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Park Easy: Cloud-Based Smart Parking System

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Abstract: ***A modernized parking management system revolutionizes the way people locate and utilize parking spaces. Leveraging advanced technology, it continuously monitors and administers parking spots in real-time. Through our software accessible on various devices, drivers are effortlessly directed to available parking spaces. Moreover, the system efficiently tracks the duration of parked cars and facilitates cashless payment methods. In essence, it simplifies, expedites, and organizes the parking process for all users. In today's era, effective vehicle management is crucial for streamlining operations and maximizing resource efficiency. This comprehensive system aims to elevate control and oversight of vehicular assets, ensuring optimal utilization and reducing operational intricacies.***

Index Term: Vehicle parking, parking management, Parking reservation system, Application on vehicle parking

I. INTRODUCTION

A smart parking management system utilizes advanced technology to simplify and organize parking. Picture a crowded parking lot where finding a spot is challenging. This system guides drivers to vacant spots, speeding up the parking process. Additionally, it streamlines payment procedures, ensuring a hassle-free experience. It's a contemporary solution to the enduring issue of parking space scarcity.

This system merges technology with common urban challenges, tackling the ongoing struggle of finding parking in busy areas. Consequently, drivers are efficiently directed to available spots, reducing the time spent searching.

Cloud-based smart parking not only streamlines parking but also offers numerous advantages. It cuts down on parking time and frustration, alleviates traffic congestion, reduces emissions, and enhances urban mobility. For parking providers and city authorities, it boosts revenue, improves resource management, and provides valuable insights through data analysis.

II. RELATED WORK

Hardik Tanti [3] has implemented a computerized system aimed at delivering efficient parking services to citizens across different organizations. This system utilizes Internet of Things (IoT) technology, leveraging sensors to connect physical parking space infrastructures with information and communication technology. Additionally, cloud services are utilized to enhance the functionality and accessibility of the system.

Mohd Yamini Idna Idris [4] has used to overcome the Obstacle of Payment which are conventional method that causes delay and inconvenience for the sponsors as they must deal with cash problems.

Dániel Kondor [5] must capture the overall vehicular mobility demand in certain cities. It provides a precise and comprehensive simulator for urban mobility which maps the details movements of the city corresponding to peoples. Their methodology is used to scale easily and applied to cause and other assumptions to travel demands. They use a methodology based on bipartite matching of cars and other vehicles for parking spaces.

Can Biyik [6] It is used to overcome the challenges of private parking which is used by people daily in large quantities. That is why parking spots in big cities and places are a problem. The smart parking system comprises a sophisticated architectural framework housing diverse applications and components seamlessly integrated within the system. This Reserved Parking lets users request the application layers to request and be processed through a network layer.

Anusha, Arshitha M S, and Anushri [7] The Internet of Things (IoT) enables remote control of objects over established network infrastructure, opening avenues for seamless integration of the physical environment into computer-based systems. It provides the efficiency, accuracy, and economic benefits. Everything is uniquely identified at its level and worked across the state of the levels so every part can be interpreted to other levels and states.

Thanh Nam Pham [8] It is used to forego problems and take advantage of the significant development in the various technologies of the Internet Of Things (IoT) which has created a significant transformation has taken place in many aspects of life, including the development of smart parking systems. Our system constructs every car park as an IoT network.

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III. PROPOSED SYSTEM

The vehicle Parking Management system is a web-based technology that will manage the records of the incoming and outgoing vehicles in a parking house. It is an easy for Admin to retrieve the data if the vehicle has been visited through number he can get that data. Vehicle parking management system is an automatic system that delivers data processing in very high speed in a systematic manner.

VPMS has two modules i.e. Admin, User**.**

A. Admin

1) Dashboard: In this section, admins can quickly see the number of vehicle entries within a specific time frame.
2) Category: Here, admins can handle categories by adding, updating, or deleting them.
3) Add Vehicle**:** In this section, admin add a vehicle which is going to park.
4) Manage Vehicle: In this section, admins can oversee incoming and outgoing vehicles, set parking charges, and add their comments or remarks.
5) Reports: Here, admins can generate reports of vehicle entries within a specified date range.
6) Search**:** In this section, admin can search a particular vehicle by parking number.

Admin can also update his profile, change the password, and recover the password.

B. Users

1) Dashboard**:** It is welcome page for a user.
2) View Vehicle: In this section, users can access details of the vehicles they have parked.

IV. SYSTEM ARCHITECTURE:

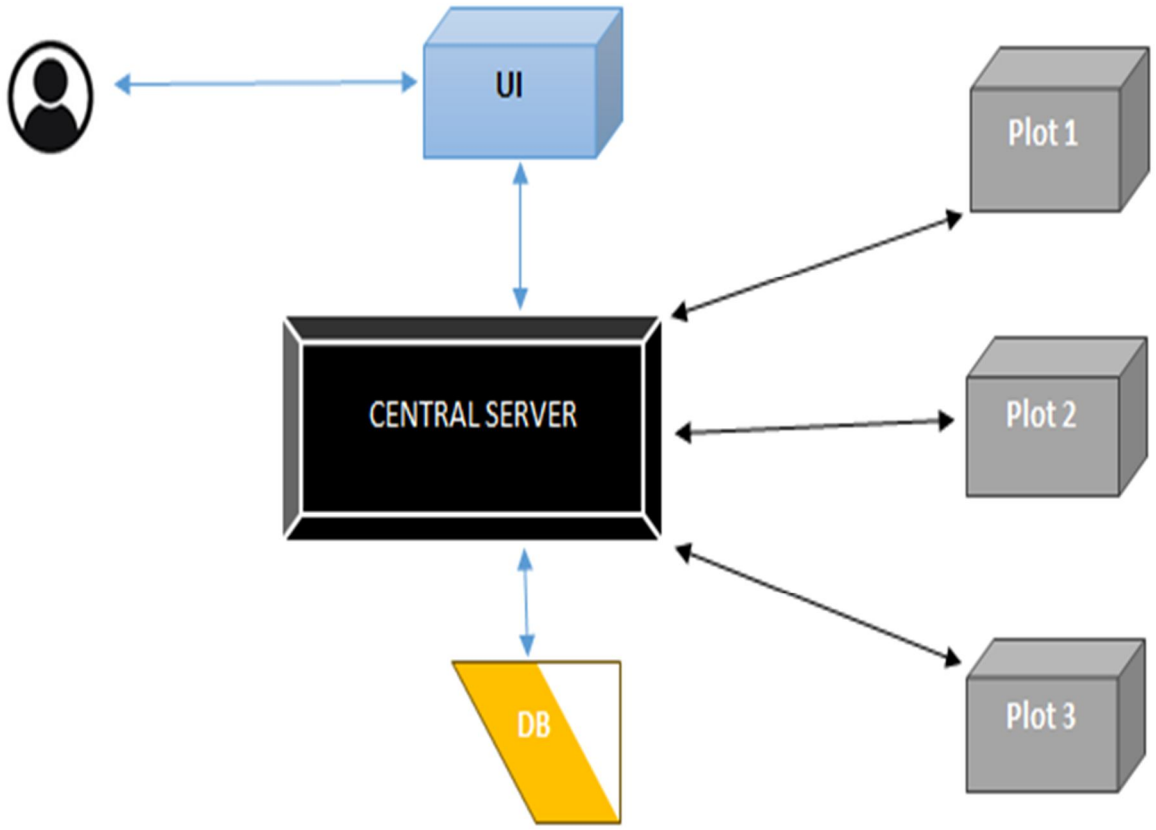
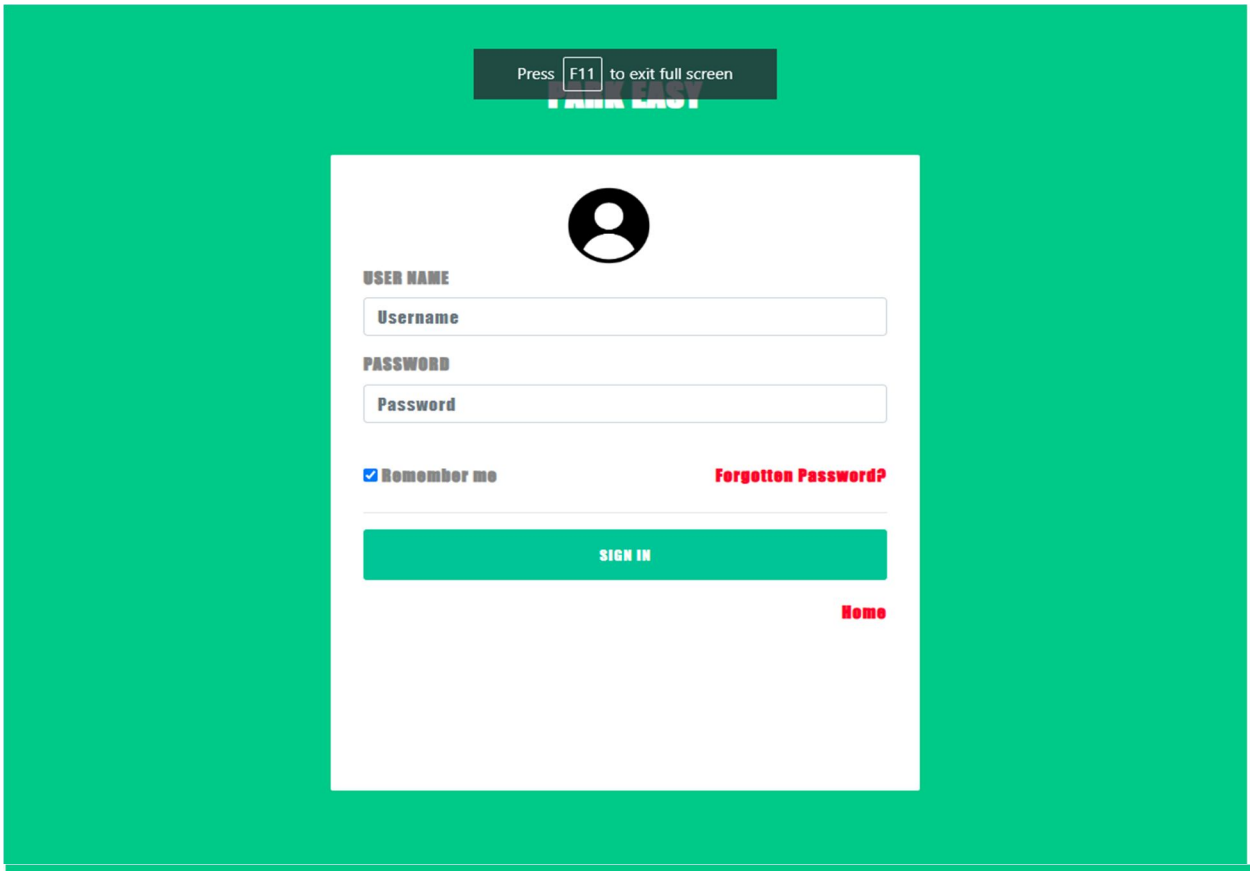


FIGURE 1. SYSTEM ARCHITECTURE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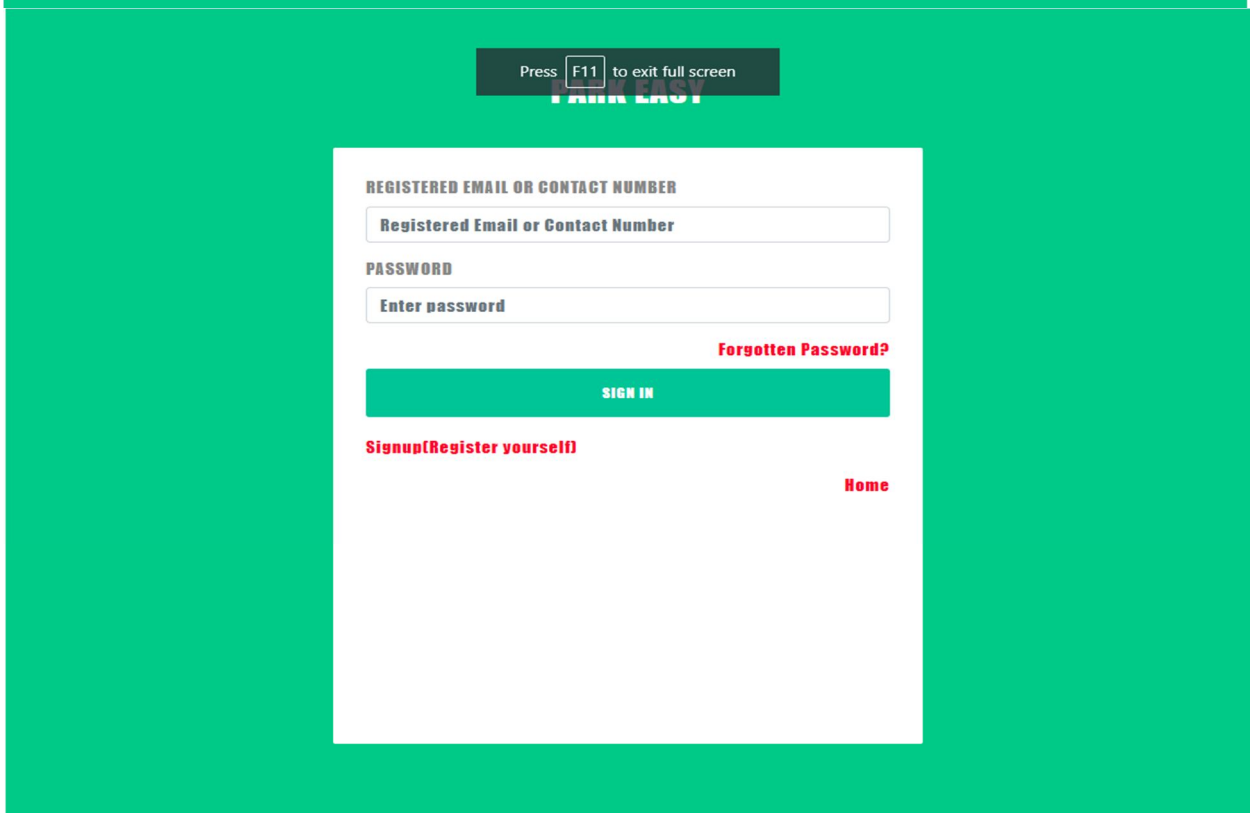
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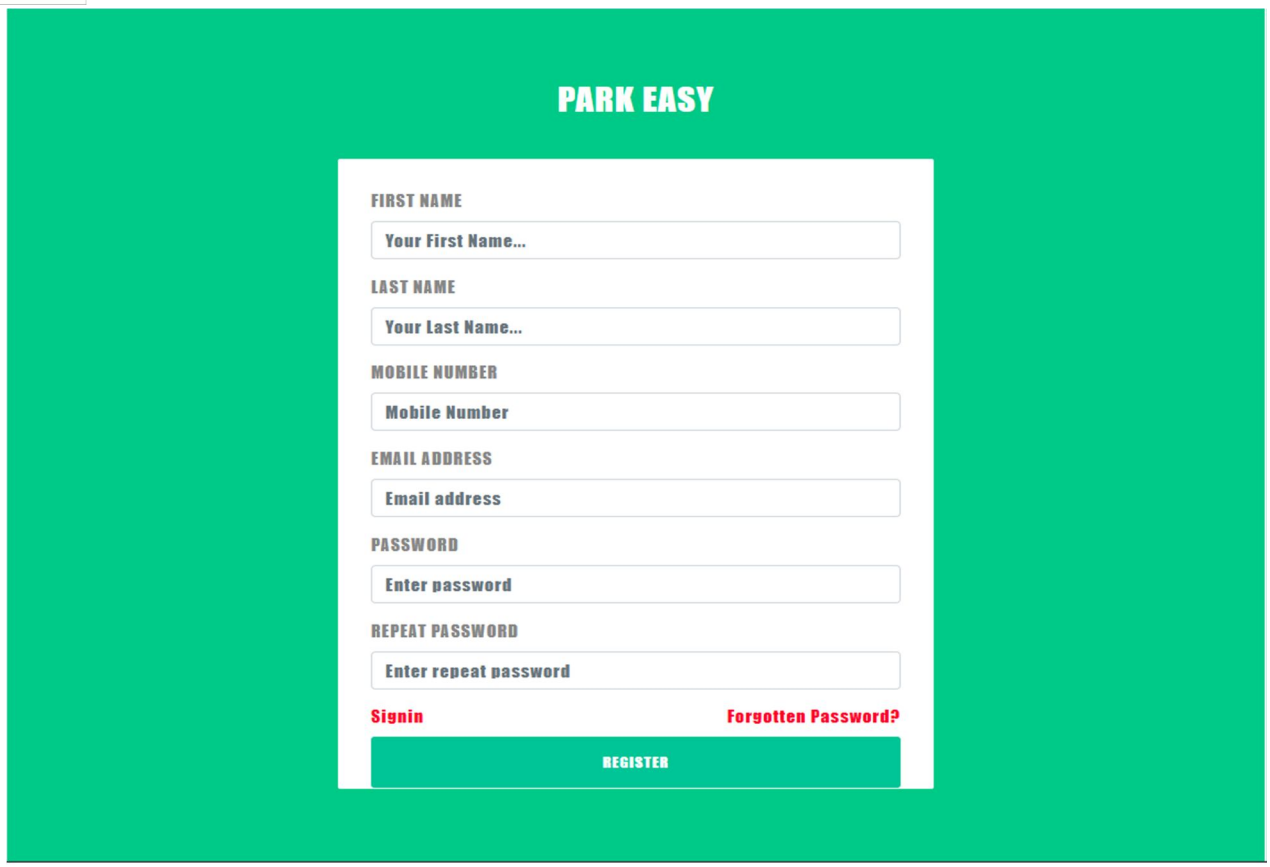

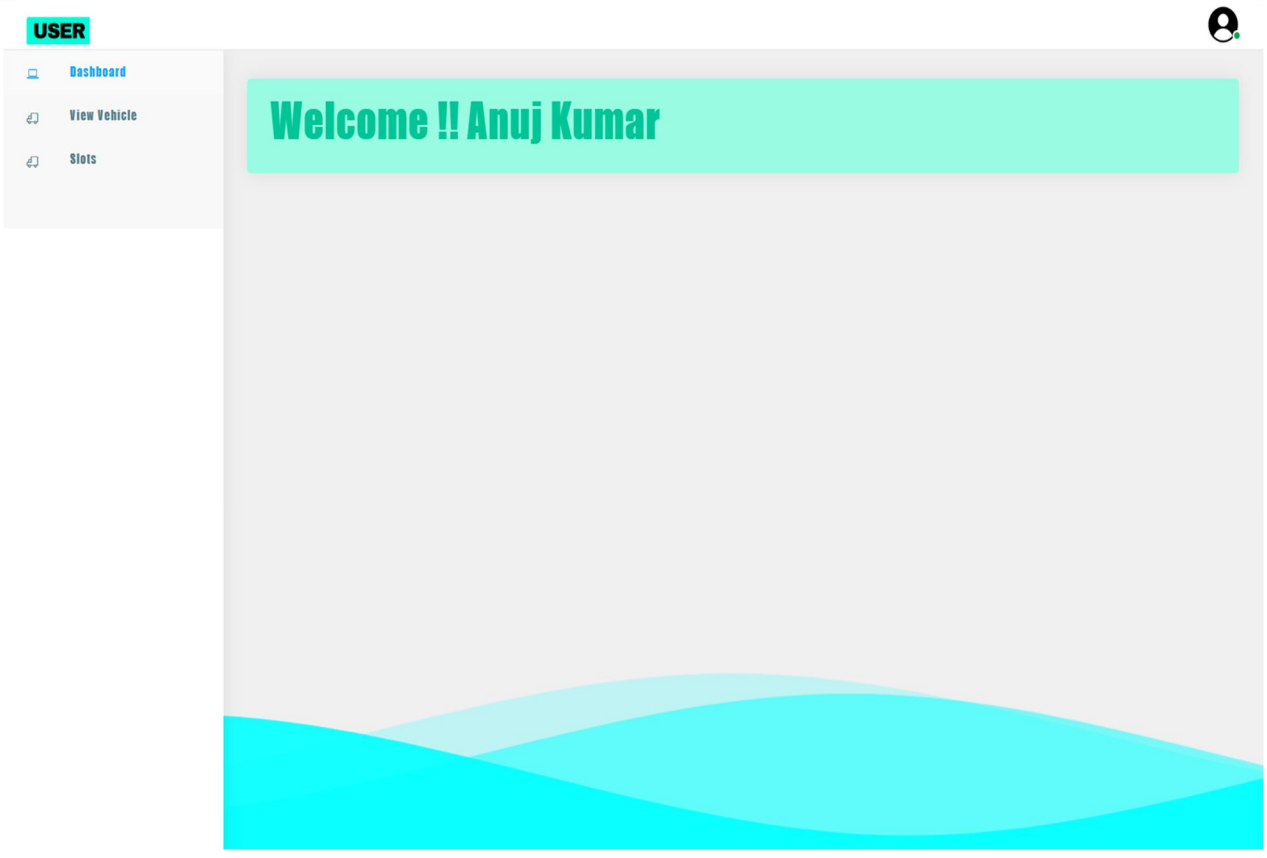

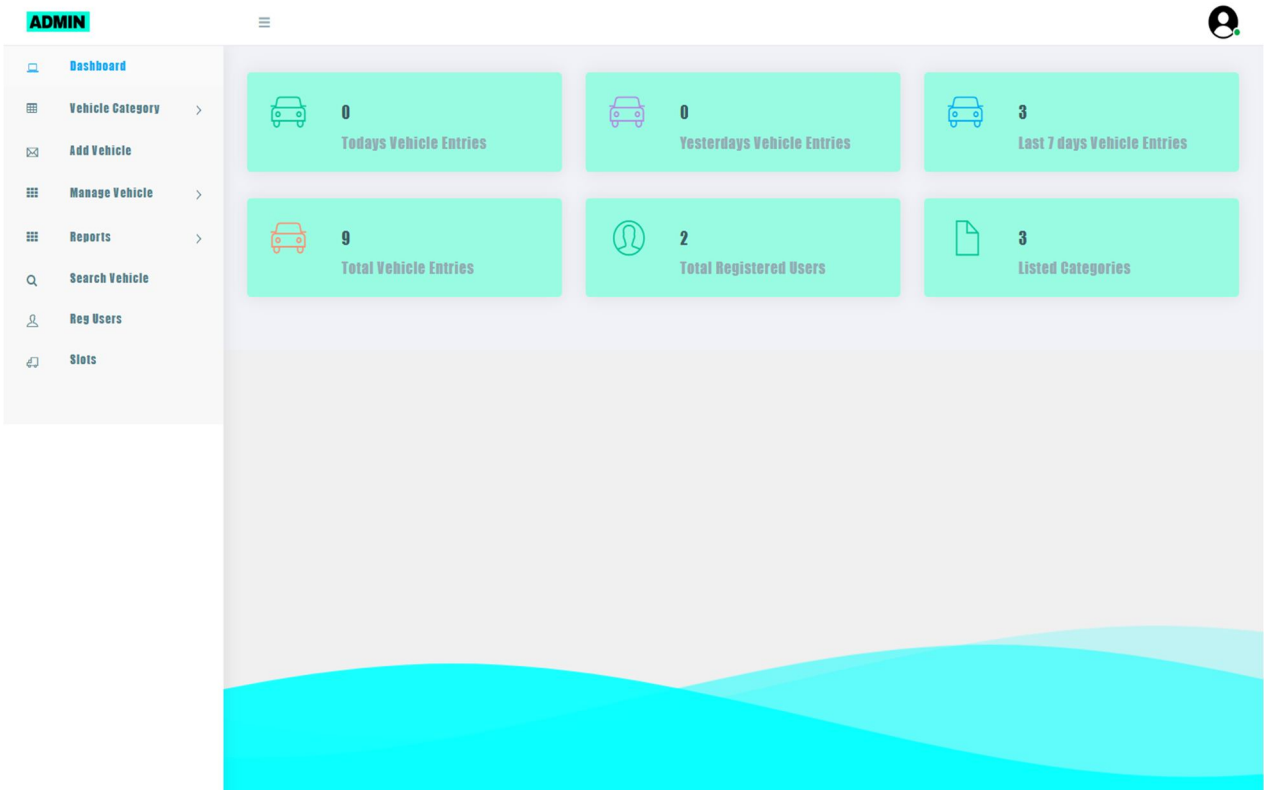

V. ADVANTAGES

1) Efficient Use of Space: Easy Park optimally assigns parking spots based on real-time availability, easing congestion, and ensuring parking facilities are utilized to their maximum potential.
2) Improved User Convenience: Integration with mobile apps and digital platforms ensures a smooth user experience, offering features such as parking reservations and cashless transactions.
3) Eco-Friendly Practices: Easy Park encourages the use of electric vehicle (EV) charging stations and prioritizes parking for low-emission vehicles, contributing to reduced carbon emissions and supporting sustainable urban development initiatives.
4) Reduced Traffic Congestion: By guiding drivers to available parking spaces efficiently, Easy Park helps alleviate traffic congestion and promotes smoother traffic flow in urban areas.
5) Scalability and Adaptability: Easy Park solutions are designed to grow and evolve with urban environments, offering flexibility to meet changing needs and support future expansion plans.

VI. APPLICATION

1) Urban Parking Management: Easy Park can be deployed in city centers to manage on-street parking spaces efficiently.
2) Shopping malls and Commercial Complexes: shopping malls and commercial complexes can utilize Easy Park to offer visitors a hassle-free parking experience.
3) Airport Parking: Airports can implement Easy Park to optimize parking space utilization and improve the overall parking experience for travelers.
4) Corporate Parking Facilities: Easy Park can be deployed in corporate campuses to manage employee parking efficiently.
5) Hospital and Healthcare Facilities: Easy Park can be utilized in hospital and healthcare facility parking lots to improve accessibility for patients, visitors, and staff.

VII. CONCLUSION

Easy Park's cloud-based smart parking system offers a comprehensive solution to alleviate the challenges associated with parking management in urban areas.

By leveraging cloud technology, Easy Park provides a seamless experience for both parking operators and users alike. The system enhances operational efficiency by streamlining parking space allocation, reducing congestion, and minimizing manual interventions. Through real-time data collection and analysis, Easy Park enables parking operators to optimize their resources effectively, resulting in improved revenue generation and cost savings.

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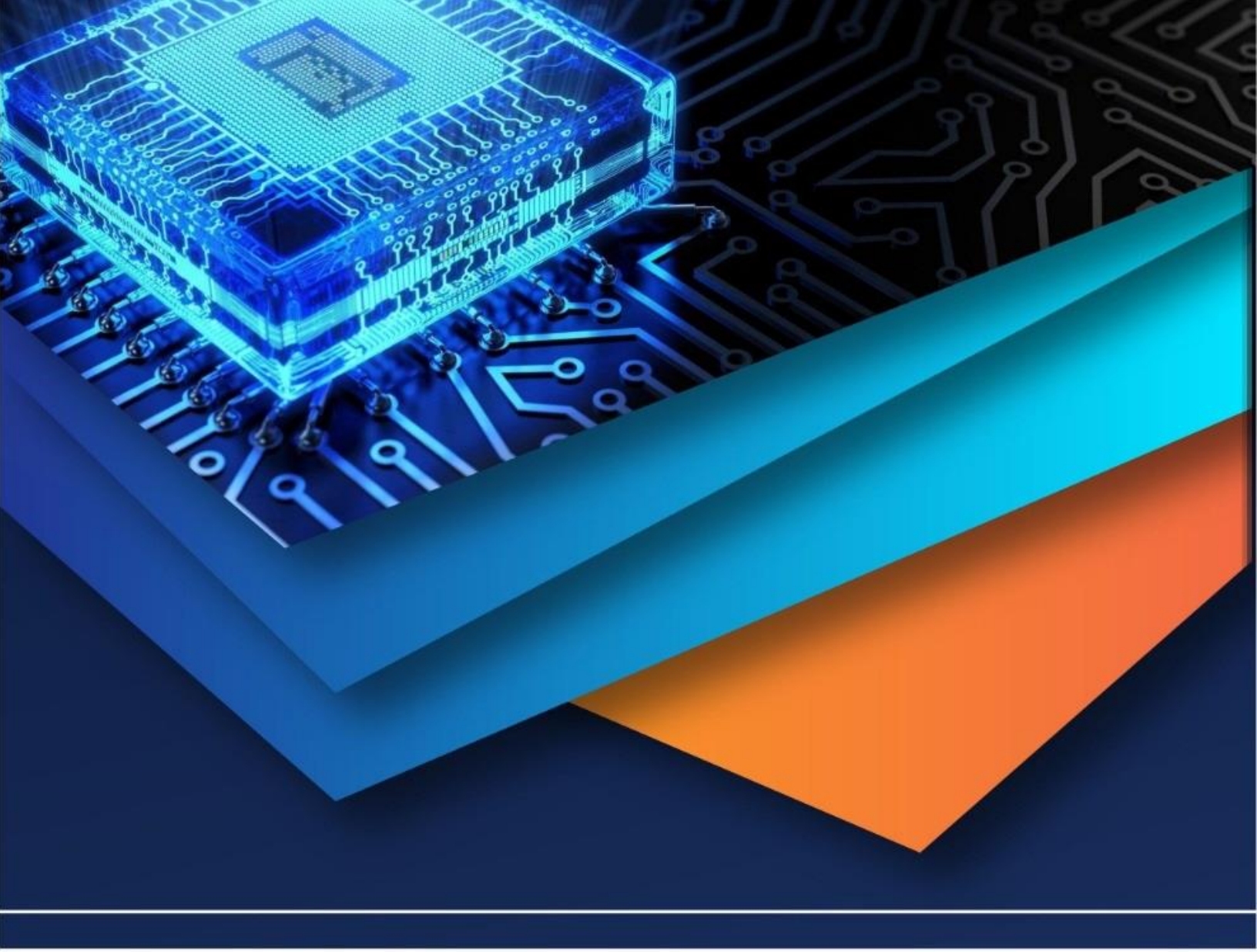

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