Smart Parking System

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Abstract - **Currently, parking area constitutes nearly most of the traffic congestion is caused by vehicles searching around their destination and looking for a place to do parking. Due to this reason, many day-to-day activities are affected such as fuel wastage, time wastage, pollution, etc. These factors motivated us to build a new method for smart parking systems. [7]**

In this paper we have presented the Android based smart parking system based on how users are able to find parking slots online and reserve it. Also, in this system, users can reserve the parking slot in the specific zone, checking the free slots and reserving it as per the needs of the vehicle. Further the QR code is generated which encodes the unique details of the user. QR code is used for encryption and to ease the process of authentication. The Vehicle entering into or leaving the parking slot is controlled by an Android-based application. With various payment methods, users can make their transaction safely. The algorithm helps improve the probability of successful parking and minimizes the user waiting time. Thus, by using this system it becomes more convenient for users to make booking and park the vehicle in the peak hours.

Keywords: Smart Parking, Reservation of Parking, android application, vehicle and parking guidance.

I. INTRODUCTION

Today we are facing so many problems. Two of those acute problems is parking problem and traffic congestion.

The car parking problem is a major contributor and has been, still a major issue with increasing vehicle size in the confined parking spaces in urban cities. Searching for a parking space is a routine activity for many people in cities around the world. Smart parking helps one of the biggest problems on driving in urban areas; finding empty parking spaces and controlling illegal parking. [6]

A smart parking is one which allows user to perform the task such as:

1. To see all the features at a particular place.

2. To know about the space availability for parking.
3. To know about parking places available near destination.
4. To know about the cost for parking space allotted.
5. To check about the confirmation of slot booked.
6. To do a safe and secure transaction.[5]

By knowing the real-time availability of free parking spaces and communicating to the users can be of great help in reducing the queues, improve scalability, and the time required to find an empty space in a parking lot.

Therefore, we propose a system in which, users can reserve the parking slot in the specific zone, checking the free slots and reserving it as per the needs of the vehicle. The Vehicle entering into or leaving the parking slot is controlled by an Android-based application.

II. MODULES

In our system there are two modules:

1. Admin login
2. User login

Admin can check how many bookings are made by the user. Admin will also manage all the booking which will be made by the user. Users have to first register themselves to login into the system.

After logging in to the application, the user can book their parking place in advance. Along with advance booking, the user can also check the availability of parking places. Users will also be able to do the transaction online.

III. LITERATURE REVIEW

There are several applications that provide facilities for online booking of slots and do the parking. The proposed approaches have only focused on only some of the features like user verification and slot booking.

Several patents giving a brief about the idea are:

Sr. No.	Patent/Research paper	Title	Inventor	Description
1.	Patent	A citywide parking reservation system and method	Itamar RosenHaim Yosef GotliebOrri BenNathanElime	This patent describes the database of individual parking spots, each of said individual parking spots associated with a unique identifier (UID) and a current availability status.[8]
2.	Patent	Parking system	Imran Siddiqui Mohammad	This patent describes that the unique code is associated with the parking space and to make available to parking users an application.
3.	Patent	Parking coupon and fee calculation system and operation method.	Deokyu shin	This patent relates to a system for processing a parking coupon and settling a parking fee, which establishes a smartphone application and combined parking control and fee settlement server.
4.	Patent	Parking control system with dynamic allocation of parking places to prioritized vehicles.	Edouard Menoud	This patent shows the parking slots are permanently or temporarily reserved for users registered in the database of a server communicating with the process controllers.
5.	Patent	Level is parked control method and control system.	Xu Zhen	This patent describes to determine the target location of parking and calculating is parked initial position.

IV. SYSTEM ANALYSIS

4.1 Study of Current System

The current system is capable of finding parking locations nearby your current location or for a specific address. It also lets you search and view both free and paid parking spots with information on available facilities such as valet services, car wash, and car charging.

4.2 Problems and Weaknesses of Current System

1. The parking systems available are not secure and not preferred by all.
2. Current system lacks in showing the availability status of slots.
3. From the security point of view current system is not feasible, having chances of misleading the information.

4.3 Requirements of New System

In today's world, people are very mush busy and have less time which can't be just wasted in search of parking places. This System is also being not so secured. So, there is a requirement of new system so that better functionality is provided and to overcome all the problems and weaknesses of the existing system.

An improved system is needed for this idea. As mentioned in the above section of problems and weaknesses we need to use the QR technology for doing safe and secure parking, so, this can be done through this new system.

V. PROPOSED SYSTEM

The proposed system is the Android based smart parking system based on how users are able to find parking slots online and reserve it. Also, in this system, users can reserve the parking slot in the specific zone, checking the free slots and reserving it as per the needs of the vehicle.

Here the Vehicle entering into or leaving the parking slot is controlled by an Android-based application.
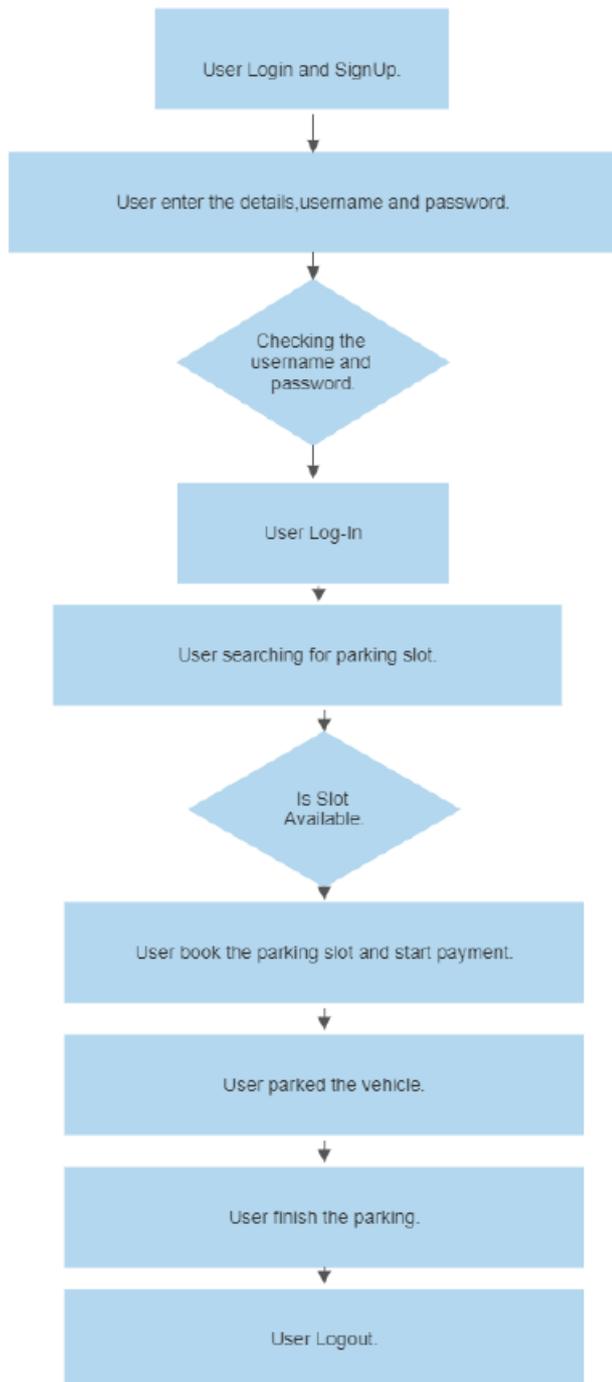
VI. SYSTEM ARCHITECTURE

Figure 1: System Architecture

VII. REQUIREMENTS VALIDATION

1. If the user wants to book the parking slots, then that user must register into the application.
2. The phone number asked in the registration must be numeric and must be of 10 digits.
3. Booking Id provided to user must be unique.
4. Email Id must contain "@".
5. The parking owner has to register himself into the application for adding the parking area and cost of slots into the application.

VIII. FUTURE ENHANCEMENT

1. Making the application more user-friendly and giving smoothly performance.
2. Enhancing our system and making it more suitable of doing the online payments through various platforms.

IX. CONCLUSION

Thus, the proposed system would be very advantageous and reliable to the users by providing them an ease of booking slots and doing parking. This application would be designed by keeping in mind all the functionalities that a better application must have. We are trying to make this application very simple and attractive so that every user can use this application without any difficulty.

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Citation of this Article:

Antas Tiwari, Deep Shah, Asif Patel, Avneet Kaur Saluja, "Smart Parking System" Published in *International Research Journal of Innovations in Engineering and Technology - IRJIET*, Volume 5, Issue 5, pp 25-28, May 2021. Article DOI https://doi.org/10.47001/IRJIET/2021.505005

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