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ONLINE CAR RENTAL SYSTEM

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ABSTRACT

Traveling provides opportunities to explore new places, gain fresh perspectives, and take a break from routine. Our project aims to simplify the car rental process through modern technologies, making it more efficient and user-friendly. Renting a car is essential for many travelers who don't own their vehicle, yet the process can be complicated by hidden charges, unexpected cancellations, and scheduling constraints. To address these issues, we have developed a system using PHP and My SQL that streamlines car rental bookings, enhancing customer satisfaction and business efficiency.

Our system includes options for self-driving cars, allowing users to book vehicles based on their specific travel schedules, companions, and trip types. Unlike traditional platforms, our solution offers a wide range of rental options, setting a new standard in the industry with its flexibility, trust, and personalized service. Key functionalities include real-time booking updates, comprehensive fleet management, secure online payments, and efficient inventory handling. By minimizing paperwork and leveraging customer insights, this system elevates service quality and operational efficiency, creating benefits for both users and car rental companies.

1.INTRODUCTION

The car rental industry has grown significantly in recent years, driven by increased demand in both business and personal travel. However, managing car rental operations poses challenges such as inventory control, customer relationship management, scheduling logistics, secure payment processing, and data protection. A comprehensive car rental management system is needed to address these issues.

The proposed system enhances car rental management with tools for maintenance analysis and identifying underutilized vehicles. It also improves customer data management, including personal information, rental history, and preferences. The system streamlines the booking process, allowing customers to search for available vehicles, make bookings, and select their preferred models and brands.

This platform offers detailed vehicle listings and specifications, enabling informed rental decisions. Users can complete the rental process online, including secure payment, after registering on the platform. Registration is required to access full functionality, including browsing vehicles, viewing specifications, and finalizing rentals.

The system's architecture prioritizes user experience with an interactive, easy-to-navigate interface. It also includes administrative tools for managing promotions and discounts, which can attract customers and boost revenue. Additionally, a feedback system analyzes customer behavior, rental trends, and vehicle usage, providing insights for informed decision-making and competitive strategy development in the car rental industry.

2. LITERATURE SURVEY

There are different types of Booking systems based on the service models. Our proposed car rental system will enhance the user experience by addressing common issues in existing systems. It ensures accurate bookings, provides comprehensive vehicle details, and maintains transparent pricing to prevent charge manipulation. The system features efficient database management for reliable performance, supports flexible reservations with potential discounts, and offers payment methods for convenience. Additionally, it includes a feedback mechanism for continuous improvement. Overall, this system aims to deliver a seamless, trustworthy, and user-friendly car rental experience for both customers and administrators

The Potential of Flexible Reservations in a Car Rentals System with an Auction Scheme:The study by Mireia Roca-Riu and Monica Menendez (2019) proposes a flexible car rental system with an auction scheme, allowing drivers to get discounts by being flexible with booking times. While this can increase vehicle usage and reduce costs, a major disadvantage is that the booking system has accuracy issues, leading to inefficiencies and potential booking errors

Car Rentals System Amey Thakur's 2021: This study discusses a car rental system that allows clients to book vehicles online and have them delivered to their homes. However, a disadvantage is that the system has booking issues and provides insufficient details about the vehicles, such as whether they are air-conditioned or include certain accessories.

Online Car Rental system: The 2022 study by P. Nahnisha, B. Jai Sai Anvitha, and R. Prema discusses an online car rental system that allows clients to make decisions more freely and intuitively. However, a disadvantage is that the system has database issues, leading to inefficient data management.

Web-based platform for online vehicle rental:The study by Vijaykumar Mohite, Pallavi Murkute, and Sayali Kakade describes a system where product information is stored centrallyallowing expenses to be monitored to avoid over-budgeting. However, a disadvantage is that drivers can manipulate the charges displayed during booking, leading to inconsistences when the vehicle arrives.

3.EXISTING SYSTEM

The existing system represents the traditional approach that online car rental companies currently use. The system allows users to book vehicles online through a website. The core limitations of a typical existing online car rental system include:

Limitations:

- **Limited Automation:**Many traditional systems rely on manual processes, especially during the pickup and return of vehicles.
- **User Experience:**User interfaces may not be fully optimized for mobile devices, leading to lower user satisfaction.
- **Lack of Personalization:**Limited personalization in customer experience, such as AI-driven recommendations or dynamic pricing.
- **Inconsistent Customer Service:**Support can be slow or inconsistent across different locations, leading to customer dissatisfaction.
- **Manual Verification:**rental Verification processes(Ex: driver's license check) are often done in person, leading to delays.

Comparison:

Current Systems	Proposed System	Results to be achieved against the proposed System
Customer's Data collection that rented vehicle using bookkeeping process first and then input into computer.	Customer's data collection is using online car rental system application., so the customer data has input directly into the application online.	Customer data arranged neatly, safely and stored in the database so it can be viewed and controlled by the company.
Car rental process by customers is still using rental form in the form of paper media.	Car rental process using web-based online car rental system application which data stored in the database online.	Car rental process will be recorded safely in a computer database.
Calculation rent income has done by counting rental receipts manually and recording it in renal book.	Calculation rent income on the online car rental system website is automatically stored in the database online.	Create efficiency of time, performance, effort and cost. Rental data stored neatly and securely in a database.So it can be viewed and controlled by the company.
Traditional car rental systems maintain hidden charges while booking the car for rent.	Web-based online car rentals expose the charges to customers.	Customers can easily find their budget friendly cars.
Customers may be postponed their schedule due to driver cancellations	Web-based car rental system enables self-driving cars for long rentals	Customers can book available cars without waiting for drivers

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4. PROBLEM STATEMENT

This system is able to assist the owner of car rental in managing the car rental more efficiently. Manually booking is quite difficult for the customer because they need more timeto find information and detail about which car rental are budget free to rent. As for today there is no guide for customer to make references in finding car rentals.

Manually booking is challenging to car's rental owner which is they have to face the high risk. Owners are facing problem that need to take early action if there are sign of damage. This is because the safety is based on customer respectively. Therefore, the owners need to be more concern about what happening to their cars every day.

5. PROPOSED SYSTEM

The Proposed Car Rental System is an online platform designed to facilitate the renting of vehicles by users. The system will allow users to login, check the availability of cars and rent a vehicle based on their preferences and needs.

A. User Interaction and Features

User Login and Registration: Users must log in to the system to access its features. New users can sign up by providing necessary details such as name, address, and phone number**.**

Car Search and Availability Check: After logging in, users can specify their desired car type and the intended date and time of the journey. The system will then check the availability of the requested car.

Car Rental Process: If the requested car is available, the user can proceed to rent the car for the specified duration. The system allows the user to select a vehicle based on their budget, with options categorized into economy and premium segments**.**

Data Management: All data related to the rental cars, user information, and bookings are securely stored in a MySQL database. The system's back-end connectivity is robust, ensuring reliable data handling and transaction processing.

B. System Benefits

Convenience and Accessibility: The use of internet technology allows customers to rent cars at any time, from any location, thus providing significant convenience. The online booking process saves time and reduces the need for manual labour.

Flexible Booking Options: The system categorizes rental cars into economy and premium segments, allowing users to select a vehicle based on their budget and preferences**.**

Streamlined Operations: The Car Rental System streamlines the operations of car rental companies by automating the booking process, reducing the likelihood of errors, and improving overall efficiency**.**

User Interface: The Car Rental System features a simple, intuitive user interface that guides users through the process of checking car availability, booking, and payment. This design enhances user experience by making the system easy to navigate.

6. METHODOLOGY

Product Perspective

The proposed Online Car Rental System is a web-based application designed to manage the rental process efficiently and securely. The system operates on a client-server architecture, with PHP utilized as the front-end programming language and MySQL as the back-end database management system. This combination allows for a dynamic, user-friendly interface that interacts seamlessly with a robust and secure database. The system is designed to handle multiple simultaneous users, ensuring that data integrity and consistency are maintained across all transactions**.**

Product Functions

Functionalities

1) Any person can query for books availability according to specified conditions.

2) Person can book/cancel the book only after he logs in.

3) A user can sign up for a profile if he doesn't have one already.

4) On logging in, the user has options to:

a) Book issued

b) Edit Profile information

c) Cancellation of his booked issued.

d) View all current books booked by him.

e) Logout

5) A person can get all information regarding a car list if he keys in it.

a) A person can get all information about a car if he keys in the book id.

b) Official members are supposed to do that work which distributed by the administrator

c) Administrator or assigned can add/modify/delete car information.

d) Administrator or assigned official members can add/modify/delete seat type according their availability and generate report.

e) Administrator or assigned official add/modify/delete cars information.

f) Administrator or assigned official members can define and manage charges information.

g) Administrator or assigned official members can define scheme and modify time to time and generate report.

h) Administrator can add/modify/delete official member and generate report.

i) Administrator can add/modify/delete user information and generate report.

Operating Environment

The proposed software is to run on client/server model network. A client/server can deliver the better performance than the file server system because a client application and database server work together to split processing load of applications (thus the term distributed processing). The server manages the database among the number of clients, while the client sends, request, and analyse the data entry form with small specific data set, such as rows in a table not file as in the file server system. A database server is intelligent enough so that it locks and return only the rows a client request, which ensure concurrency, minimize the network traffic and increase the system performance.

7. PROJECT MODULES

User Module:

User can login to website if he/she already has an account else he/she has to sign up. It allows users to search and book cars, view and manage bookings, make payments, and access support.

Admin Module:

The admin module allows admins to login and manage vehicle brands, view dashboard status (registered users and bookings, update vehicles, payments etc) and log out.

Database Module:

Database Module consists user details, payment, booking details etc.

Car Module:

The main aim for developing this module is to manage the car.Soall car will be managed by admin. It tracks all the information of the car. We have developed all type of CRUD (Create, Read, Update and Delete) operations of the car.

Booking Module:

The main objective for developing this module is to manage the booking. This Bookingmodule is an important module in this project which has been developed on PHPandMYSQLSo all booking will be managed by admin.

8.PROJECT REQUIREMENTS

Requirement analysis is an essential approach in software engineering, comprising activities that identify and establish the demands or conditions necessary for a new or updated

product. This analysis must consider the potential for competing requirements from various users. The requirements are divided into two categories: functional and non-functional. Functional requirements define the system's internal operations and processes, while non-functional requirements address how the system fulfills these operations.

Functional Requirements

The functional requirements identified for the online car rental system are as follows:

1)Customer Registration: New users should have the capability to register online and print membership cards upon registration.

2) Car Reservation Online: Customers should be able to book and reserve cars online using the system.

3) Automatic Database Update: Whenever a new reservation is made or a customer registers, the system must automatically update the database without requiring additional effort from the administrator.

Non-functional Requirements

The non-functional requirements for the online car rental system are as follows:

1) Security: Access to the firm's secured pages on the system should be restricted to authorized corporate employees. Users must log in with valid usernames and passwords to access the user pages.

2) Performance and Response Time: The system should exhibit high performance when processing user inputs, with response times of approximately 20 to 25 seconds for less complex tasks and up to 50 seconds for more complex tasks.

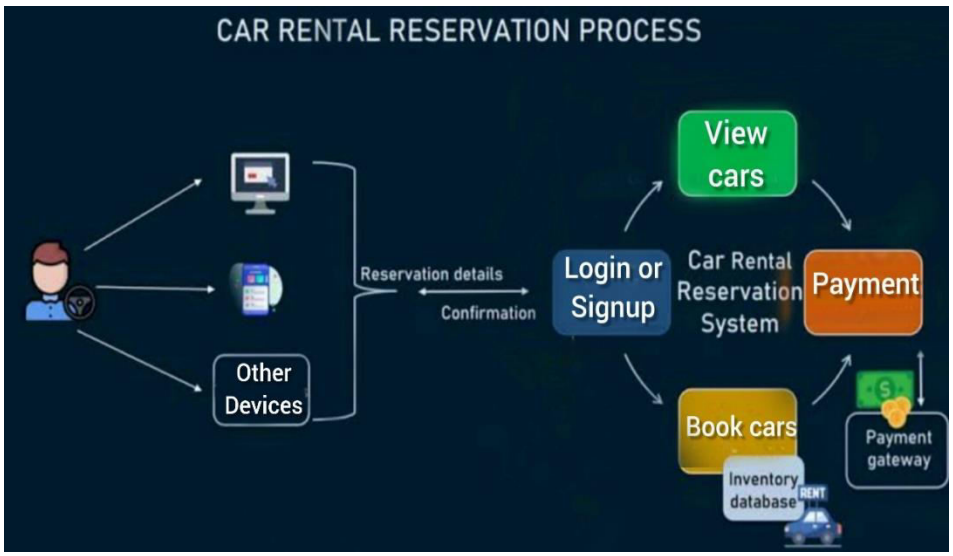
3) Error Handling: Errors should be minimized, and appropriate error messages should guide users through the recovery process. User input validation is crucial. The system should recover from errors within 15 to 20 seconds.

4) Availability: The system must be accessible 24 hours a day, seven days a week. In case of a catastrophic failure, the system should be restored within 1 to 2 business days to prevent disruption of the business process.

5) Ease of Use: The user interface should be simple yet high-quality, designed to be easily understandable by users with minimal training.

9. SYSTEM ARCHITECTURE

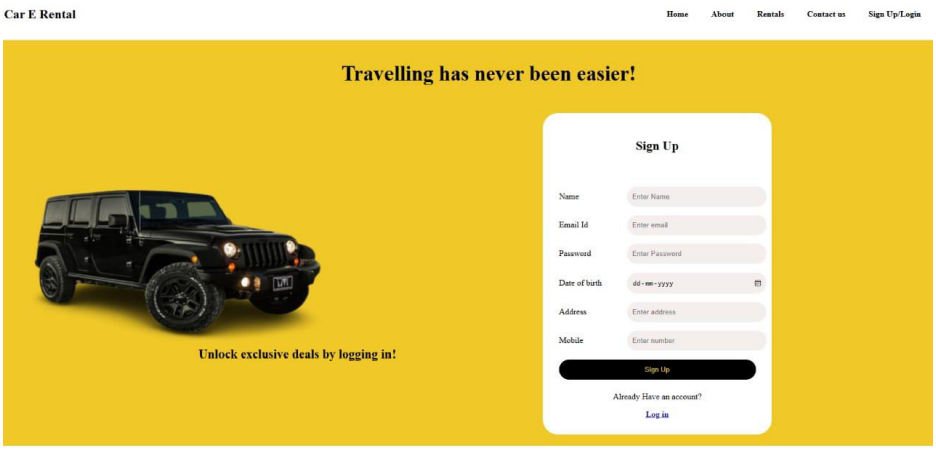
Web-Based car rental system integrated with a user-friendly interface. By using this system, employee can manage bookings, payment and vehicle issues within a few clicks. The new data can be added or an existed data can be edited or deleted too by administrators. Thus, there is no delay in availability of any information, whether needed can be captured quickly. For security purposes, all customers need to create a new account before logging in or he/she can log into the system with his/her created account before they can make a reservation for a car.



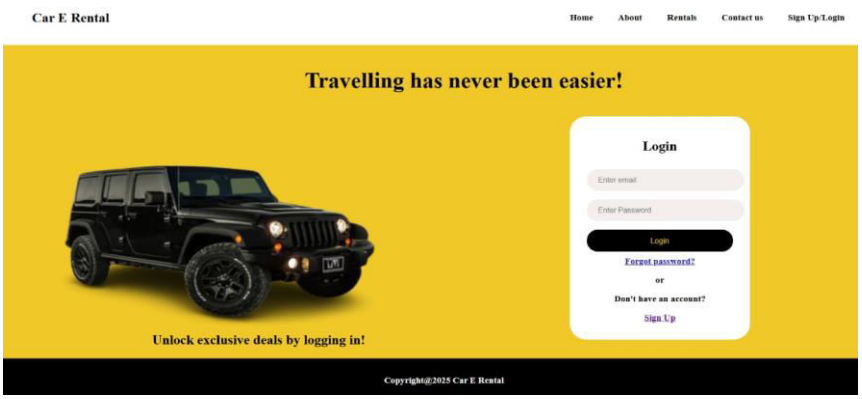
10.RESULTS

The web based Online vehicle Rental system has offered an advantage to both customers as well as Online Vehicle Rental Company to efficiently and effectively manage the business and satisfies customers need at the click of a button.

Customer need to be signup into the website using he/she credentials before logging into the website.



Sign Up Page



Login Page

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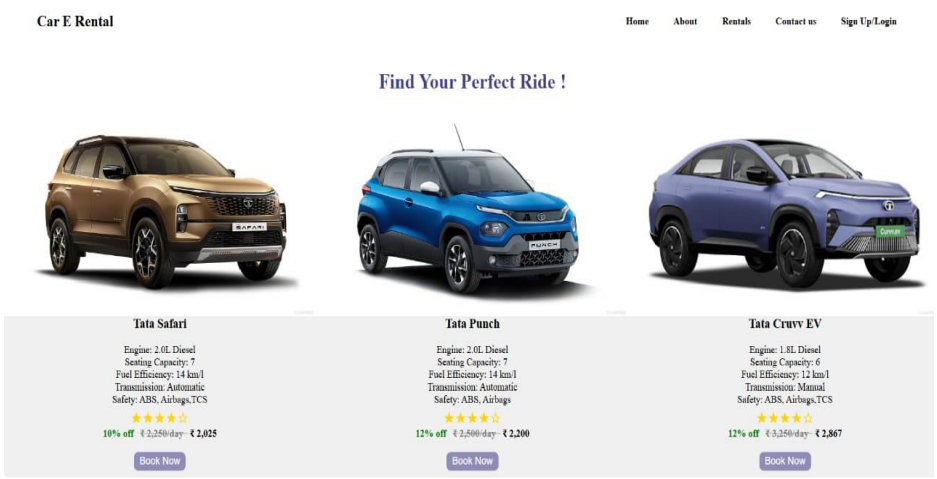

Car lists

11. FUTURE SCOPE

Subscription-based Services: Introducing car subscription models where users pay a monthly fee for flexible access to different types of vehicles can attract long-term customers looking for alternatives to car ownership**.**

AI and Machine Learning for Personalization: AI can be utilized for better customer service, such as recommending vehicles based on customer preferences, optimizing pricing strategies, and predicting customer demand for better fleet management.

Enhanced User Experience with AR/VR: Augmented and virtual reality could be used to enhance the user experience, from virtual car tours before renting to immersive customer service experiences.

Mobile Application Development: Plans to create mobile version of the platform to further enhance accessibility.

Geo-location Services: Integrating real-time geo-location features to provide users with location-based offers and services.

AI Chatbot Implementation: To enhance customer support and provide instant assistance for queries and booking issue.

12.CONCLUSION

The online car Rental System has successfully transformed the traditional car rental process by utilizing web-based technology to enhance customer experience while improving operational efficiencies for rental agencies. By focusing on user needs and addressing common pain points, the project has laid a strong foundation for future growth and development in the online car rental industry.

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