is fully optimized for mobile devices, allowing users to easily access and register information from smartphones and tablets. Regular Updates: Implement a system for regular content updates, including news about recent travel events, travel activities, and achievements, to keep the site current and engaging.

- **Social Media Integration:** Connect the website to social media platforms to expand and enhance communication. Sharing updates and highlights on platforms such as Facebook, Instagram, and Twitter can attract more interest and engagement.

- **Feedback System:** Introduce a feedback system where users can provide suggestions and report issues, which helps in continuous improvement.

- **Integration with GPS and Live Tracking:** Enable passengers to track the live location of the ship in real-time. Provide estimated arrival/departure times using marine GPS data. Integrate weather updates and sea state alerts.

- **Dynamic Pricing and Offers:** Implement dynamic fare calculations based on demand, travel dates or cabin class. Introduce seasonal discounts, loyalty rewards and promo codes.

- **Multi-operator Integration:** Expand the system to support multiple ferry/cruise operators. Allow users to compare routes, times and prices between different providers (e.g., "Shiphopper").

- **Mobile App Development:** Launch dedicated Android and iOS apps with offline ticket storage, push notifications and biometric login. Add NFC or QR-based contactless boarding via the app.

- **AI-based recommendations:** Use AI to recommend travel routes, best travel times, or alternative options based on user behavior and booking history.

- **Multilingual and accessibility enhancements:** Improve accessibility for visually/hearing impaired users (screen reader compatibility, voice booking support). Expand support for more languages for international users.

- **Chatbot and customer support automation**: Introduce an AI-powered chatbot for real-time customer queries. Automated FAQs, booking support, and complaint management.

- **Integration with hotel/transportation services:** Partner with hotels and ground transportation providers to offer package deals (e.g., ship + hotel + shuttle).

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