

Vehicle Parking Management System

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Abstract: *The proposed project is a Vehicle parking management System that provides customers an easy way of reserving a parking space online. It overcomes the problem of finding a parking space in commercial areas that unnecessary consumes time. Hence this project offers a web based reservation system where users can view various parking areas and select the space to view whether space is available or not. If the booking space is available then he can book it for specific time slot. The booked space will be marked yellow and will not be available for anyone else for the specified time. This system provides an additional feature of cancelling the bookings. User can cancel their books space anytime. Users can even make payment online via credit card, debit card, paytm, on cash, etc .After making payment users are notified about the booking via email along with unique parking number.*

Keywords: Vehicle Parking Management System, is a parking management system, parking reservation system, Application on vehicle parking, to book your slot by online website.

I. INTRODUCTION

Vehicle parking system for managing the records of the incoming and outgoing vehicles in an parking house. It's an easy for Admin to retrieve the data if the vehicle has been visited through number he can get that data.

Now a days in many public places such as malls, multiplex system, hospitals, offices, market areas there is a crucial problem of vehicle parking. The vehicle parking area has many slots for parking vehicle. So to park a vehicle one has to look for all the lanes. Moreover this involves a lot of manual labour and investment. Instead of vehicle caught in towing the vehicle can park on safe and security with low cost. Parking control system has been generated in such a way that it is filled with many secure devices such as, parking control gates, toll gates, time and attendance machine, vehicle counting system etc. these features are hereby very necessary nowadays to secure your vehicle and also to evaluate the fee structure for every vehicles entry and exit.

The objective of this project is to built a vehicle parking management system that enables the time management and control of vehicles using number plate recognition. The system that will track the entry and exit of cars, maintain a listing of cars within the parking lot, and determine if the parking lot is full or not. It will determine the cost of per vehicle according to their time consumption.

II. LITRATURE SURVEY

a: Smart Parking Systems: Numerous studies explore the concept of smart parking systems using various technologies like sensors, IoT, and data analytics to optimize parking space utilization, reduce congestion, and enhance user experience.

b: Sensor Technologies: Research investigates the effectiveness of different sensor technologies such as ultrasonic, infrared, and magnetic sensors in detecting vehicle presence and guiding drivers to available parking spaces.

c: Data Analytics: Literature highlights the significance of data analytics in predicting parking demand, optimizing parking operations, and providing real-time information to users.

d: User Experience and Satisfaction: Studies focus on assessing user satisfaction with parking management systems, including factors like ease of use, convenience, accuracy, and reliability.

e: Integration with Smart Cities: Some research explores the integration of parking management systems with broader smart city initiatives to improve urban mobility, reduce emissions, and enhance overall urban quality of life.

f: Security and Privacy Concerns: Addresses security and privacy issues associated with parking management systems, including data protection, unauthorized access, and potential risks of cyber-attacks

According to Shem, S, S. Park and S.Hong (2006) vehicle parking system (VPS) is web-based used to reserve a park and data processing system. Drivers are no longer disturbed to park their vehicle since the system generate the parking lot number on VPS platform. A system requirement of VPS requires a currently supported version of Microsoft internet explorer or Firefox. Access to confidential data in VPS is secured using 12-bit secure socket layers (SSL)

According to Whapples (2005), vehicle parking management will be also much faster, easier on both sides (means clients and company). The time taken to serve a client is significantly reduced since even the payment is done online. On company side this system will help their records (such as clients" details) to keep it in a secure way. About the payment, the vehicle parking management system will achieve its improvement by using payment method such as Contact method and contactless method

III. PROPOSED METHODOLOGY

Designing a vehicle parking management system involves several key steps

- **Requirement Analysis:** Understand the requirements of the system, including the number of parking spaces, types of vehicles allowed, payment methods, etc.
- **System Design:** Create a high-level design outlining the system architecture, components, and interactions between them. This may include the use of sensors, cameras, payment terminals, and a central management system.
- **Database Design:** Design the database schema to store information about parking spaces, vehicle details, transactions, etc.
- **User Interface Design:** Develop user interfaces for various stakeholders, such as administrators, parking attendants, and customers. This may include web portals, mobile apps, and kiosks.
- **Integration of Sensors and Devices:** Implement the hardware components, such as sensors for detecting vehicle presence, barriers for entry and exit, and payment terminals.
- **Algorithm Development:** Develop algorithms for parking space allocation, vehicle detection, payment processing, and reporting. **Payment Integration:** Integrate payment gateways to facilitate cashless transactions via credit/debit cards, mobile wallets, or other electronic payment methods.
- **Security Measures:** Implement security measures to protect user data, prevent fraud, and ensure the safety of vehicles within the parking facility.
- **Testing and Quality Assurance:** Perform thorough testing of the system to ensure reliability, scalability, and usability. This includes unit testing, integration testing, and user acceptance testing.
- **Deployment and Maintenance:** Deploy the system in the parking facility and provide ongoing maintenance and support to address any issues and incorporate updates or enhancements.

IV. IMPLEMENTATION

Implementing a Vehicle Parking Management System requires a systematic approach. Here's a step-by-step implementation guide:

Requirement Analysis:

Gather requirements from stakeholders including users, administrators, and management. Define functionalities like user registration, booking, payment processing, admin dashboard, etc.

Design Phase:

Design the system architecture including database schema, user interfaces, and backend services.

Decide on the technology stack (programming languages, frameworks, databases) based on scalability, security, and ease of development

Database Design:

Design the database schema to store information about parking spots, users, bookings, payments, etc. Choose a suitable database system (e.g., MySQL, PostgreSQL) and create tables with appropriate relationships.

User Interface Development:

Develop user interfaces for different user roles (customer, admin) using HTML, CSS, and JavaScript. Ensure the interfaces are responsive and user-friendly across different devices.

Backend Development:

Implement server-side logic using your chosen programming language (e.g., Python, Node.js, Java). Develop APIs for user authentication, booking management, payment processing, etc. Integrate APIs with third-party services for features like payment processing and geolocation.

Authentication and Authorization:

Implement user authentication using methods like username/password, OAuth, or JWT tokens. Define user roles (customer, admin) and restrict access to certain functionalities based on roles.

Booking Management:

Develop features for users to search for available parking spots based on location, date, and time. Implement booking functionality allowing users to reserve parking spots and receive confirmation.

Payment Processing:

Integrate payment gateway APIs (e.g., Stripe, PayPal) to facilitate secure online payments. Implement features for users to add payment methods, make payments for bookings, and receive payment confirmation.

Admin Dashboard:

Develop an admin dashboard with features for managing parking spots, bookings, payments, and user accounts. Include analytics and reporting capabilities to monitor parking usage, revenue, etc.

Testing:

Perform unit testing for individual components and integration testing for the entire system. Conduct user acceptance testing (UAT) with real users to validate functionality and identify any issues.

Deployment:

Deploy the application to a hosting environment (e.g., cloud platform like AWS, Azure, or on-premises server). Configure monitoring and logging to track system performance and detect errors.

Training and Documentation:

Provide training to users and administrators on how to use the system effectively. Create documentation including user manuals, API documentation, and troubleshooting guides.

Maintenance and Support:

Regularly update the system with new features, bug fixes, and security patches. Provide ongoing support to address user inquiries and technical issues.

By following these steps, you can successfully implement a Vehicle Parking Management System that meets the needs of both users and administrators.

Requirement Specification

Hardware Requirements

- Processor : Any Processor above 1GH & Above .
- RAM: Minimum 4GB.
- Hard Disk: Minimum 500GB.

The project developed into investigating various methods and algorithms relevant to language translation :

Front end

HTML (Hypertext Markup language) : HTML is used to structure the content of the webpage

CSS (Cascading Style Sheets) : CSS is used to style the HTML elements and make the interface visually appealing and user-friendly.

Bootstrap: Bootstrap is a popular front-end framework for building responsive and mobile-first websites.

JavaScript : JavaScript is used to add interactivity and dynamic behavior to the webpage

JQuery : jQuery is to make it much easier to use JavaScript on your website.

Backend

PHP can be used on the backend to handle various task that required sever-side processing and logic.

Software is used and perform a program in XAMPP, VS CODE.

Database is used MySQL 8.0 or Oracle database ensure a flow of data.

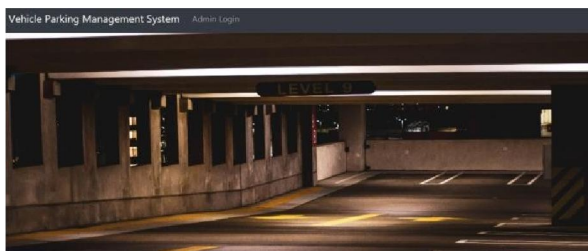
Testing and Deployment

Beta Testing: Conduct beta testing with a small group of students to gather feedback on app functionality, usability, and overall effectiveness.

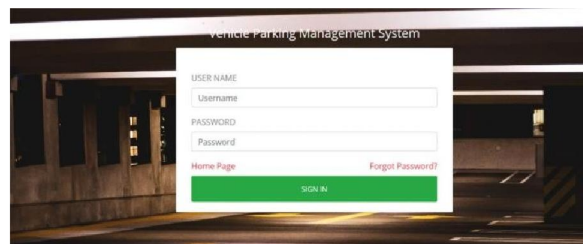
Deployment: Once refined based on feedback, consider deploying the app to the Google Play Store for wider accessibility

V. OUTCOME

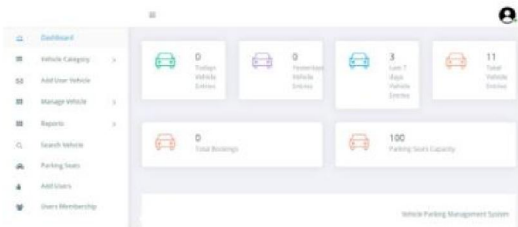
Home Page



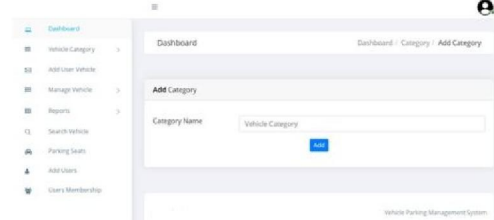
Login Page



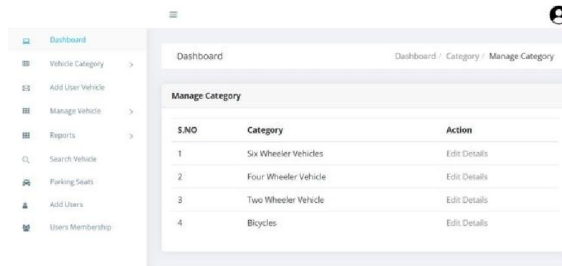
Dashboard



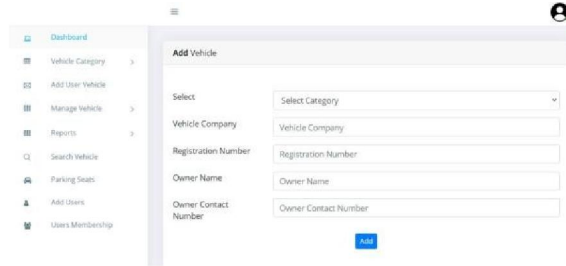
Add category



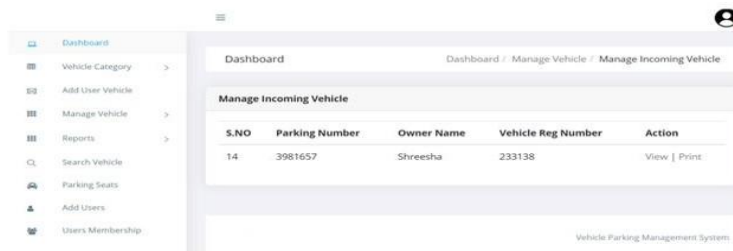
Manage category



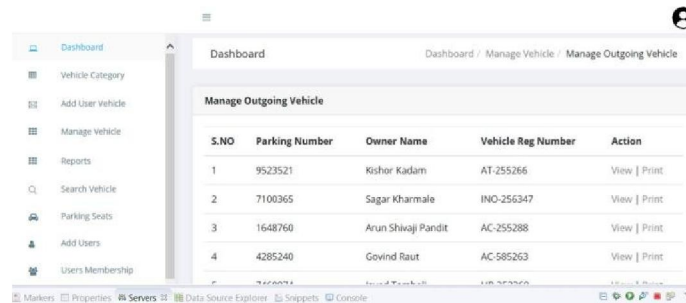
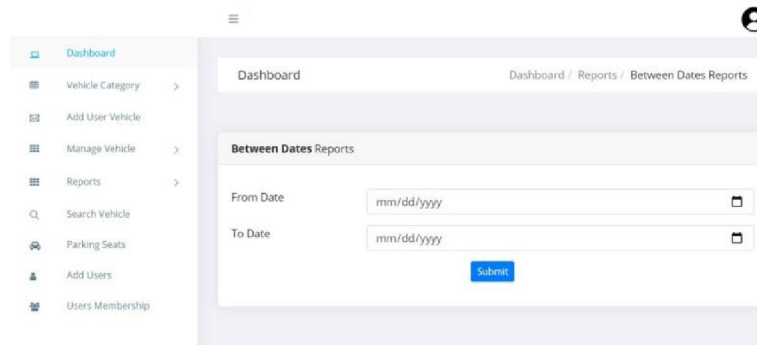
Add Vehicle



Report



Outgoing vehicle



VI. FUTURE SCOPE

Our System Vehicle Parking Management System is mainly used in big cities where now finding parking space can cause a lot of traffic problems to other vehicle and can take much time. So, this version of computerized program will now help in those fields. It can only be managed by one people efficiently. Although we have achieved many of our thoughts for this project but there are still some which we need to work. In future we would now like to improve financial transaction in computerized method according to time. We will be thankful for your honest review of this software so we can make it even more efficient and update with new feature.

VII. ACKNOWLEDGMENT

We extend our sincere gratitude to all those who contributed to the successful completion of the project on the Vehicle Parking Management System.

Firstly, we would like to express our heartfelt thanks to [Supervisor's Name], our project supervisor, for their invaluable guidance, continuous support, and insightful suggestions throughout the development process. Their expertise and encouragement were instrumental in shaping the project and steering it towards excellence.

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Last but not least, we express our gratitude to our families and friends for their understanding, patience, and encouragement during the project duration.

This project would not have been possible without the collective efforts of everyone involved. Thank you for your unwavering support and commitment.

VIII. CONCLUSION

This project was developed using PHP with MySQL is based on the requirement specification of the user and the analysis of the existing system, with flexibility for future enhancement. VEHICLE PARKING MANAGEMENT SYSTEM is very useful for clients and drivers as they can book parking space from home and admin can manage them. In big city areas finding a parking place for vehicle has been almost like impossible and everything was done manually requiring many labors so this project will help a lot in those area as it requires only few people to run it. This particular project deals with the problems on managing a parking space and avoids the problems which occur when carried manually. Identification of the drawbacks of the existing system leads to the designing of computerized system that will be compatible to the existing system with the system which is more user friendly and more GUI oriented.

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