EASYPARK A PARKING WEBSITE

A PROJECT REPORT for Mini Project-I (K24MCA18P) Session(2024-25)

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Under the Supervision of Ms. Divya Singhal Assistant Professor

Submitted to

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CERTIFICATE

Certified that **Rishi Nehra 202410116100167, Ravi Kant Tiwari 202410116100164, Prince Yadav 202410116100150** have carried out the project work having "**Easy Park A Parking Website**" (**Mini Project-I, K24MCA18P**) for **Master of Computer Application** from Dr. A.P.J. Abdul Kalam Technical University (AKTU) (formerly UPTU), Lucknow under my supervision. The project report embodies original work, and studies are carried out by the student himself/herself and the contents of the project report do not form the basis for the award of any other degree to the candidate or to anybody else from this or any other University/Institution.

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ABSTRACT

Easy Park website is a comprehensive online platform designed to provide utility services to the people. The system offers a user-friendly interface to the users to book a parking for their vehicle very easily. This project aims to reduce the struggles for people travelling to the new locations and facing problems where to park their vehicles.

Key features of the system include a robust User Management Module that handles user registration, login, profile management.

The Search and Filter Module helps users find products efficiently by searching and filtering based on attributes like category, price, and ratings. The Review and Rating Module empowers customers to provide feedback, while admins can manage and moderate reviews to maintain quality and trust.

By leveraging modern web technologies, the website is optimized for performance, security, and scalability. It uses encryption techniques to ensure data privacy and incorporates a responsive design to provide an accessible experience across different devices. The system aims to offer a high level of customer satisfaction. Overall, the parking website serves as an ideal solution to the people looking to find the parking spots near them for free.

ACKNOWLEDGEMENTS

Success in life is never attained single-handedly. My deepest gratitude goes to my project supervisor, **Ms. Divya Singhal** for her guidance, help, and encouragement throughout my project work. Their enlightening ideas, comments, and suggestions.

Words are not enough to express my gratitude to **Dr. Arun Kumar Tripathi,** Professor and Dean, Department of Computer Applications, for his insightful comments and administrative help on various occasions.

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Finally, my sincere thanks go to my family members and all those who have directly and indirectly provided me with moral support and other kind of help. Without their support, completion of this work would not have been possible in time. They keep my life filled with enjoyment and happiness.

Rishi Nehra

Prince Yadav

Ravi Kant Tiwari

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CHAPTER 1

Project Description: Smart Parking Finder Website

The **Easy Park website** is a web-based application designed to simplify the process of finding and booking parking spaces. Users can input their location, and the website will provide a list of nearby parking spots. If the parking facility offers online booking, the website allows users to reserve their spots directly.

Key Features:

1. **Location-Based Search**: Users can search for parking spots near their current or specified location.

2. **Booking Integration**: Real-time booking functionality for parking spots with online reservation systems.

3. **Interactive Map**: Displays parking locations on an interactive map for easy navigation.

4. **Parking Details**: Includes features such as pricing, availability, and facilities for each parking spot.

Technologies Used:

- **Frontend**: HTML, CSS, JavaScript
- **Backend**: Node.js for handling user data and integrating booking APIs.
- **Database**: MongoDB for storing parking spot information.
- **APIs**: Google Maps API is used for fetching the parking locations This project addresses urban parking challenges by providing a user-friendly solution for locating and reserving parking spots, enhancing convenience and reducing time spent searching for parking.

CHAPTER 2

Project Scope: Easy Park Website

The scope of the EasyPark project defines the boundaries, objectives, and deliverables to ensure the website meets user expectations and requirements.

In-Scope Features:

1. User Location Input:

   Allow users to input their location manually or detect their location using GPS.

2. Search for Parking Spots:

   Provide a list of available parking spots near the user's specified location.

3. Interactive Map:

   Display parking spots on an interactive map with additional details like distance, availability, and amenities.

4. Parking Details:

   Include relevant information for each parking spot, such as price, operating hours, and contact details.

5. Booking Facility:

   Enable users to book parking spots in real-time where online booking is supported.

6. User-Friendly Interface:

   Create an intuitive and responsive user interface accessible across devices.

7. Data Integration:

   Integrate third-party APIs (e.g., Google Maps) for location and route mapping.

8. Database Management:

   Maintain a database to store parking spot information, availability, and booking records securely.

Out-of-Scope Features:

1. Real-time monitoring of parking lot occupancy via IoT or hardware integration.
2. Payment gateway integration for handling booking payments.
3. Support for long-term parking subscriptions or corporate accounts.
4. Features for parking lot owners to manage their facilities. Assumptions:

1. Users have internet connectivity for accessing the website.
2. Parking spots with online booking capabilities provide APIs for integration.
3. The project is limited to a specific geographic area initially, with potential for future expansion.

Deliverables:

1. A fully functional website allowing users to find and book parking spots.
2. A database containing parking location details and availability.
3. Integration with location-based APIs for accurate navigation. **4.** Documentation covering user guides and system architecture.

By adhering to this scope, the project aims to deliver a reliable, user-centric solution to simplify parking spot discovery and booking.

Chapter 3

Feasibility Study: Smart Parking Finder Website

The purpose of this feasibility study is to evaluate the practicality of developing a web-based application that allows users to locate nearby parking spots and book them, if available.

1. Technical Feasibility Technology

Stack

- **Frontend:** HTML, CSS, JavaScript frameworks
- **Backend:** Node.js, Express.js.
- **Database:** MongoDB for structured data management.
- **APIs:** Google Maps API for geolocation and mapping services.

Challenges and Solutions

1. **Integration of Real-Time Data:**
   - *Challenge:* Synchronizing data for parking availability.
   - *Solution:* Partner with parking providers who offer APIs or manual updates.
2. **Responsive Design:**
   - *Challenge:* Ensuring compatibility across various devices.
   - *Solution:* Use a mobile-first approach in the design process.
3. **High Traffic Management:**
   - *Challenge:* Scalability during peak usage times.
   - *Solution:* Use scalable cloud infrastructure with load balancing.

The required technology stack and resources are widely available. This makes the project technically feasible with proper planning and execution.

2. Operational Feasibility

Operational Goals

- Simplify the process of finding parking spots.

- Provide real-time booking options for user convenience.

Key Features for Users

1. Location detection via GPS or manual input.
2. Display of nearby parking spots with availability status.
3. Ability to book parking spots directly on the platform.

Support and Maintenance

- Regular updates to parking spot data and features.
- Technical support to address user queries and resolve issues.

The system aligns with user expectations, and operations can be streamlined through partnerships with parking providers and automated updates.

3. Economic Feasibility

The My Shop eCommerce is economically feasible due to its cost-effective process development and operational structure. The use of open-source technologies reduce initial development costs, while cloud-based hosting ensures scalability without the significant infrastructure investment. Additionally, the platform's potential to make revenue through product sales, advertising, and subscription models provides a good financial outlook, ensuring long-term profitability and sustainability.

Conclusion:

The project is economically viable, with manageable costs and multiple revenue streams.

4. Legal Feasibility

Legal Requirements

1. **Data Privacy and Security:**
    - Adherence to GDPR and similar regulations for user data protection.
    - Use of encrypted databases to store sensitive data.
2. **API Usage:**
    - Comply with the terms of third-party services like Google Maps API.
3. **Partnership Contracts:**
    - Draft agreements with parking providers for data sharing and revenue sharing.

Potential Risks

- Liability for incorrect parking information.
- Legal action for data breaches or misuse.

By following established legal guidelines and securing contracts with partners, the project's legal risks can be minimized.

5. Market Feasibility Market Analysis

1. Increasing urbanization is creating a high demand for efficient parking solutions.
2. Existing platforms like SpotHero or ParkWhiz indicate a viable market, but local adaptations can provide a competitive edge.

Unique Selling Proposition (USP):

- Integration of real-time booking functionality with user-friendly design.
- Focus on underserved areas and cities.

User Segments

- Daily commuters in urban areas.
- Tourists and event attendees.
- Delivery drivers and logistics personnel.

The market is ripe for a solution like this, with ample opportunities to carve out a niche by targeting specific user needs.

Overall Feasibility Conclusion

The **Easy Park** website is a technically, operationally, economically, legally, and market-feasible project. With proper execution, it has the potential to become a widely adopted solution for parking challenges in urban areas, benefiting users and parking providers alike.

Chapter 4

PROJECT OBJECTIVE

Detailed Project Objectives: Easy Park Website

1. **Simplify the Parking Spot Discovery Process** ○ Build a web application that allows users to easily search for nearby parking spots based on their current location or a specified address. ○ Implement geolocation technology to automatically detect the user's location and provide tailored results without manual input.
   ○ Offer intuitive filters such as price range, availability, distance, and amenities to streamline the search process.
2. **Enable Real-Time Parking Spot Booking** ○ Integrate a robust booking system for parking spots that support online reservations. ○ Provide users with a seamless booking experience, including options to select time slots and confirm reservations. ○ Notify users of successful bookings via confirmation messages or emails, ensuring reliability and trust.
3. **Deliver Comprehensive Parking Spot Information** ○ Include detailed data for each parking spot, such as pricing, operating hours, availability, accessibility features, and amenities.
   ○ Use an intuitive interface to display this information in an organized format, enabling informed decision-making by users.
4. **Enhance User Experience Across Devices** ○ Design a responsive and user-friendly interface that ensures seamless functionality across desktops, tablets, and smartphones. ○ Implement a simple and visually appealing user interface with minimal steps required for search, selection, and booking.
   ○ Incorporate an interactive map view for easy visualization of parking locations and routes.

5. **Leverage Geolocation and Mapping Technology**
   - Integrate Google Maps API (or similar) for precise mapping of parking spots and route navigation.
   - Allow users to view parking locations relative to key landmarks or their destination for better convenience.
6. **Promote Sustainability and Efficiency**
   - Reduce the time and fuel wasted in searching for parking spots, contributing to lower traffic congestion and carbon emissions.
   - Encourage eco-friendly practices by partnering with facilities that offer electric vehicle (EV) charging stations.
7. **Facilitate Collaboration with Parking Providers**
   - Develop partnerships with parking lot owners and providers to maintain up-to-date information about spot availability and pricing.
   - Enable providers to integrate their booking systems or manually update availability through a secure dashboard.
8. **Ensure Data Privacy and Security**
   - Comply with data protection regulations such as GDPR to safeguard user information.
   - Use secure encryption for sensitive data, including user accounts and booking details, to build trust and reliability.
9. **Scalability for Regional and Global Expansion**
   - Design the platform with scalability in mind, allowing for the addition of new cities, regions, or countries over time.
   - Incorporate multi-language support to cater to diverse user demographics.
10. **Establish a Sustainable Revenue Model**
    - Generate income through multiple revenue streams, including:
      - Subscription fees from parking providers for listing their spots.
      - Commissions on each successful booking made via the platform.
      - Location-based advertisements from nearby businesses.

- Ensure competitive pricing for users while maintaining profitability for the platform.

11. **Foster Community Feedback and Engagement** ○ Include a feature for user reviews and ratings of parking spots to improve transparency and user satisfaction. ○ Actively gather user feedback to continuously improve platform features and address pain points.

12. **Build a Scalable Technical Foundation** ○ Utilize cloud-based hosting and scalable architecture to handle increasing user traffic and data as the platform grows. ○ Regularly update the platform to integrate new technologies, optimize performance, and maintain reliability.

These objectives ensure that the **Easy Park website** delivers a comprehensive solution to parking challenges, meets user expectations, and evolves to address future needs and opportunities.

Chapter 5

Hardware and Software Requirement

To ensure the e-commerce website operates efficiently and securely, the following hardware requirements are recommended:

Web Server

- Processor: Minimum 4-core CPU (e.g., Intel Xeon or AMD Ryzen)
- RAM: At least 16 GB
- Storage: SSD with a minimum of 500 GB for faster data access and retrieval
- Network: High-speed internet connection (minimum 100 Mbps) **Database Server**
- Processor: Minimum 4-core CPU
- RAM: At least 16 GB
- Storage: SSD with at least 500 GB, with scalability options as data needs grow

Security Hardware

- Firewall: To protect against unauthorized access
- Intrusion Detection System (IDS): For monitoring and identifying potential threats

To build and maintain an effective e-commerce website, the following software requirements are essential:

Operating System

- Web Server: Linux (e.g., Ubuntu, CentOS) or Windows Server for hosting
- Development Environment: Cross-platform compatibility (Windows,
- macOS, Linux)

Database Management System

- MySQL, PostgreSQL, or MongoDB: For data storage and management

Programming Languages and Frameworks

- Frontend:
    - HTML, CSS, JavaScript
    - Frameworks like React, Angular, or Vue.js for interactive user interfaces
- Backend:
    - Languages such as PHP, Python (Django or Flask), or Java (Spring)

Development Tools

- Integrated Development Environment (IDE): Such as Visual Studio Code, – Popstar, or Eclipse

Chapter 6 Project Flow

1. **User Access and Authentication**

   - **1.1 Website Landing Page:**
     - Users land on the homepage of the website, which introduces the service and provides navigation options.
   - **1.2 Optional Login/Signup:**
     - Users can log in or sign up for an account to access personalized features like saved locations, booking history, and notifications. ○ Guest users can proceed without an account but with limited functionality.

2. **Location Input and Detection**

   - **2.1 Manual Location Entry:** ○ Users enter their desired location in a search bar (e.g., street address, landmark, or city).
   - **2.2 GPS-Based Location Detection:**
     - Users can opt to detect their current location automatically using GPS.
   - **2.3 Location Confirmation:** ○ The system confirms the detected or entered location by displaying it on a map and allowing the user to refine it if needed.

3. **Parking Spot Search**

   - **3.1 Display Nearby Parking Spots:**
     - The system fetches data on parking spots near the user's specified location, using a radiusbased search (e.g., within 2 km).
   - **3.2 Filter and Sort Options:**
     - Users can refine their search with filters such as:

       Price range

       Availability status (real-time data if available)

       Amenities (e.g., EV charging, covered parking)

Distance from location

- **3.3 Map and List View:**
  - Parking spots are displayed in both a list format and an interactive map.

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4. **Parking Spot Selection**
   - **4.1 Viewing Parking Details:**
     - Users can click on a parking spot to view its details, including:

       Price per hour or fixed rate

       Availability (real-time or estimated) Operating hours

       Reviews and ratings from other users
   - **4.2 Booking Eligibility Check:**
     - The system checks if the selected spot supports online booking.

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5. **Parking Spot Booking (If Applicable)**
   - **5.1 Selecting Time Slot:** Users choose the date and time for parking, including start and end times.
   - **5.2 Availability Check:** The system checks real-time availability for the selected time slot.
   - **5.3 Booking Confirmation:**
     - Users confirm their booking and receive a summary, including:

       Booking reference number

       Spot details and location

       Payment (if applicable)
   - **5.4 Payment Gateway Integration (Optional):**

- If the parking provider supports payments, users can make payments online securely.

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6. **Booking and Navigation Assistance**

- **6.1 Booking Confirmation Page:**
  - The system displays a confirmation message with a QR code (if needed) or a digital ticket.
- **6.2 Directions to Parking Spot:**
  - Users receive navigation assistance via Google Maps or similar APIs to reach their booked parking spot.

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7. **Post-Parking User Engagement**

- **7.1 Feedback and Ratings:**
  - After using the parking spot, users are prompted to leave feedback and rate their experience.
- **7.2 Booking History:** - Logged-in users can view their past bookings, including details like time, location, and cost.
- **7.3 Notifications and Reminders:**
  - Users receive notifications for upcoming bookings and reminders to review past experiences.

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8. **Admin and Provider Interaction (Backend)**

- **8.1 Parking Provider Dashboard:**
  - Parking lot owners can update their listings, manage availability, and view booking requests.
- **8.2 Admin Panel:**
  - Website administrators monitor platform activity, resolve disputes, and manage provider accounts.

- **8.3 Data Synchronization:** ○ The system updates parking spot data in real-time, integrating with third-party APIs where available.

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9. **Error Handling and Support**
   - **9.1 Error Notifications:**
     ○ Users are notified in case of errors (e.g., location detection failure, unavailable booking slots).
   - **9.2 Help and Support:**
     ○ A support section with FAQs, chat support, or email assistance is available for resolving user issues.

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10. **Future Expansion Capabilities**
    - **10.1 Multi-City Support:** ○ The system can be expanded to include parking spots in additional cities and regions.
    - **10.2 Advanced Features:** ○ Future features such as dynamic pricing, IoT-based real-time occupancy detection, or loyalty programs can be added.

USE CASE DIAGRAM OF MYSHOP ECOMMERCE WEBSITE

Use Case Diagram Components

1. **Actors**

User: The primary actor using the system to find and book parking spots.

Parking Provider: Manages parking spot data and availability.

Admin: Oversees the platform and resolves issues.

2. **Use Cases**
   - **Find Parking Spots**: Locate parking spots near a specific location.
   - **Filter Parking Spots**: Refine search results based on filters like price, distance, and amenities.
   - **View Parking Spot Details**: View details of selected parking spots, such as price and availability.

Book Parking Spot: Reserve a parking spot if booking is supported. **Pay for Booking**: Make payments for reserved parking spots (if applicable).

Navigate Parking Spot: Get directions to the selected or booked parking spot.

Provide Feedback: Leave reviews and ratings for parking spots.

Manage Parking Listings: (For Parking Provider) Update parking spot information and availability.

   - **Resolve User Queries**: (For Admin) Assist users with issues related to bookings or payments.

Use Case Diagram Description

Actors and Interactions 1. **User**:

- Interacts with the use cases:

Find Parking Spots

Filter Parking Spots

View Parking Spot Details

Book Parking Spot

Pay for Booking

2. **Parking Provider**:
   Interacts withthe use cases
   Manage Parking Listings
3. **Admin**:

   Interacts with the use cases:

   Resolve User Queries

Visual Representation

I'll create a textual description here, but it can be visually drawn using tools like Lucidchart or Draw.io:

1. **Actors (Stick Figures)**: ○ Place three actors: "User," "Parking Provider," and "Admin."
2. **Use Cases (Ovals)**:
   ○ Arrange the use cases inside a system boundary box labeled "Smart Parking Finder Website."
3. **Connections (Lines)**: ○ Draw lines connecting actors to their respective use cases.

   ○ Example:

   "User" → "Find Parking Spots"

   "User" → "Book Parking Spot"

   "Parking Provider" → "Manage Parking Listings"

   "Admin" → "Resolve User Queries"

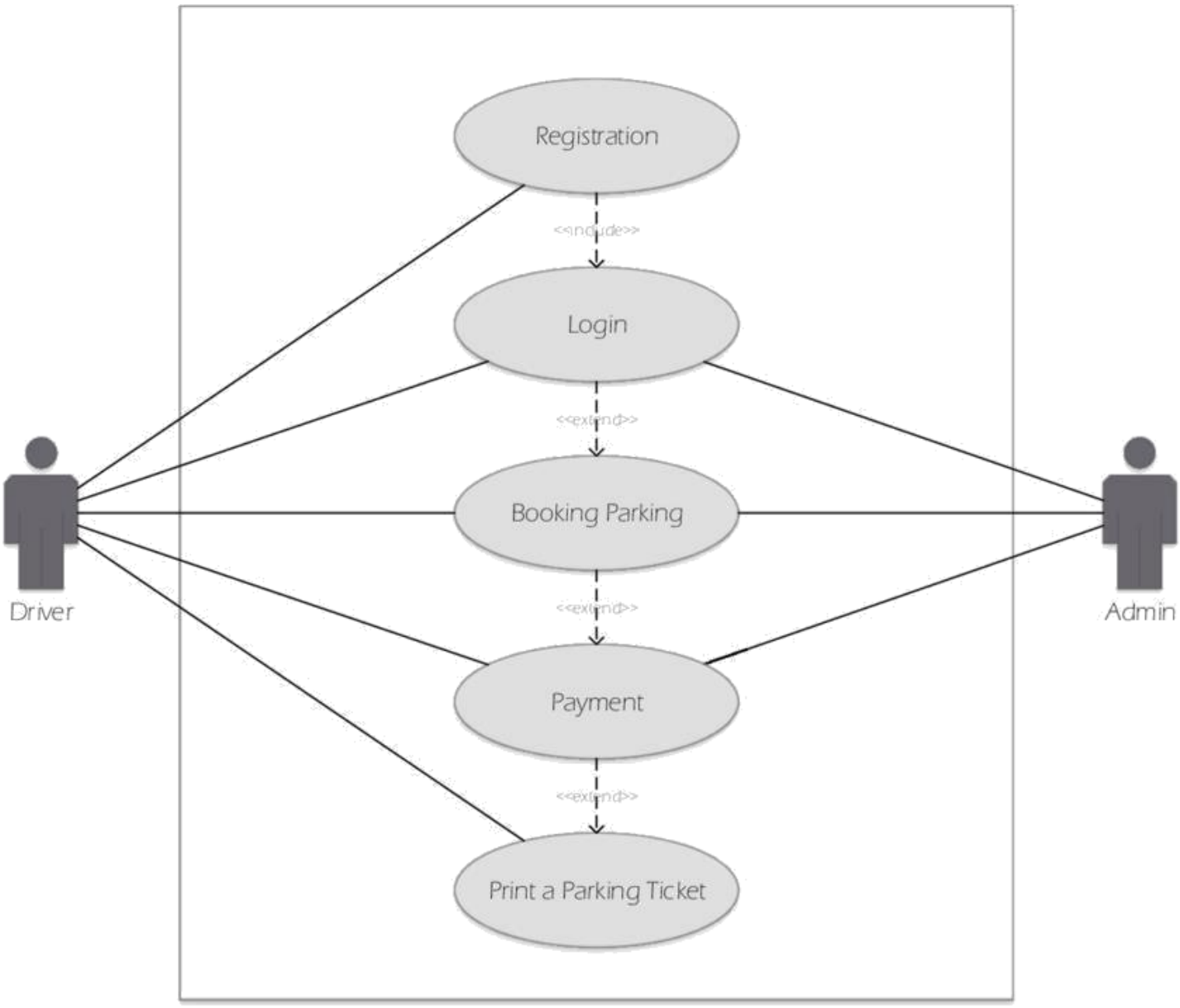
Registration
<<include>>
Login
<<extend>>
Booking Parking
<<extend>>
Payment
<<extend>>
Print a Parking Ticket
Driver
Admin

Fig 6.1

ER DIAGRAM OF MYSHOP ECOMMERCE WEBSITE

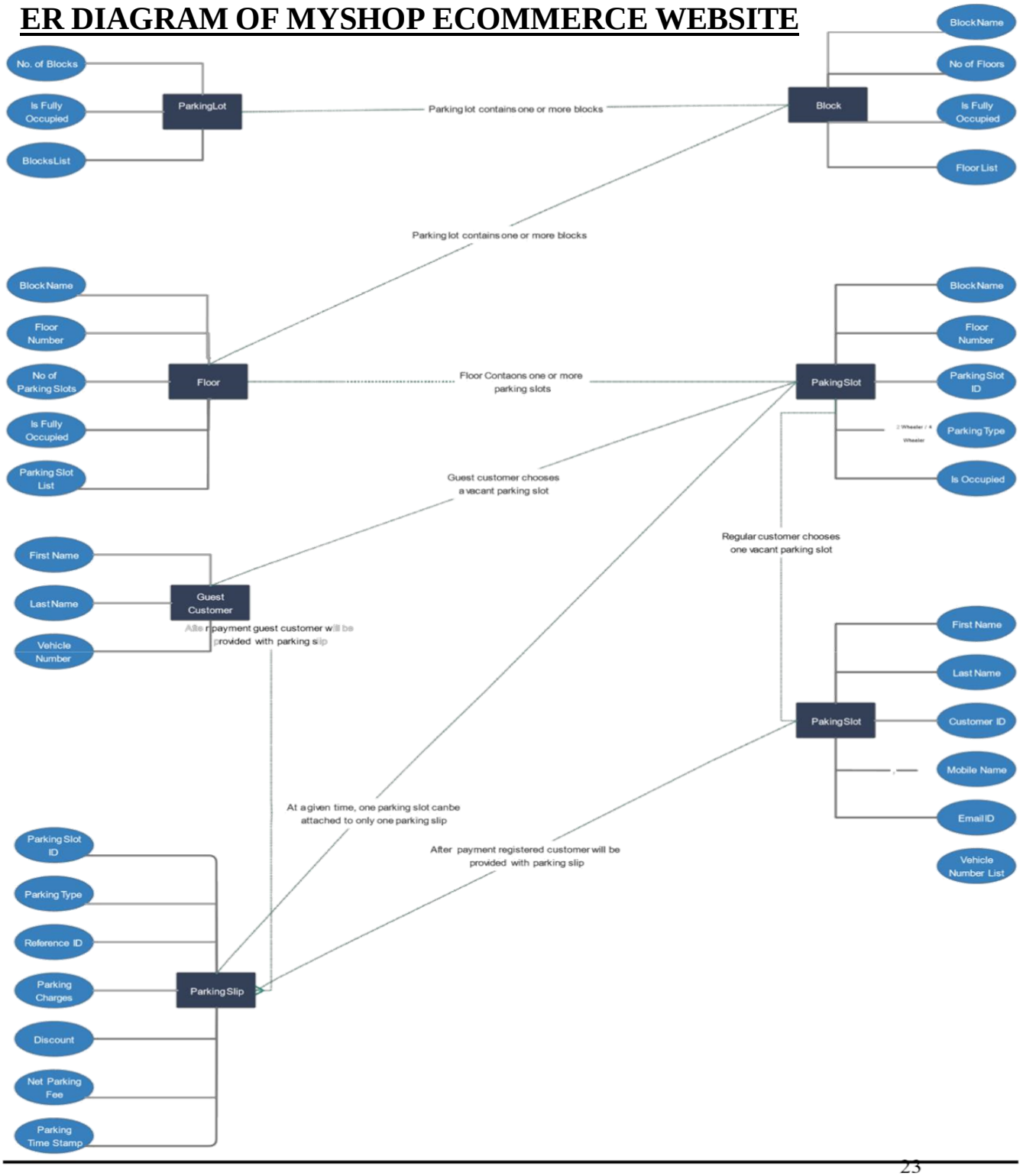

Fig 6.2

DATA FLOW DIAGRAM OF MYSHOP ECOMMERCE WEBSITE

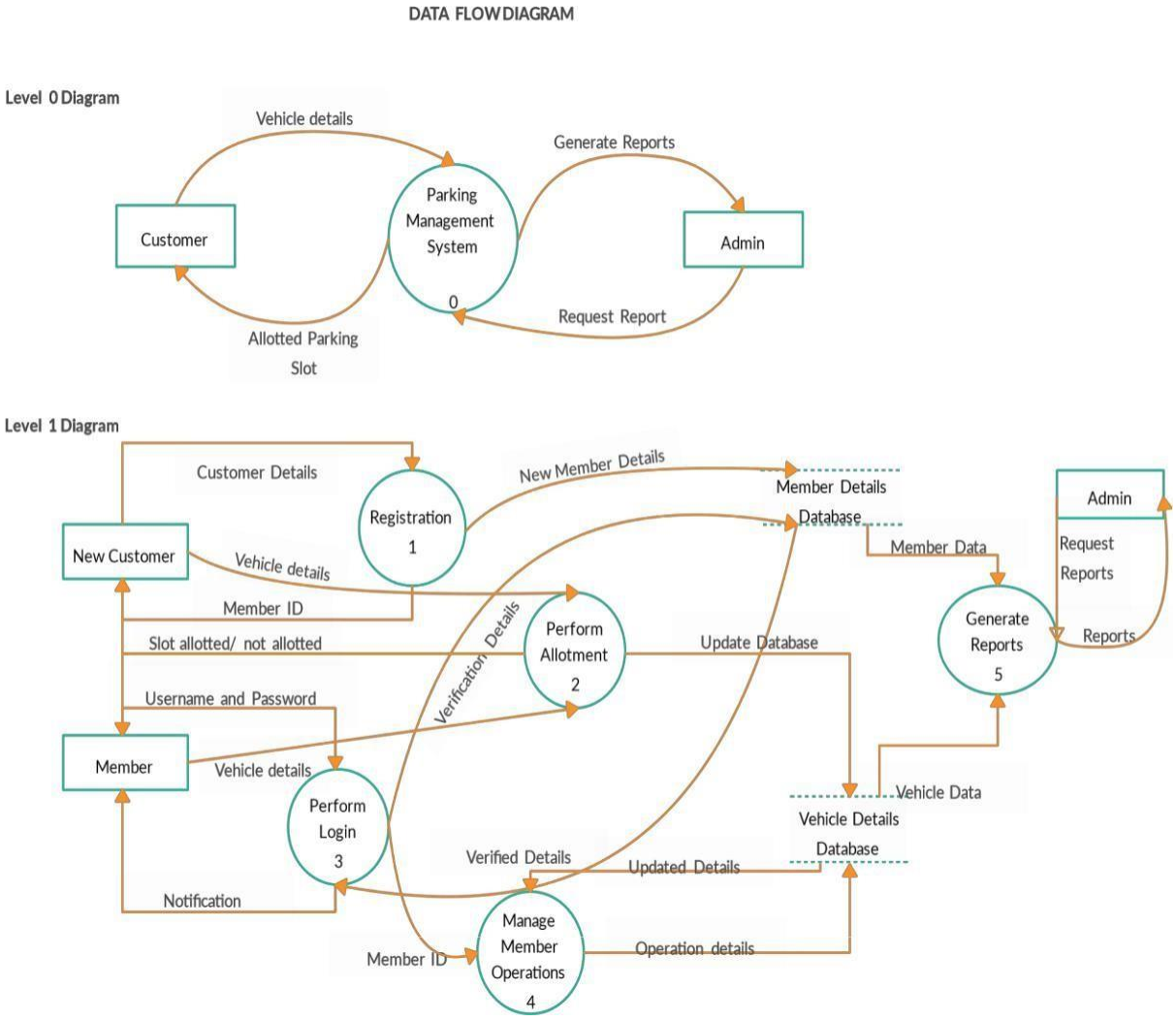

Fig 6.3

CHAPTER 7

PROJECT OUTCOME

Project Outcome: Parking Location Website

This project aims to develop a user-friendly web application that assists users in finding and booking parking spaces conveniently. The website will offer the following key functionalities:

1. Location-Based Parking Search:

- Users can input their current location or a desired destination.
- The system will retrieve a list of nearby parking locations, considering factors like distance and availability.
- The search results will be displayed with relevant details, including location name, address, price, and availability.

2. Real-time Availability and Booking:

- The website will display real-time parking availability information for each location.
- Users can book parking spots directly through the website, provided the desired time slot is available.
- The booking process will involve selecting a parking location, specifying the desired parking duration, and making payment.

3. User-Friendly Interface:

- The website will feature a clean and intuitive user interface, making it easy for users to navigate and interact with the system.
- The design will be responsive, ensuring a seamless

experience across various devices (desktops, tablets, and smartphones).

4. Secure and Reliable System:

The website will implement robust security measures to protect user data and ensure the integrity of transactions. ◦ The system will be designed for high availability and reliability, minimizing downtime and ensuring a smooth user experience.

5. Additional Features:

The website may offer additional features such as:

User account creation and management

Booking history and cancellation

Parking location ratings and reviews

Integration with navigation apps for directions to parking locations

Push notifications for booking confirmations and reminders

By successfully implementing these features, the project will deliver a valuable tool for users seeking convenient and hassle- free parking solutions. The website will streamline the parking experience, save users time and effort, and contribute to a more efficient and organized parking ecosystem.

HOME PAGE

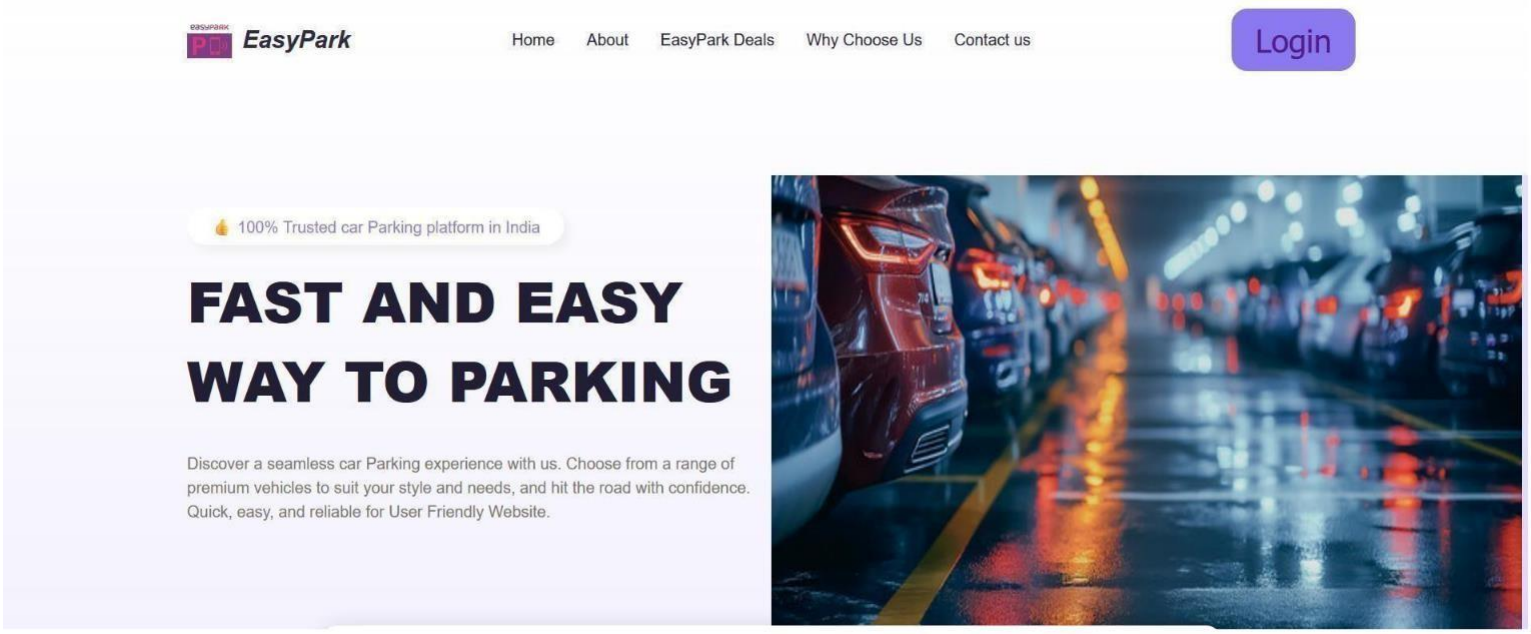

Fig 7.1

- The homepage serves as the primary interface, showcasing the platform's key features and Navbar.
- It includes an intuitive navigation menu for easy access to About, Contact us, log in and other sections.
- A welcoming banner highlights the platform's landing, promotions, or popular Products

FOOTER NAVBAR

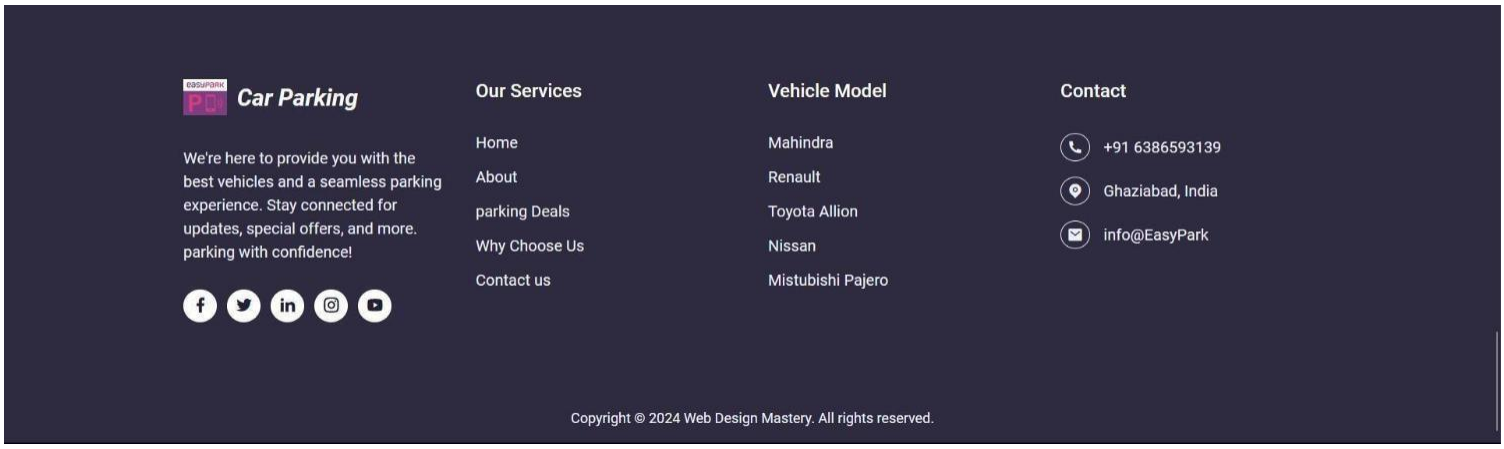

Fig 7.2

- A footer navbar which contains clicks to various important options for easy navigation and findings along with newsletter subscription.

SERIVCE SECTION

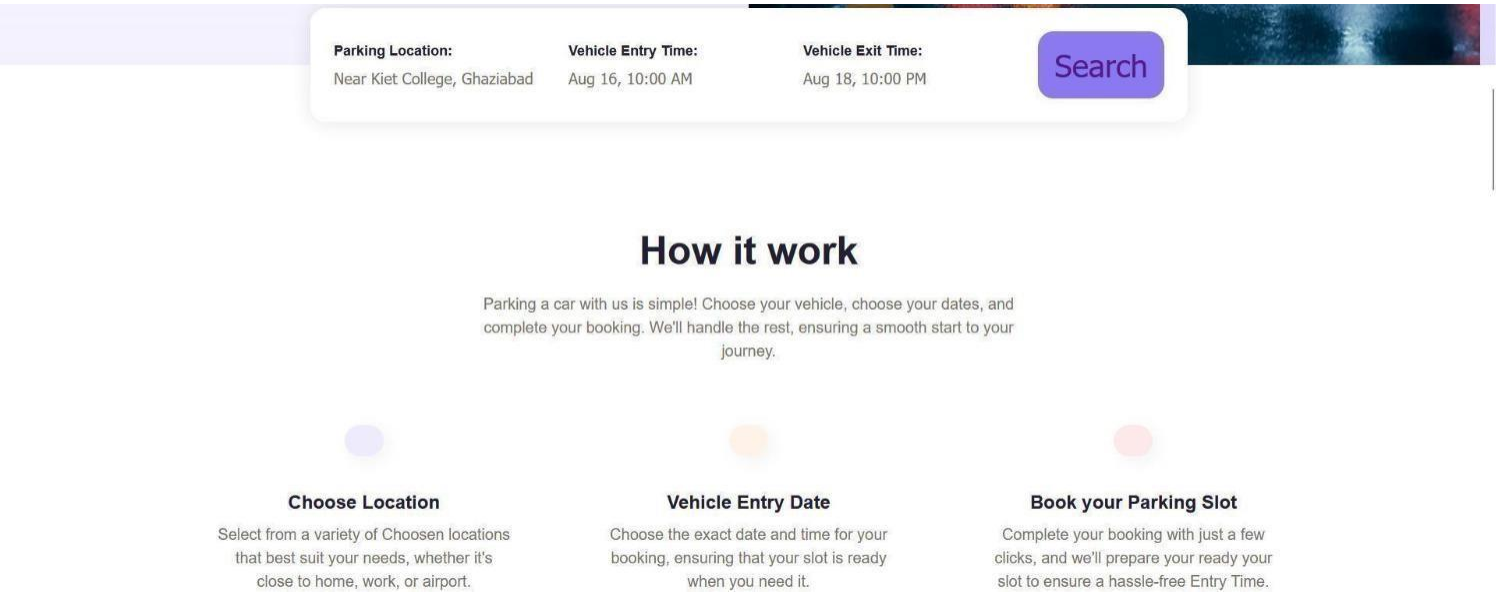

Fig 7.3

• Next is our service section which tells us about the working of our website

REVIEWS/ RATINGS PAGE

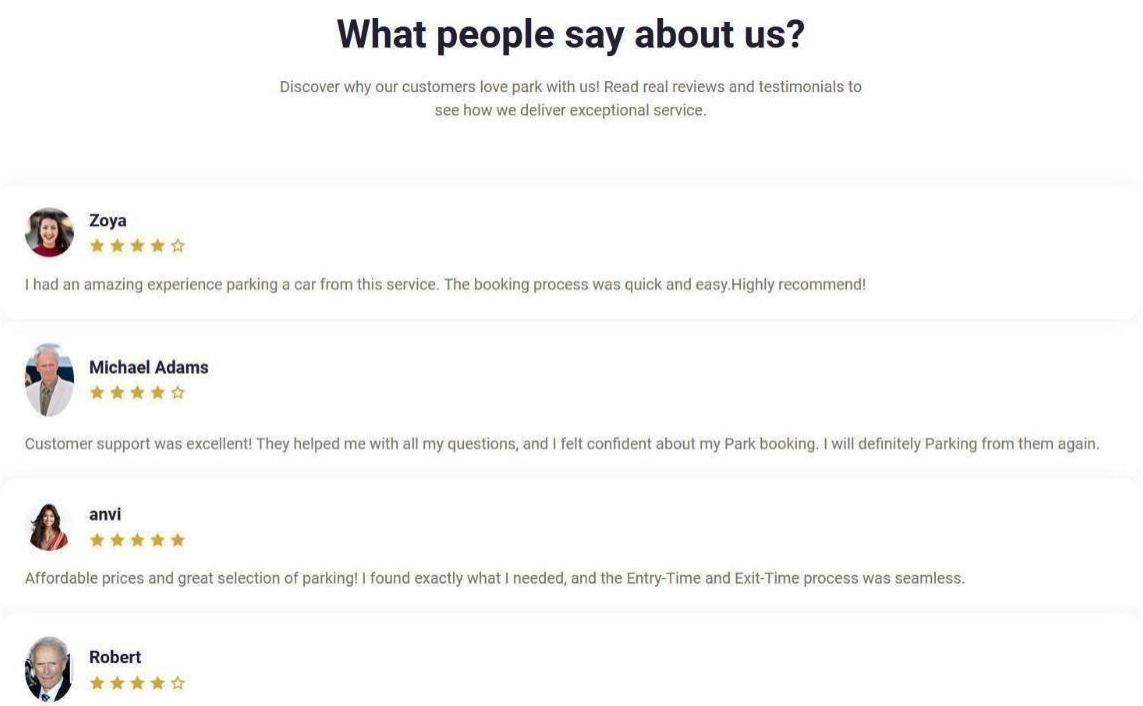

Fig 7.4

WHY CHOOSE US?

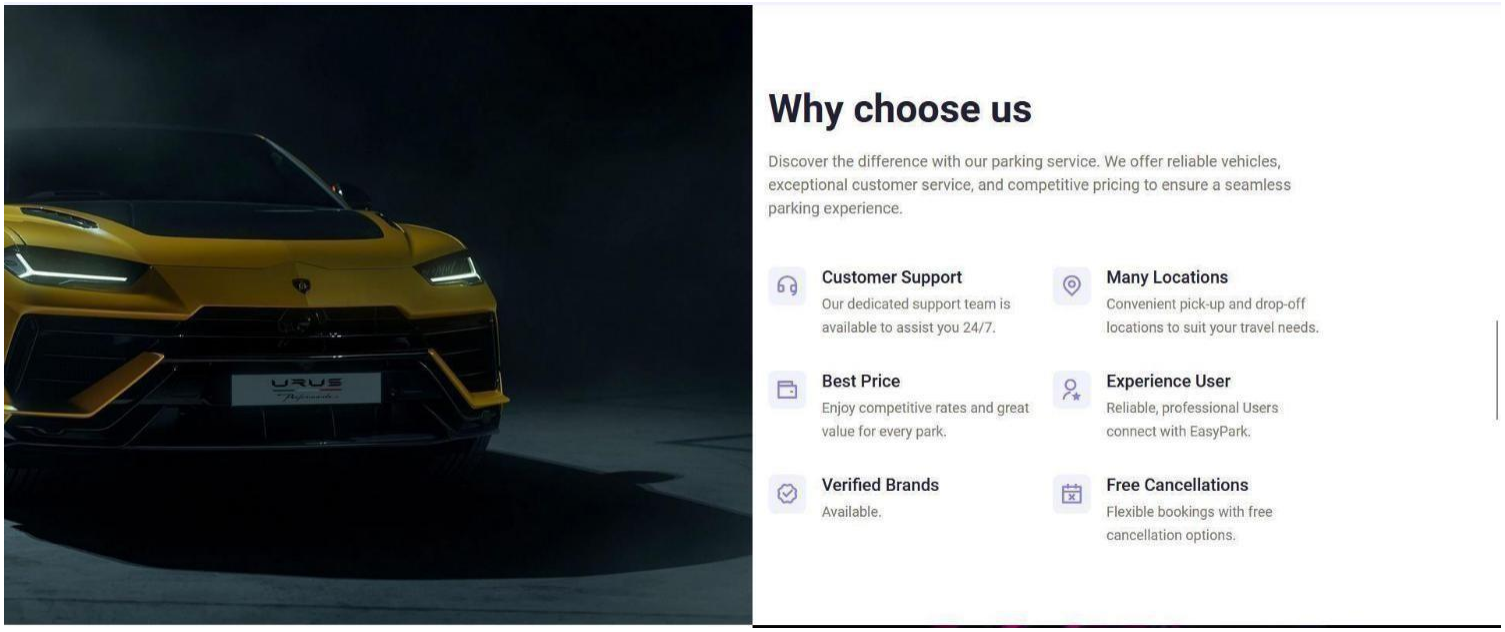

Fig 7.5

THIS SECTION JUST TELLS THE USERS ABOUT THE FEATURES OFFERED BY OUR WEBSITE AND WHY YOU SHOULD CHOOSE US

CATEGORY SECTION

- The product category page organizes products into specific categories for easier browsing and discovery. Users can filter and sort items based on attributes like price, ratings, and features. This streamlined layout helps users quickly find products that meet their needs within a particular category

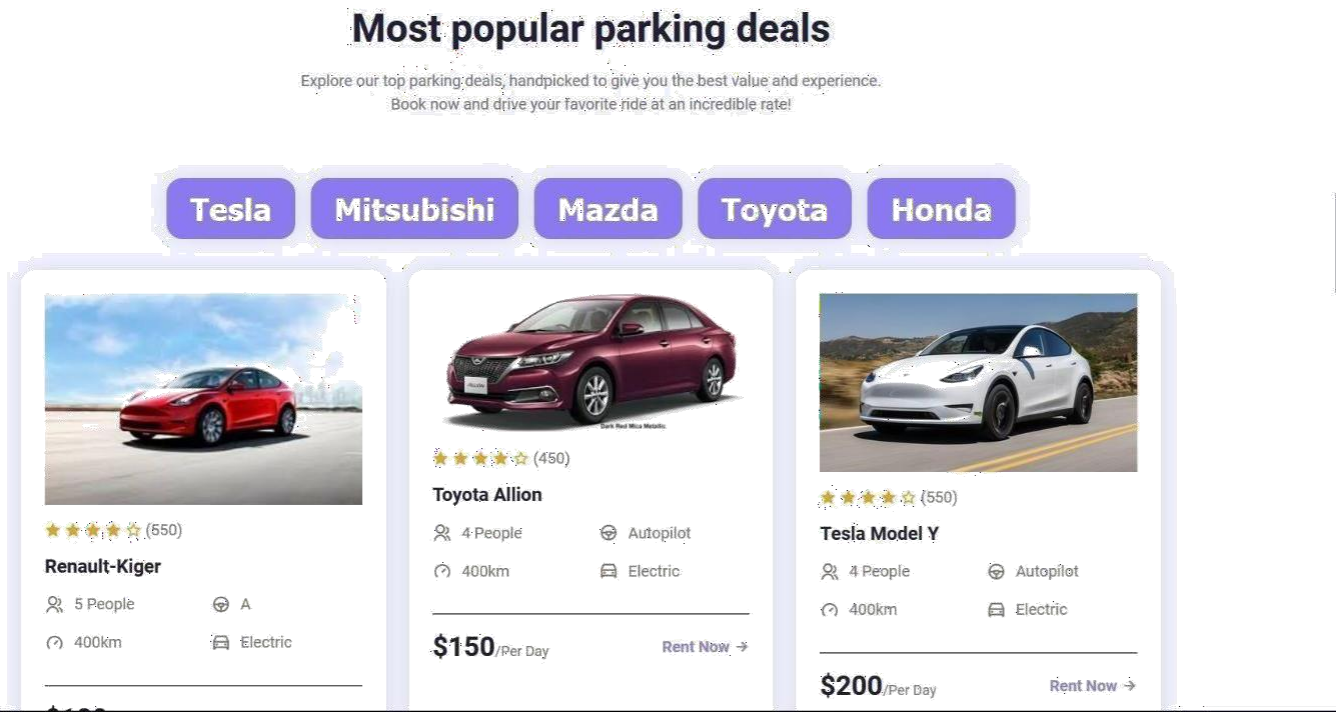

Fig 7.6

LOG IN PAGE

- Here user will enter the log in details or they will sign up if they are visiting the site for the first time

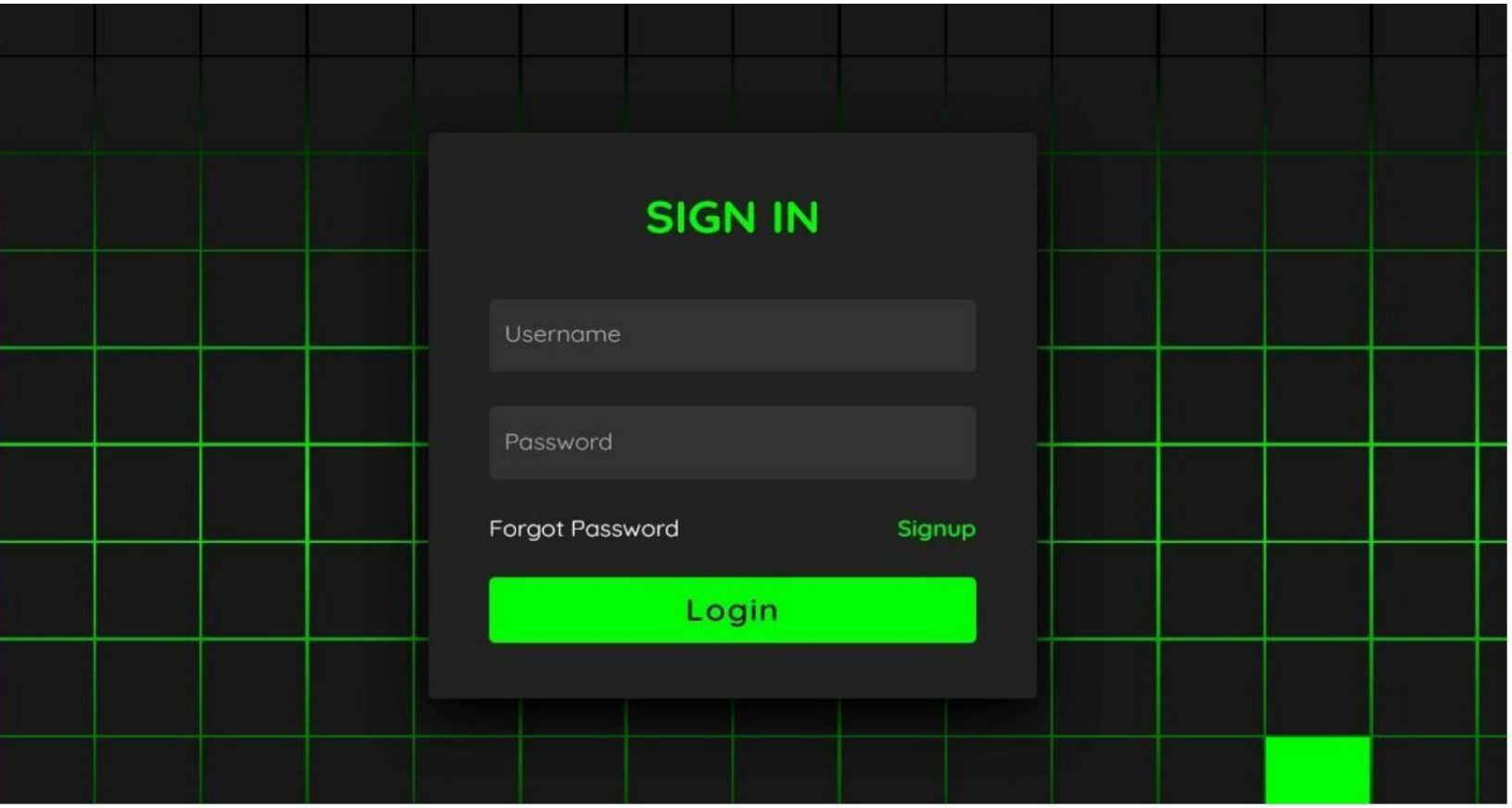

Fig 7.7

REFERENCES

- https://easyparkgroup.com/
- https://www.google.com/
- https://chatgpt.com/
- https://gemini.google.com/app
- https://developers.google.com/maps
- https://stackoverflow.com/