A REPORT OF SIX MONTHS INDUSTRIAL TRAINING

at

[Proveb Technosoft]

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF

BACHELOR OF TECHNOLOGY

(Computer Science and Engineering)



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CANDIDATE'S DECLARATION

I **ABHIRAJ KUMAR** hereby declare that I have undertaken 6 months Industry Oriented Project Training at **Proveb Technosoft** during a period from 1st Jan to 10th May in partial fulfilment of requirements for the award of degree of B. tech (Computer Science and Engineering) at BABA BANDA SINGH BAHADUR ENGINEERING COLLEGE, FATEHGARH SAHIB. The work which is being presented in the training report submitted to Department of Computer Science and Engineering at BABA BANDA SINGH BAHADUR ENGINEERING COLLEGE, FATEHGARH SAHIB is an authentic record of training work.

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Signature of Internal Examiner
Examiner

Signature of External

Abstract

This project report outlines the development of a comprehensive Flight Booking website using React.Js, Node.Js, a powerful Express.Js framework, as part of a final year project. The website leverages the Amadeus API for flight information and booking functionalities and integrates the PhonePe payment gateway for secure and efficient transaction handling.

The primary objective of this project is to create a user-friendly, efficient, and secure online platform for booking flights, providing a seamless experience from search to payment. The application features real-time flight data retrieval, booking confirmations, and a robust payment processing system. By utilizing the Amadeus API, the website ensures access to a wide range of flights and up-to-date information, enhancing the user experience with accurate and comprehensive options.

The integration of the PhonePe payment gateway addresses the need for secure and reliable financial transactions. This ensures that users can book their flights with confidence, knowing their payment details are handled with the utmost security.

The development process involved several stages, including requirements gathering, system design, implementation, testing, and deployment. Each stage was meticulously executed to ensure the final product met the desired specifications and user needs. The project employs best practices in web development and security to deliver a robust and scalable solution.

This report provides an in-depth look at the technical aspects of the project, including the architecture of the application, the integration process for both the Amadeus API and PhonePe payment gateway, and the various challenges encountered and solutions implemented. It also highlights the testing procedures used to validate the functionality and security of the system.

Overall, this project demonstrates the practical application of web development skills and the ability to integrate third-party services to enhance functionality, providing a valuable resource for users seeking to book flights online efficiently and securely.

Acknowledgement

I, Abhiraj Kumar, would like to extend my heartfelt gratitude to all those who have supported and guided me throughout the development of my final year project, the Flight Booking website.

First and foremost, I would like to thank my project supervisor, Abhiraj Anand, for their invaluable guidance, insightful feedback, and constant encouragement. Their expertise and support have been crucial in steering this project to its successful completion.

I am also deeply grateful to the faculty members of CSE department at BABA BANDA SINGH BAHADUR ENGINEERING COLLAGE for providing me with the knowledge and resources needed to undertake this project. Their teaching and mentorship have been instrumental in shaping my technical skills and understanding of the subject matter.

Special thanks go to my classmates and friends, whose constructive discussions and moral support have been a source of motivation and inspiration throughout this journey.

I would like to acknowledge the support and cooperation of my family, whose patience and understanding have been unwavering. Their belief in my abilities has given me the strength to persevere through challenges.

Finally, I would like to express my appreciation to the developers and contributors of Node.Js, Express.Js, React.Js, Amadeus API, and PhonePe, whose technologies and documentation were critical to the successful implementation of this project.

Thank you all for your invaluable support and encouragement.

Sincerely,

Saurabh Suman

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INTRODUCTION OF ORGANIZATION

Proveb Technosoft Pvt. Ltd.

Proveb Technosoft Pvt. Ltd., located in Bangalore's Electronic City Phase 1, is a leading technology solutions provider specializing in the development of travel booking websites and related software applications. Established with a vision to revolutionize the travel industry through innovative technological solutions, Proveb Technosoft has carved a niche for itself by delivering high-quality, reliable, and user-centric products.

The company is known for its expertise in creating comprehensive travel booking platforms that cater to various aspects of the travel industry, including flight bookings, hotel reservations, and holiday packages. With a strong focus on customer satisfaction, Proveb Technosoft integrates advanced features and the latest technologies to enhance the user experience and streamline booking processes.

Core Services and Expertise

Proveb Technosoft offers a wide range of services tailored to meet the needs of the travel industry. These services include:

- Website Development: Custom travel booking websites designed to provide seamless and efficient booking experiences for users.
- **API Integration:** Integration of various third-party APIs, such as Amadeus and other travel data providers, to ensure real-time access to flight, hotel, and travel information.
- **Payment Gateway Integration:** Secure and reliable payment processing solutions to facilitate smooth financial transactions.
- **Mobile App Development:** Development of mobile applications for travel bookings, enhancing accessibility and convenience for users on the go.
- **Software Maintenance and Support:** Ongoing support and maintenance services to ensure the smooth operation and continuous improvement of travel booking systems.

Technological Proficiency

Proveb Technosoft employs a team of highly skilled professionals with expertise in a range of technologies, including Node.Js, Express.Js, React.Js, JavaScript, and various front-end and backend frameworks. The company prides itself on staying up-to-date with the latest technological advancements and industry trends, ensuring that its solutions are both cutting-edge and robust.

Commitment to Excellence

Proveb Technosoft is committed to delivering excellence through every project. The company follows a client-centric approach, working closely with clients to understand their unique requirements and deliver tailored solutions that meet their specific needs. This dedication to quality and customer satisfaction has earned Proveb Technosoft a reputation as a trusted partner in the travel technology industry.

Industrial Training Experience

During my industrial training at Proveb Technosoft Pvt. Ltd., I had the opportunity to work on real-world projects and gain hands-on experience in the development of travel booking websites. This training provided me with invaluable insights into the industry's best practices, advanced technical skills, and a deeper understanding of the travel technology landscape. The supportive and knowledgeable team at Proveb Technosoft played a crucial role in enhancing my learning experience and preparing me for a successful career in web development and technology solutions.

SOFTWARE TRAINING WORK UNDERTAKEN

During my industrial training at Proveb Technosoft Pvt. Ltd., I had the opportunity to work extensively on various aspects of software development, with a specific focus on the travel booking domain. This training was instrumental in enhancing my technical skills and providing practical experience in a professional setting. The key areas of training and the skills acquired are outlined below:

1. Express.Js Framework

I gained in-depth knowledge and hands-on experience with the Express framework, a powerful and lightweight Node.Js runtime environment. Key learning outcomes included:

- MVC Architecture: Understanding and implementing the Model-View-Controller (MVC) architecture to build scalable and maintainable web applications.
- **Database Interaction:** Using MongoDB Active Record Class for efficient database management and operations.
- Form Handling and Validation: Implementing secure and user-friendly form handling and validation techniques.
- Session Management: Managing user sessions and authentication processes.

2. React.Js Library

In addition to Express.Js, I also trained on the React.Js libraries, known for its elegant syntax and powerful features. Key learning outcomes included:

- **Routing and Middleware:** Setting up and managing application routes and middleware for request filtering and handling.
- **Eloquent ORM:** Using React.Js Eloquent ORM for advanced api interactions and relationships.
- Blade Templating Engine: Creating dynamic and reusable views

3. API Integration

A significant part of my training involved learning how to integrate third-party APIs to enhance the functionality of web applications. Key learning outcomes included:

- Amadeus API: Integrating the Amadeus API to retrieve and display real-time flight information and booking options.
- **RESTful Services:** Consuming RESTful web services to connect with external data sources and services.
- Error Handling: Implementing robust error handling and fallback mechanisms to ensure seamless user experiences even when API services are unavailable.

4. Payment Gateway Integration

I learned about integrating secure payment gateways to facilitate online transactions. Key learning outcomes included:

- **PhonePe Integration:** Implementing the PhonePe payment gateway to process payments securely and efficiently.
- **Payment Flow Management:** Designing and managing the end-to-end payment flow, including transaction handling, confirmations, and user notifications.
- **Security Measures:** Ensuring data security and compliance with industry standards for handling financial transactions.

5. Front-End Development

My training also encompassed front-end development, focusing on creating responsive and user-friendly interfaces. Key learning outcomes included:

- HTML/CSS: Crafting structured and styled web pages using HTML and CSS.
- JavaScript: Enhancing interactivity and dynamic content handling with JavaScript.
- **Responsive Design:** Using frameworks like Bootstrap to ensure websites are responsive and accessible on various devices.

6. Back-End Development

I gained experience in back-end development, focusing on server-side logic and database management. Key learning outcomes included:

- Express.Js: Writing efficient and secure server-side code using Express.
- **Database Management:** Designing and managing relational databases using MongoDB, including writing complex queries and optimizing database performance.
- **API Development:** Creating custom APIs to expose application functionality and data to external clients.

Conclusion

The industrial training at Proveb Technosoft Pvt. Ltd. provided me with a comprehensive understanding of both front-end and back-end development, API integration, and secure payment processing. This hands-on experience has significantly enhanced my technical skills and prepared me for future challenges in the field of web development.

INDUSTRIAL TRAINING WORK UNDERTAKEN

During my industrial training at Proveb Technosoft Pvt. Ltd., I had the opportunity to work on three distinct projects, each designed to enhance my understanding and skills in web development. These projects provided practical experience in both front-end and back-end development, API integration, and secure payment processing. Below is a detailed account of the work undertaken during my training period:

1. Inventory POS

Objective: To create a sample user registration system that allows users to register, log in, view registered users, and edit or delete user information.

Technologies Used:

- React.Js
- Express.Js Framework
- MongoDB
- HTML/CSS
- JavaScript

Key Features:

- User Registration: Implemented a form to collect user details such as username, password, and email, with validation to ensure data integrity.
- **User Login:** Developed a secure login system that authenticates users based on registered credentials.
- User Management: Created a dashboard to display a list of registered users, with options to edit and delete user information.
- **CRUD Operations:** Implemented Create, Read, Update, and Delete operations for user management.

Learning Outcomes:

- Gained proficiency in the Express.Js framework and MVC architecture.
- Enhanced skills in form handling, validation, and session management.
- Learned how to perform CRUD operations in a web application.

2. Flight Booking System

Objective: To develop a flight booking website using Express.Js, Node.Js and integrate the Amadeus API and PhonePe payment gateway.

Technologies Used:

- React.Js
- Express Framework
- Amadeus API
- PhonePe Payment Gateway
- MongoDB
- HTML/CSS
- JavaScript

Key Features:

- **Flight Search and Booking:** Integrated the Amadeus API to fetch real-time flight data and allow users to search for and book flights.
- **User Authentication:** Implemented user registration and login functionality for secure access.
- **Payment Integration:** Integrated the PhonePe payment gateway to facilitate secure online transactions.
- **Booking Management:** Developed features for users to view, manage, and cancel their flight bookings.

Learning Outcomes:

- Acquired expertise in API integration, particularly with the Amadeus API.
- Gained experience in integrating a payment gateway and handling secure transactions.
- Improved understanding of the end-to-end process of booking management.

3. MiniAirBnb(In Progress)

Objective: To develop a product management system using Express.Js, allowing the addition and management of product details.

Technologies Used:

- React.Js
- Express.Js Framework
- MongoDB
- HTML/CSS
- JavaScript

Key Features:

a) User Management:

- Implemented features for user registration, login, and profile management.
- Integrated user authentication and authorization using Express.Js.

b) Property Management:

- Developed functionalities for hosts to add, view, edit, and delete property listings.
- Included features to upload property images, set prices, and manage availability.

c) Review and Rating:

- Added functionalities for users to leave reviews and ratings for properties they have stayed in.
- Enabled hosts to respond to reviews, enhancing user engagement and trust.

Learning Outcomes:

- Gained proficiency in the Express framework, including its Eloquent ORM and Blade templating engine.
- Enhanced skills in creating and managing complex relational database schemas.
- Learned to implement comprehensive CRUD functionalities in a web application.

The industrial training at Proveb Technosoft Pvt. Ltd. provided me with invaluable hands-on experience in web development using both Express.Js and Laravel frameworks. Through the development of these projects, I enhanced my technical skills in various aspects of web development, including front-end and back-end development, API integration, and payment gateway integration. This training has prepared me to tackle real-world challenges in the field of web development and contribute effectively to future projects.

PROJECT WORK

Introduction:

Travels is a comprehensive flight booking website developed as part of my final year project using, React.Js, Node.Js, a robust Express.Js framework. The primary objective of Travels is to provide users with a seamless, efficient, and secure platform for searching, booking, and managing flight reservations. The website integrates the Amadeus API for real-time flight information and the PhonePe payment gateway for secure transactions, ensuring a complete and user-friendly booking experience.

Problems Addressed:

The development of Travels aims to address several key issues faced by travelers in the online flight booking domain:

- **Fragmented Information:** Users often need to visit multiple websites to compare flight options, leading to a time-consuming process.
- **Complex Booking Processes:** Existing booking platforms can be cumbersome, with complicated interfaces and multiple steps to complete a booking.
- **Payment Security:** Ensuring secure online transactions is a major concern, with users wary of sharing sensitive payment information.
- **Booking Management:** Many platforms lack effective tools for users to manage their bookings, including modifications and cancellations.

Technology Used:

Travels leverages a variety of technologies to deliver a robust and scalable solution:

- **Express.js:** Express.js, or simply Express, is a back-end web application framework for building RESTful APIs with Node.js, released as free and open-source software under the MIT License. It is designed for building web applications and APIs. It has been called the de facto standard server framework for Node.js.
- Amadeus API: Integrated to fetch real-time flight information, providing users with up-to-date flight options and pricing.
- **PhonePe Payment Gateway:** Used for secure and efficient payment processing, ensuring user data protection and transaction security.
- MongoDB: MongoDB is a source-available, cross-platform, document-oriented database program.
 Classified as a NoSQL database product, MongoDB utilizes JSON-like documents with optional
 schemas. MongoDB is developed by MongoDB Inc. and current versions are licensed under the
 Server-Side Public License.
- HTML/CSS: For creating structured and styled web pages.
- **JavaScript and jQuery:** To enhance interactivity and improve the user experience.

Goals

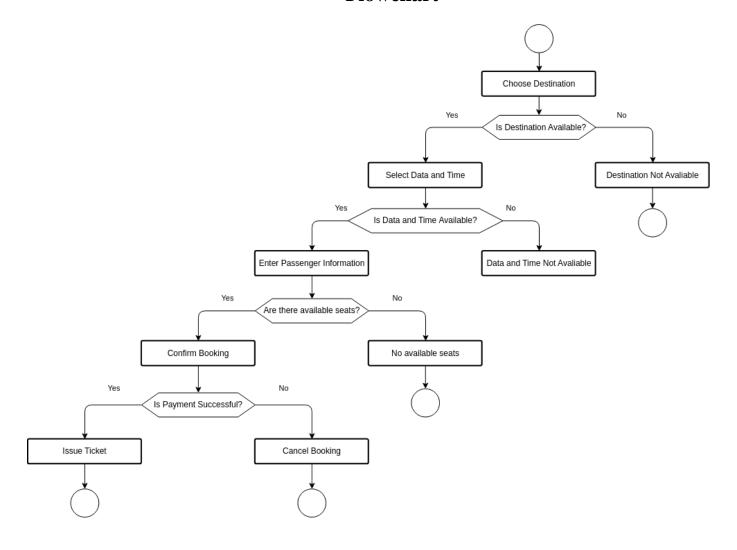
The primary goals of Travels are as follows:

- **User-Friendly Interface:** Design a clean, intuitive interface that simplifies the flight search and booking process.
- **Real-Time Data:** Provide users with accurate and up-to-date flight information through seamless integration with the Amadeus API.
- **Secure Transactions:** Ensure the highest level of security for online payments using the PhonePe payment gateway.
- Efficient Booking Management: Offer comprehensive tools for users to manage their bookings, including viewing, modifying, and canceling reservations.

Key Features

- **Flight Search:** Users can search for flights based on various criteria such as destination, departure date, and class of service.
- **Booking Process:** A streamlined process that guides users through selecting flights, entering passenger details, and making payments.
- User Authentication: Secure registration and login system to protect user data.
- **Payment Integration:** Secure payment handling via PhonePe, ensuring that user transactions are protected.
- **Booking Management:** Users can view their booking history, modify existing bookings, and cancel reservations if needed.

Flowchart



Literature Survey

The development of the Travels flight booking website involved a comprehensive review of existing literature and technologies in the domain of online travel booking systems. This literature survey explores the evolution, current trends, and technological advancements in the field, providing a foundational understanding that informed the design and implementation of Travels.

1. Evolution of Online Travel Booking Systems

The transition from traditional travel agencies to online booking platforms has revolutionized the travel industry. Early online booking systems, such as those developed in the 1990s, offered basic search and booking functionalities. Over time, advancements in web technologies and the increasing demand for convenience led to the development of more sophisticated platforms.

- Early Systems: Initial systems focused on providing basic flight search and booking capabilities. These platforms were often limited in terms of user interface and functionality.
- **Integration of APIs:** With the advent of APIs (Application Programming Interfaces), travel booking systems began to integrate real-time data from airlines, hotels, and other service providers. This allowed for more accurate and comprehensive booking options.
- **Mobile Platforms:** The rise of smartphones and mobile applications further transformed the industry, making travel booking accessible anytime and anywhere.

2. Current Trends in Online Travel Booking

Modern travel booking systems are characterized by several key trends aimed at enhancing user experience and functionality:

- **Personalization:** Platforms use machine learning algorithms to provide personalized recommendations based on user preferences and past behavior.
- **Seamless Integration:** Integration with multiple third-party services, such as airlines, hotels, car rentals, and payment gateways, ensures a comprehensive and seamless booking experience.
- Enhanced Security: With growing concerns over data privacy and security, modern systems implement advanced security measures, including secure payment gateways and encryption technologies.
- User Experience: A strong focus on user-friendly interfaces and responsive design ensures that platforms are easy to use across various devices.

3. Technological Advancements

Several technological advancements have played a critical role in the development of contemporary travel booking systems:

- **APIs and Web Services:** The use of APIs, such as the Amadeus API, allows for real-time access to flight information and booking services. APIs facilitate the integration of various services, providing users with a unified platform.
- **Frameworks and Libraries:** The use of robust web frameworks like Express.Js has streamlined the development process, enabling the creation of scalable and maintainable applications.
- **Payment Gateways:** Secure payment gateways like PhonePe provide reliable transaction processing, ensuring user trust and convenience.
- **Cloud Computing:** Cloud services offer scalable infrastructure, allowing platforms to handle large volumes of traffic and data without compromising performance.

4. Challenges in Online Travel Booking

Despite significant advancements, online travel booking systems face several challenges:

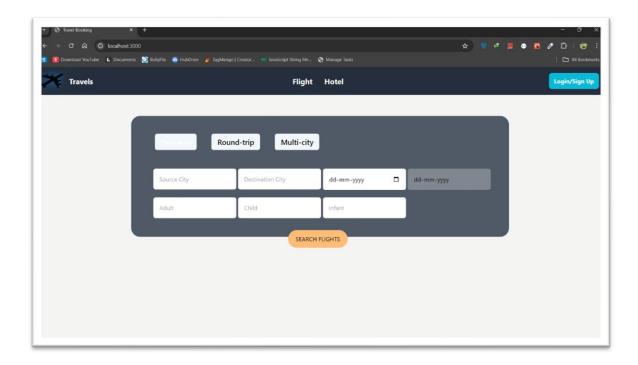
- **Data Accuracy:** Ensuring the accuracy and timeliness of flight and hotel information is crucial for user satisfaction.
- **Security Concerns:** Protecting user data and financial transactions from cyber threats is a continuous challenge.
- Complexity of Integration: Integrating multiple services and APIs can be technically challenging and requires robust error handling and fallback mechanisms.

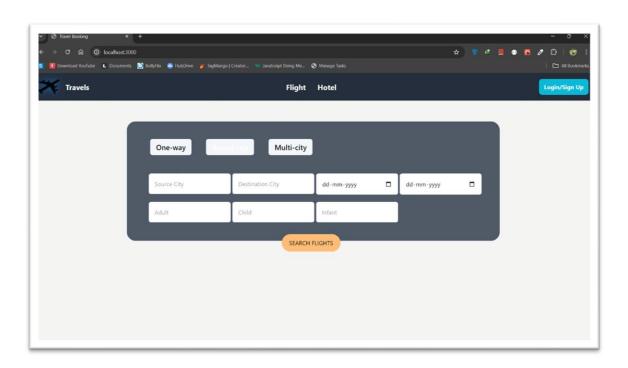
5. Case Studies and Related Work

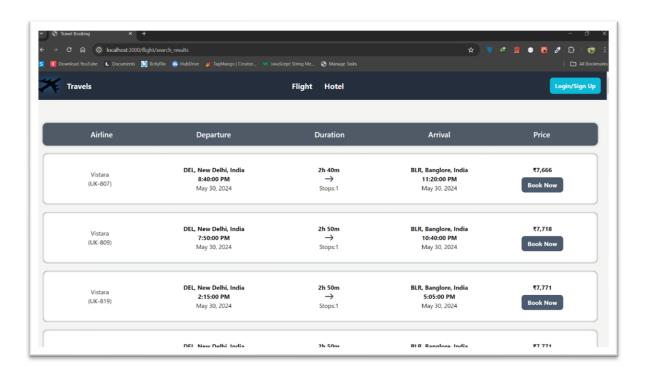
Several existing travel booking platforms have set benchmarks in the industry, serving as valuable references for the development of Travels:

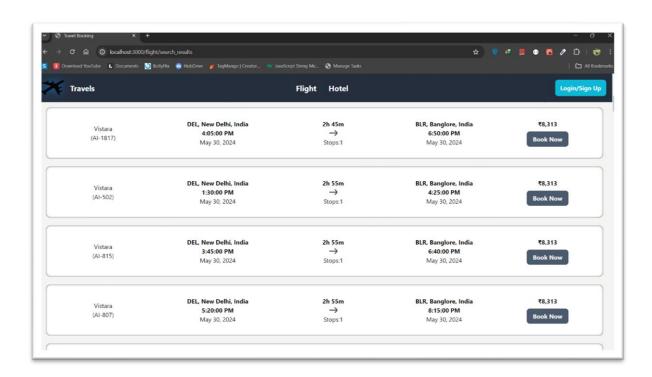
- **Expedia:** Known for its extensive integration with airlines, hotels, and car rental services, Expedia offers a comprehensive travel booking experience. Its user-friendly interface and personalized recommendations set a high standard for user experience.
- **Booking.com:** A leader in hotel reservations, Booking.com leverages user reviews and ratings to enhance trust and decision-making. The platform's seamless integration with various services provides a holistic travel planning solution.
- **Skyscanner:** Focused on flight search and comparison, Skyscanner's use of real-time data and advanced search filters offers users detailed and accurate flight options. Its mobile application further enhances accessibility.

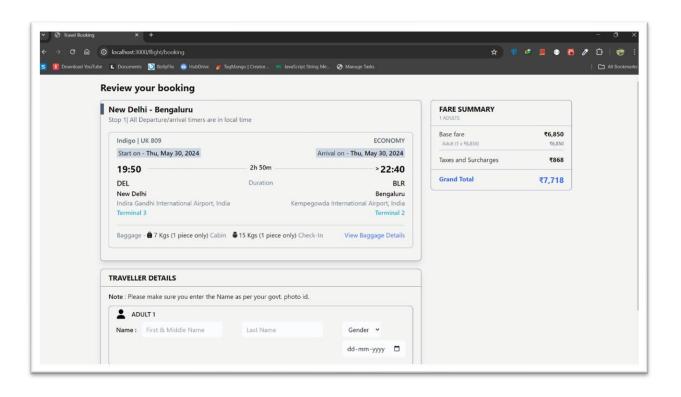
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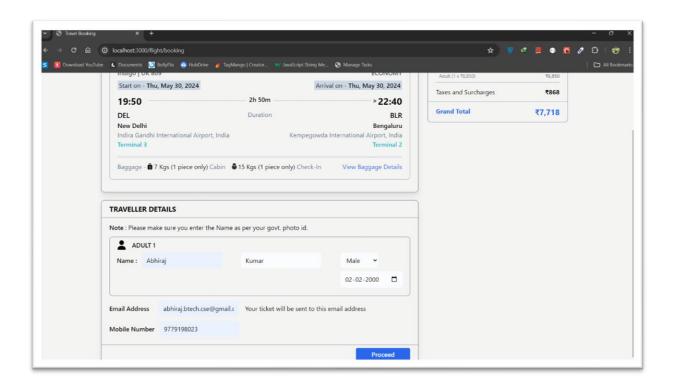


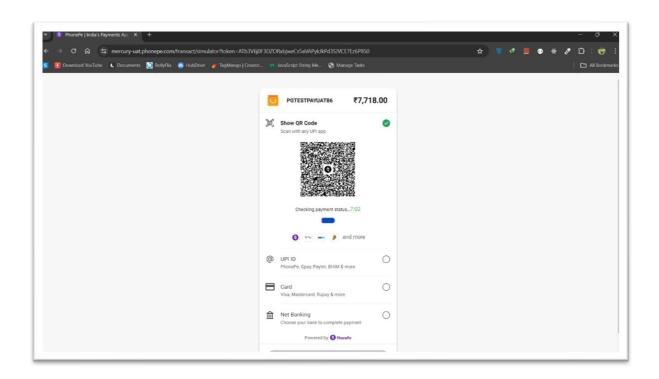


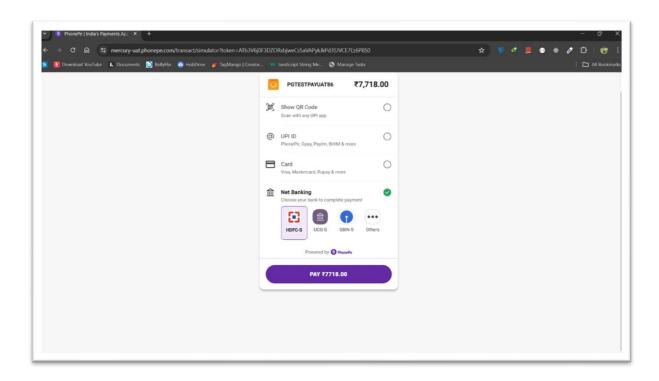


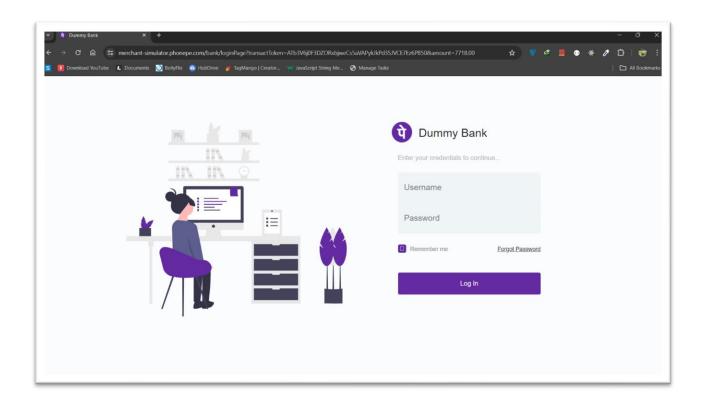


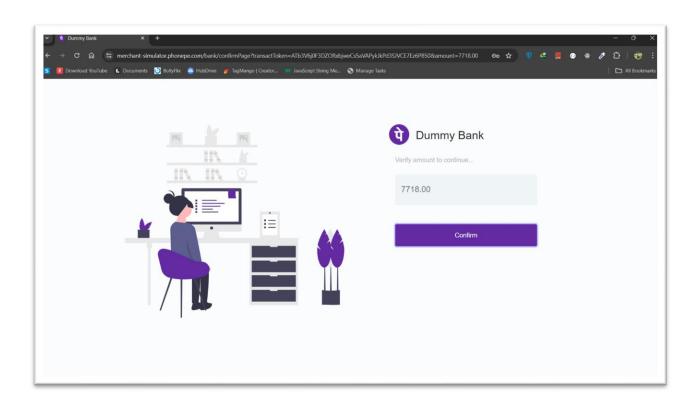


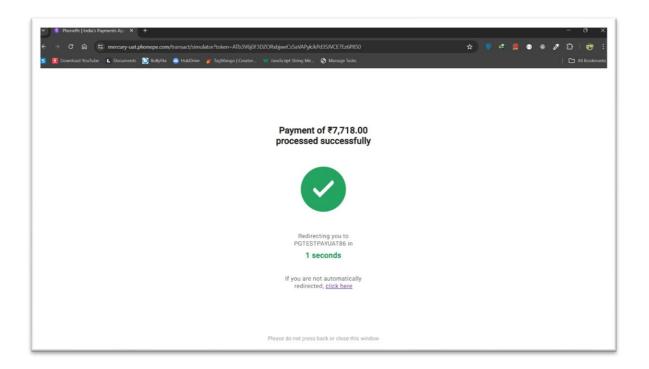


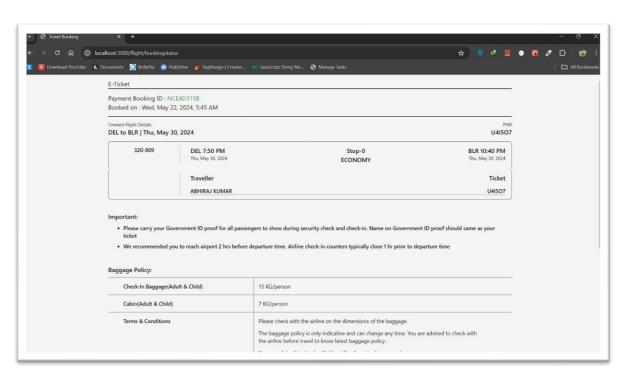


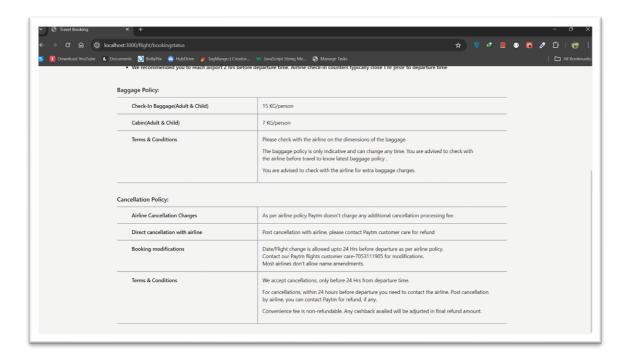












CONCLUSION AND FUTURE SCOPE

CONCLUSION

The Travels project showcases the integration of modern web technologies and third-party services to create a robust, user-friendly flight booking platform. By addressing key issues in the online booking process and focusing on security and user experience, Travels has the potential to become a valuable tool for travelers. The future scope of the project includes several enhancements that will further improve its functionality and user reach, ensuring that Travels remains competitive and relevant in the evolving travel industry.

FUTURE SCOPE

Travels has the potential for several enhancements and future developments:

- **Mobile Application:** Developing a mobile app for Travels to increase accessibility and convenience for users on the go.
- Multi-Currency Support: Integrating multi-currency payment options to cater to international users.
- Additional Payment Gateways: Adding more payment gateways to provide users with multiple payment options.
- Advanced Search Filters: Implementing advanced search filters to allow users to search for flights based on more specific criteria such as airline preference, stopovers, and flight duration.
- Loyalty Programs: Introducing a loyalty program to reward frequent users with discounts and offers.

REFERENCE

- 1. **Express.Js Documentation:** For understanding the framework and its features. Available at: Express.Js Documentation.
- 2. **Amadeus API Documentation:** For integrating flight information and booking functionalities. Available at: Amadeus for Developers.
- 3. **PhonePe Payment Gateway Documentation:** For implementing secure payment processing. Available at: PhonePe for Business.
- 4. **MongoDB Documentation:** For database management and operations. Available at: <u>MongoDB</u> Documentation.
- 5. **HTML/CSS/JavaScript Tutorials:** Various online resources and tutorials for front-end development.

The Travels project showcases the integration of modern web technologies and third-party services to create a robust, user-friendly flight booking platform. By addressing key issues in the online booking process and focusing on security and user experience, Travels has the potential to become a valuable tool for travelers. The future scope of the project includes several enhancements that will further improve its functionality and user reach, ensuring that Travels remains competitive and relevant in the evolving travel industry.