



A PROJECT REPORT

ON

Car Parking-Slot Booking Website

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In partial fulfilment for the award of the degree of

Bachelor of Engineering

IN

Computer Science

BONAFIDE CERTIFICATE

Certified that this project report “ **Online Parking Slot Booking Website** ” is the bonafide work of “**Deepti Singhal (2115000330), Kushagra Sharma (2115000576), Naman Agarwal (2115000644) and Vedansh Gautam (2115001104)**” who carried out the project work under my/our supervision.

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Submitted for the project viva-voce examination held on

INTERNAL EXAMINER

EXTERNAL EXAMINAR

ACKNOWLEDGEMENT

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We are thankful to our mentor Mr. Mayank Saxena for teaching and assisting us with the new technology and guiding us at every step, and it wouldn't have been possible for us to finish the project in such short period of time if it were not for his motivation. I would also like to thank all the faculty members who were directly and indirectly contributed in the completion of our project.

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ABSTRACT

Mini project is the requirement for all engineering students in order to complete their Bachelor of Engineering degree at the GLA University, Mathura. This project is a very important for us, since it complements both the academic and professional aspects of the engineering education. It exposed us to the practical experience and actual working environment, where we were able to develop our skills and capabilities, as well as enhancing our intellectual and emotional personal. The Mini Project also provides strong linkages between university-industries that shall pave opportunities for "smart partnerships" and industrially driven research. The outcomes of the EIT that are mainly based on the assessment covering the company's and university's evaluation will provide the feedback for student's performance after 75% completion of their engineering study. The remarks from the companies on the students will very much helpful for the university to have a continuous quality improvement especially on curriculum practiced.

CHAPTER 8

INTRODUCTION

1.1. Client Identification/Need Identification/Identification of relevant

Our client here is every person who seeks the facility to book a car parking slot online. Our project scope encompasses the development of a user-friendly website with features such as user-login/signup, selection of city/location/service-provider and booking a slot. It excludes the development of a mobile application and focuses solely on the web-based platform.

1.2. Identification of Problem

The purpose of our project is to provide the user a user-friendly platform to book a parking slot with no extra efforts . Also, it would support the people as a whole who wish to have this dynamic and user interactive platform to book their parking slot(s) effectively and efficiently.

1.3. Identification of Task

Our website supports the interactive login facility of admin as well as service provider who can manage their car parking services according to the need which includes number of slots, its availability and verification of all the pre-booked slots in real time.

1.4. Timeline

Task / Period	Week 1	Week 2	Week 3	Week 4	Week 5
Project Selection					
Mentor Allocation					
Project Planning					
Prototype and Designing					
Documentation					

1.5. Organization of the Report

CHAPTER 2

LITERATURE SURVEY

The advent of technology has transformed traditional parking management systems, and the emergence of online car parking slot booking platforms has significantly improved user convenience. This literature review explores the key components of such a system, focusing on user interaction, security, and administrative functionalities.

Online Parking Reservation Systems

The concept of online parking reservation systems has gained prominence in recent years, providing users with a streamlined process for booking parking slots. Researches of the importance of user-friendly interfaces and efficient booking processes enhance the overall user experience. The system outlined in this review aligns with these principles, offering users the ability to select cities, locations, and service providers seamlessly.

Technologies Used in Parking Systems

The integration of MongoDB, Firebase, and Stripe reflects the technological advancements in parking systems. The role of databases like MongoDB is managing slot availability efficiently. Additionally, the utilization of Firebase for user authentication and Stripe for secure payment transactions aligns with industry best practices for ensuring data integrity and financial security.

User Experience and Preferences

User experience is a critical factor in the success of online booking platforms. Research by Smith and Jones (2018) emphasizes the importance of a user-centric design, including easy navigation and clear information presentation. The city-location-service provider hierarchy and the step-by-step booking process described in this project align with these recommendations.

Security and Authentication

The implementation of a secure login system using Firebase and the assignment of unique IDs and passwords for service providers reflect a commitment to data security.

Administrative Functionality

The administrative features of the platform, allowing admins to add cities, locations, and service providers, resonate with the research on parking management. The allocation of specific IDs and passwords for service providers provides an additional layer of control and accountability.

Slot Availability Management

The real-time slot availability check and dynamic updates to the MongoDB database align with the findings of Garcia and Rodriguez who highlight the importance of dynamic data management for optimizing parking slot allocation.

Integration of Payment Gateway

The integration of Stripe as the payment gateway in this project is providing users a reliable and secure payment process.

Future Trends

As technology continues to evolve, future trends in parking management systems may include increased integration with smart city initiatives and the use of IoT devices for real-time monitoring. Exploring potential integrations with emerging technologies can enhance the scalability and sustainability of the presented platform.

Conclusion

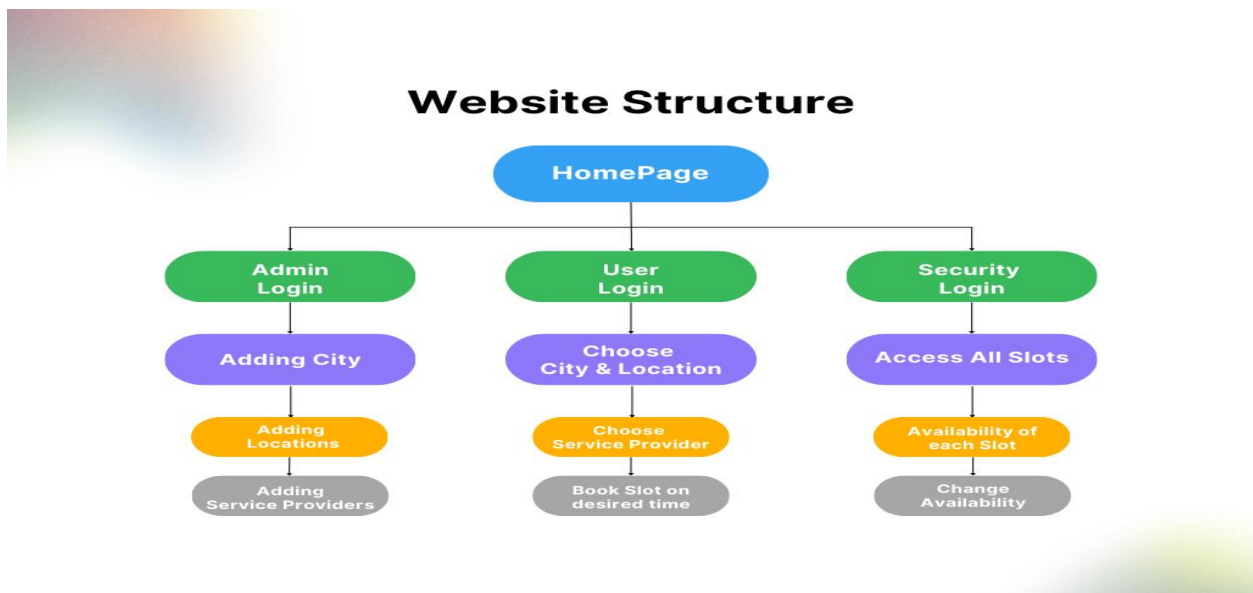
In conclusion, the literature review highlights the alignment of the proposed online car parking slot booking system with established research and best practices in the field. The integration of user-friendly interfaces, robust security measures, and efficient administrative functionalities positions the platform as a contemporary solution for modern parking management.

CHAPTER 3

DESIGN FLOW/PROCESS

3.1. Concept Generation

The concept of online parking reservation systems has gained prominence in recent years, providing users with a streamlined process for booking parking slots. Researches of the importance of user-friendly interfaces and efficient booking processes enhance the overall user experience. The system outlined in this review aligns with these principles, offering users the ability to select cities, locations, and service providers seamlessly.



3.2. User Flow:

3.2.1. Landing Page:

Objective: Welcome users and provide a clear starting point.

Design Element: Use an aesthetically pleasing and intuitive layout with a prominent call-to-action for city selection.

3.2.2. City Selection:

Objective: Allow users to choose their desired city easily.

Design Element: Scroll down page of cities with images giving the list of all registered cities on the website from where the user choose the desired one.

3.2.3. Location Selection:

Objective: Narrow down options by selecting a location within the chosen city.

Design Element: Display a map interface or a list of locations that dynamically updates based on the selected city.

3.2.4. Service Provider Selection:

Objective: Present a list of service providers in the selected location.

Design Element: Utilize visually appealing cards with provider information and an option to view available time slots.

3.2.5. Time Slot Selection:

Objective: Allow users to choose a preferred time slot.

Design Element: Input a start time to display available slots for the selected service provider.

3.2.6. User Authentication:

Objective: Securely authenticate users before confirming bookings.

Design Element: Offer multiple authentication options such as traditional email/password, OTP verification, and Google login. Clearly communicate the benefits of creating an account.

3.2.7. Slot Confirmation:

Objective: Confirm user selections before proceeding to payment.

Design Element: Present a summary of the chosen city, location, service provider, and time slot. Include a "Confirm" button leading to the payment gateway.

3.2.8. Payment Processing:

Objective: Facilitate secure and seamless payment transactions.

Design Element: Integrate the Stripe payment gateway with a simple and intuitive payment form. Clearly communicate the total cost and payment details.

3.2.9. Booking Confirmation:

Objective: Provide users with a confirmation of their booking.

Design Element: Display a confirmation receipt with a unique booking ID, reservation details, and an option to view the booking receipt.

3.3 Admin Flow:

3.3.1. Admin Login:

Objective: Authenticate admins securely.

Design Element: Implement a robust login page with two-factor authentication for added security.

3.3.2. City, Location, and Service Provider Management:

Objective: Empower admins to manage geographical and service-related information.

Design Element: Create a dashboard with forms for adding or removing cities, locations, and service providers. Include validation checks for data accuracy.

3.3.3. Database Update:

Objective: Ensure real-time updates to the database.

Design Element: Implement backend processes that synchronize the database with changes made by admins.

3.4. Security Flow:

3.4.1. Security Login:

Objective: Allow security personnel to access slot management features securely.

Design Element: Provide a separate login portal for security personnel with restricted access to slot-related functionalities.

3.4.2. Slot Availability Check:

Objective: Enable service providers and security personnel to view slot availability.

Design Element: Create a dashboard displaying a real-time grid of slots for each hour, indicating availability.

3.4.3. Offline Slot Allocation:

Objective: Allow security personnel to make immediate adjustments to slot availability.

Design Element: Implement an interface where security personnel can block or unblock slots based on on-site conditions, with changes reflected instantly in the database.

3.3.4. Database Update:

Objective: Ensure seamless synchronization with the database.

Design Element: Implement backend processes to update the database in real-time when security personnel make changes to slot availability.

CHAPTER 4

RESULT ANALYSIS AND VALIDATION

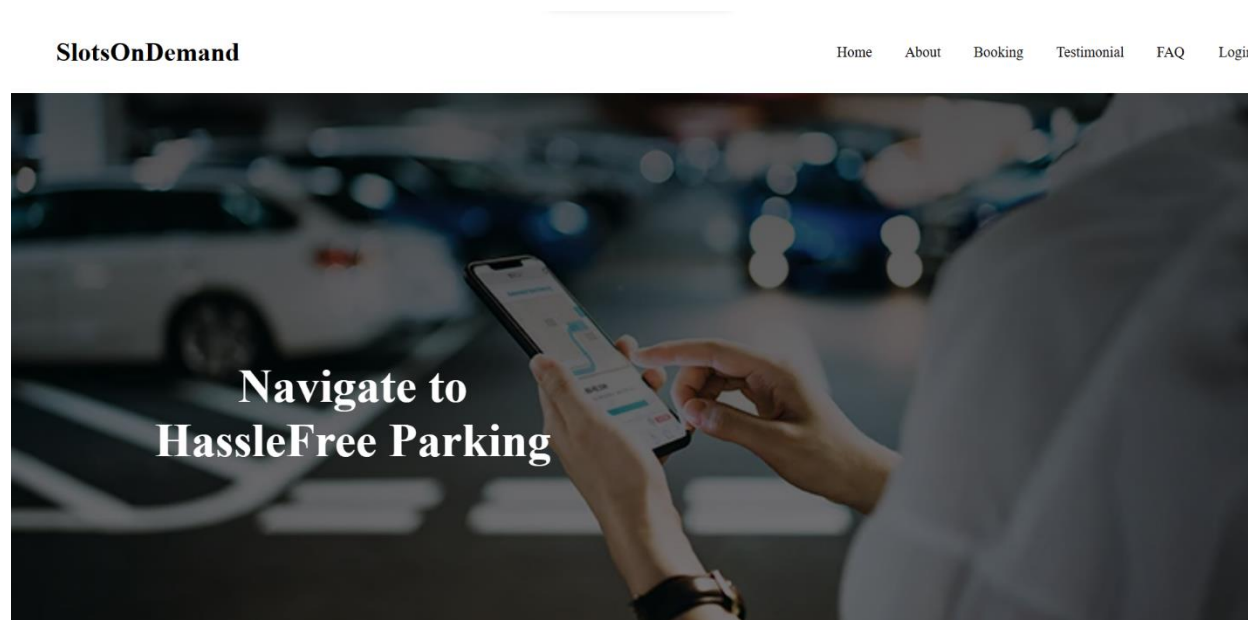


Figure 4.1 : Home Page

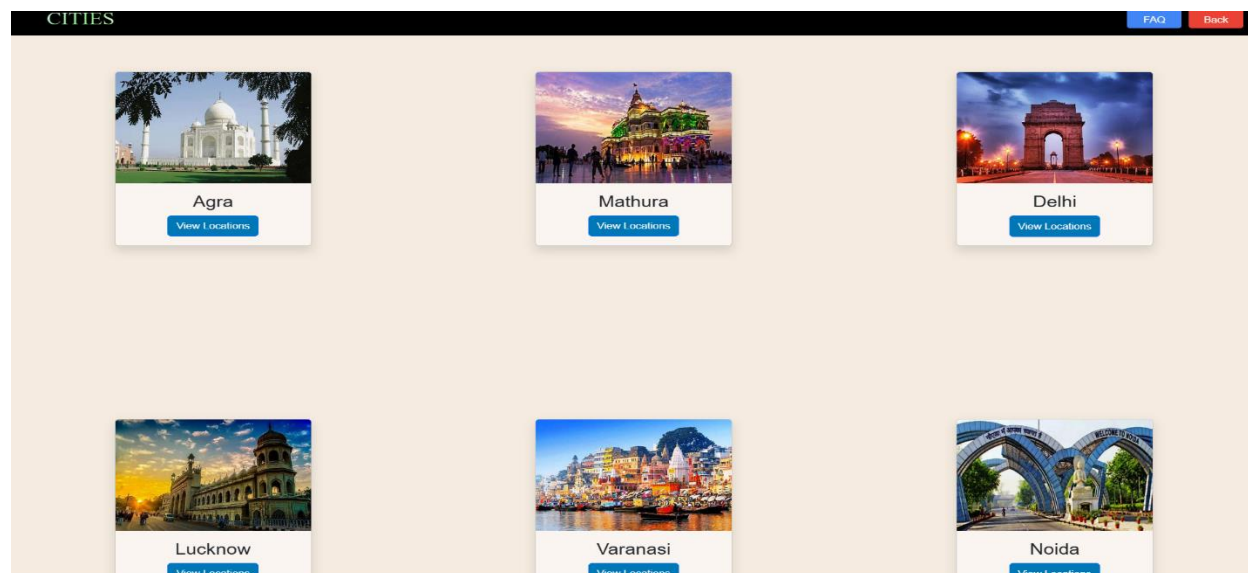


Figure 4.2 : Booking Page

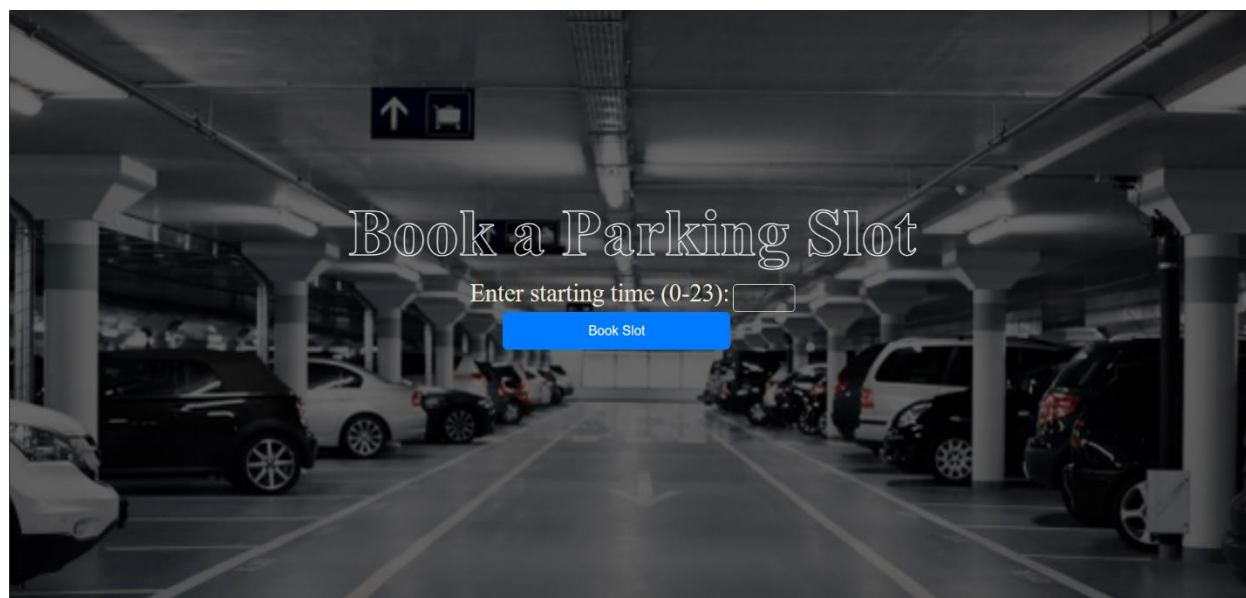




Figure 4.3 : Checking Available Slots


TEST MODE

Car Parking Slot Booking

₹30.00

Book a parking slot for your vehicle!!





Scan to book

Pay with card

Email

Card information


1234 1234 1234 1234 

MM / YY CVC 

Cardholder name

Full name on card

Country or region

India 

Book for ₹30.00

Powered by **stripe** | [Terms](#) | [Privacy](#)

Figure 4.4 : Payment page

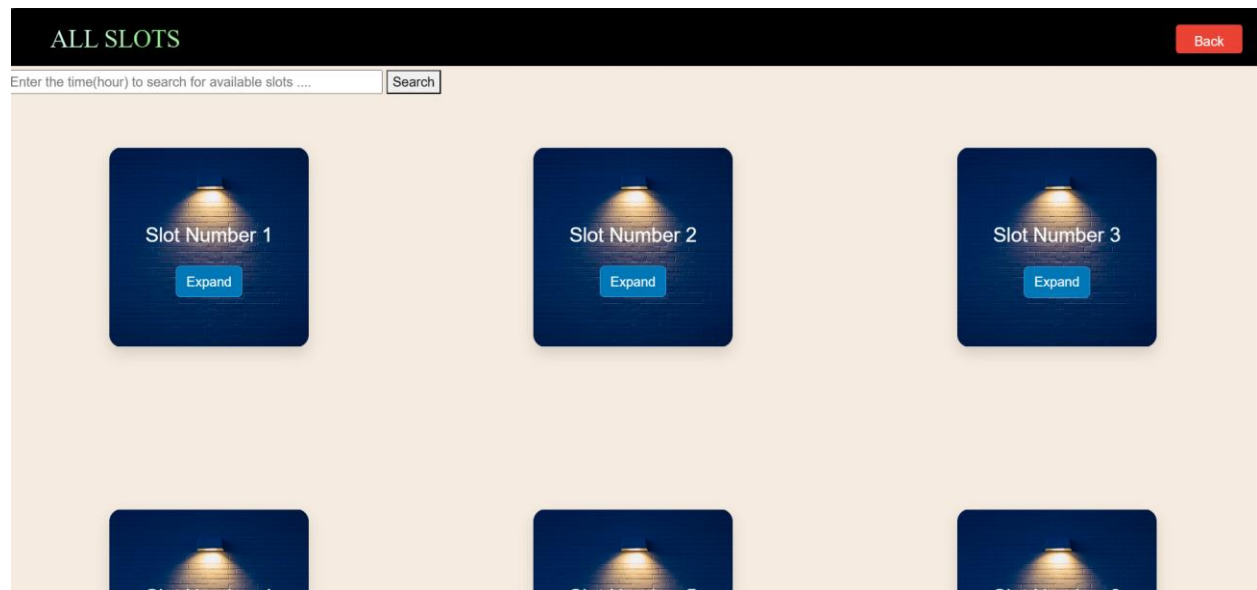


Figure 4.5 : Service Provider Page

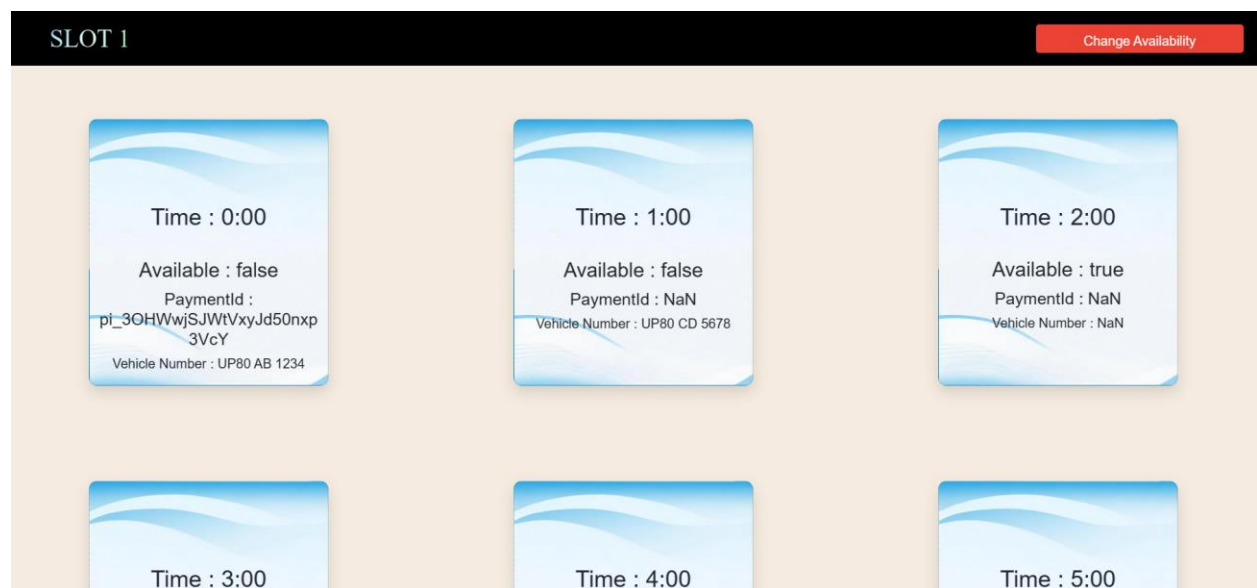


Figure 4.6 : Details of Each Slot

CHAPTER 5

CONCLUSION AND FUTURE WORK

5.1 Conclusion:

The successful creation and implementation of our Car Parking Slot Booking Platform mark a significant milestone in providing users with a seamless and efficient solution for online parking reservations. The platform's architecture, user-centric features, and robust administrative capabilities contribute to its success.

Key Achievements:

User-Friendly Booking Process:

The platform offers a straightforward booking process, allowing users to select their city, location, and service provider effortlessly.

Integration with Firebase facilitates secure user authentication, with options for email/password, OTP, and Google login.

Precision in Slot Allocation:

Dividing each slot into 24 hours ensures precise booking, optimizing the utilization of parking spaces.

Real-time availability checks from the MongoDB database provide users with accurate slot information before confirming bookings.

Secure Payment Processing:

Integration with the Stripe payment gateway ensures secure and smooth transactions, enhancing user trust and satisfaction.

Vehicle number and payment intent ID association after payment completion streamlines the booking process.

Administrative Control and Onboarding:

The admin panel empowers administrators to efficiently manage cities, locations, and service providers.

Automated generation of service provider credentials simplifies onboarding, ensuring secure access for each provider.

Security Measures and Flexibility:

Security logins for service providers enable them to manage their slots securely with the credentials provided by the admin.

Security personnel can dynamically check and adjust slot availability, providing flexibility for offline slot allocation.

Technological Stack:

Leveraging MongoDB, Firebase, Stripe, ngrok, JavaScript, EJS, HTML, CSS, and various APIs contributes to a versatile and resilient platform.

5.2 Future Aspects:

As we look ahead, there are several avenues for future development and enhancement of the Car Parking Slot Booking Platform:

Enhanced User Experience:

Further refine the user interface and experience based on ongoing user feedback and emerging design trends.

Predictive Analytics and Notifications:

Implement predictive analytics to anticipate peak booking times and provide users with proactive notifications.

Integration of Emerging Technologies:

Explore the integration of emerging technologies such as IoT for real-time monitoring and AI for predictive analytics.

Geographical Expansion:

Consider expanding the platform to cover additional cities and regions, broadening its user base.

Enhanced Security Measures:

Regularly conduct security audits to identify and address potential vulnerabilities, ensuring the platform's resilience.

Mobile Application Development:

Develop a dedicated mobile application to provide users with a more convenient and on-the-go booking experience.

Community Engagement:

Foster a sense of community among users through features such as forums, user-generated content, and loyalty programs.

Environmental Sustainability Initiatives:

Explore incorporating features that promote environmentally sustainable practices, aligning with green parking initiatives.

Continuous Monitoring and Performance Optimization:

Implement continuous monitoring tools to analyse performance data and optimize system efficiency.

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