# PARKING AGGREGATOR APPLICATION

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## ABSTRACT

Parking of vehicles has become a major issue in most of the urban areas due to the lack of parking areas. It's very much hard to find a parking lot in most of the high traffic areas, especially during our daily schedules. To solve such type of issues/problems we have proposed an application that provide a faster and easier way for reservation of parking slot. By the help of our application the user can see the various parking slots and also confirm whether any space or parking slots are available or occupied. Anytime if the parking space is empty then he can reserve the slot for a required time duration. Drivers have to wander around a number of times before they finally get a place to park.  Due to this problem it leads to high fuel use, polluted air, high risk of causing accidents. A system therefore, allows the drivers to search for the available parking places before driving to a high traffic area, takes care of the parking payment for exact time they have consumed, manages e-parking pass/ticket, and it is a right direction towards to overcome these difficulties.

## I.     INTRODUCTION

Due to increase in population, there has been an increase in the usage of vehicles. Searching for a car parking area in heavy traffic areas, has become hard for the drivers.

Mostly, wrong way of parking results in car damage and hence there arises a need for providing sufficient parking areas in hands with plenty of parking slots which would help maintain the user in parking his car safely. The smart parking application is one of the most high-rated growing solution of smart city. The existing car parking areas do not have a systematic planning and are managed manually but in an inefficient way.

Every driver/user's demand should have to be:

1. Efficient handling and user friendly

2. Should have nice performance.

3.  Proper security.

The idea behind our Android Application- is to help the users for booking or reserving their parking slots online. With the use of our application the user can select to view if parking slots are available or not. If any parking areas are available and slots are empty then the user can book the slots for the time duration required by the user. Our application also provides the user with the option for cancelling their bookings. Our system helps in solving various traffic problems.

## II.     LITERATURE SURVEY

Robin Gordi [1] has implemented that the motor vehicle will sort out in the specific assigned place. He has used Radio Frequency Identification sensors for identification of the vehicles. Once a car/bike is spotted, the application sends a message to the drivers or a parking area being engaged. The limitation is that it doesn't have GPS sensors so it can detect only close(nearby) places.

Alireza hassani[2] has executed it by connecting the mobile application and cloud together. The user or driver will be providing a time before booing the slot. If he fails to do it, he will get a message for it. The app will show the total number of available and unavailable spaces. The limitation is, if any user needs to book a assigned place he needs to wait for first user to cancel the place then only he/she can book it again.

Dharmini Kanteti [3] has made a Smart Parking System in the internet protocol cameras of the existing users captures the details of the car/bike. The total amount of booking will be deducted by the help of E-wallet and there by message will be provided to the users as a notification. The same price will be continued for new users but the option of the payment will be offline. The limitations are, that the application could reserve not beyond than 80 parking spaces it is the total limit.

Georgios Tamarisks[4] made the system  it by the help of the directly linking the sensor to the device that is receiving the input. There are two categories of these sensors as followed: -

1)Intrusive and 2) Non-intrusive sensors. Intrusive type is directly installed into the roads the connection can be done in both ways wired or wireless. Non-intrusive type installation is done with zero contact it is placed outside the pipeline. The limitation is, that these types of sensors require high installation charges.

## III. PROPOSED SYSTEM

In this project we shall be building an android based native application used for booking parking slots from various locations. The mobile application will have 3 types of users:

1. Users - Anyone who comes to the app to book a parking slot.
2. Parking Lot Owner - The person who owns/manages the parking lot.
3. Admin - The person who manages users and all configuration and settings of the system.

To make or develop a user friendly and adaptable system that can be implemented in a parking space to ease the parking problems.

To give a solution which reduces the travelling time, wandering time, traffic congestions in the high rush areas.

The proposed system should meet the following requirements:

**Slot Booking**:

**Step 1**: Firstly, the slot booking is done by the user from their own mobile phone. He checks for the availability of a parking spaces that is nearest to his location. If the slot is unoccupied, then he moves to the next stage or else returns to the starting area.

**Step 2**: Then it sends the request of parking slot from the mobile using Android application

**Step 3**: After the booking of a slot is confirmed by the user then the status of that same slot will be marked as OCCUPIED and the other slots will be UNOCCUPIED.

**Step 4**: When the user books the slot the system will generate total amount according to time per hours booked by the user.

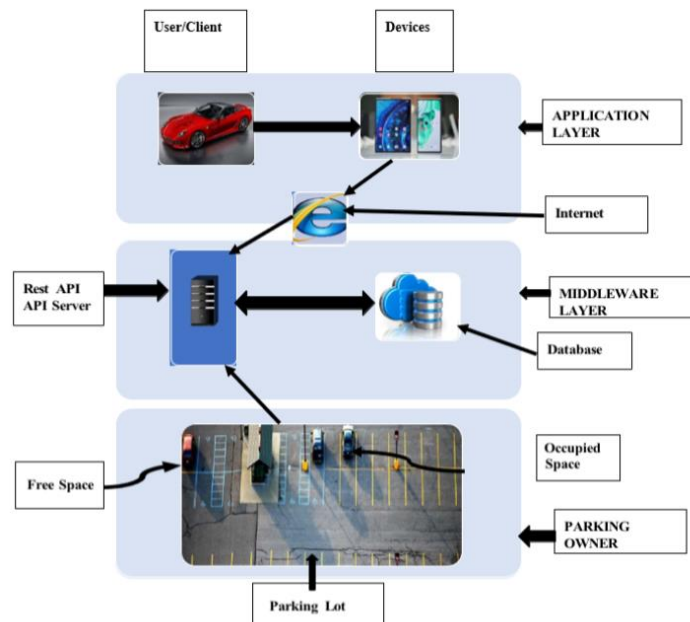**Step 5**: Lastly, he/she can generate receipts of the slot booked.



**Fig 1:** Architecture diagram of the system

### A. User's profile

Login and registration pages so users can register or login to their account.

**Search parking area:** By Selecting a location, users can view various parking areas and availability.

**Book parking lot**: The user has to provide the duration of the time for booking the lot as per availability which will be charged per hour. Then the user will be able to book a slot.

**View booking**: The user can see his confirmed booking details like user-id, number, username, time duration, mobile number and vehicle number.

**Cancel booking**: The user can also cancel his reserved slot. After cancellation the availability of the slot gets updated in the database.

**B. Parking Owner's Profile**

Login and registration pages so owners can register or login to their account.

**Add Slot**: The admin can add slots free and occupied in the parking lot.

**Authentication**: The owner can see all the details of the user. When the user comes into the parking area, the operator/owner verifies the details of the user, by using his car number and id number.

**Billing**: The owner can generate the bill by the help of the id. After the duration time gets completed, the owner interface will be updated automatically and the status of the parking lot will become available.

## IV.    IMPLEMENTATION OF PROTOTYPE

The prototype is developed on a 64-bit windows 10/ windows 11 OS (operating system) with 8GB RAM or more. Android Studio is used as development environment. Android Studio has an inbuilt support for firebase. In this project we have used Rest API for connection between the Android Studio and MySQL database on XAMPP Server.
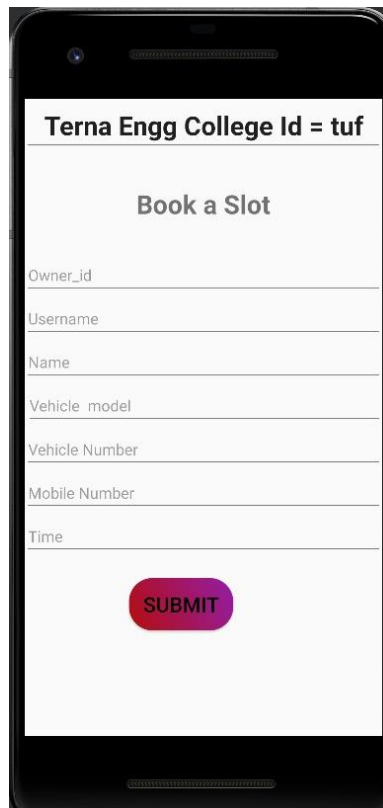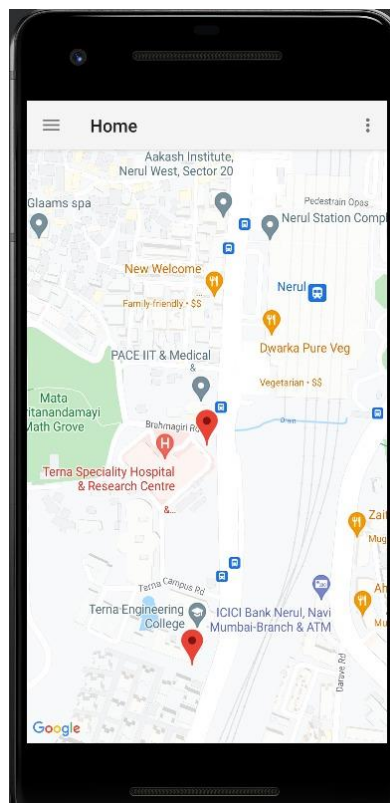
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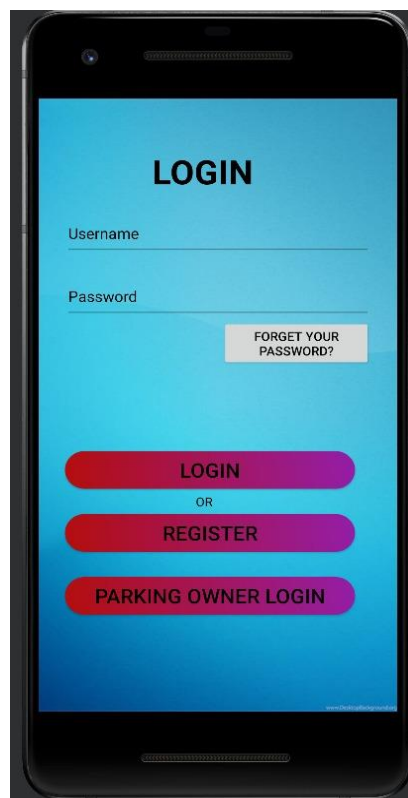
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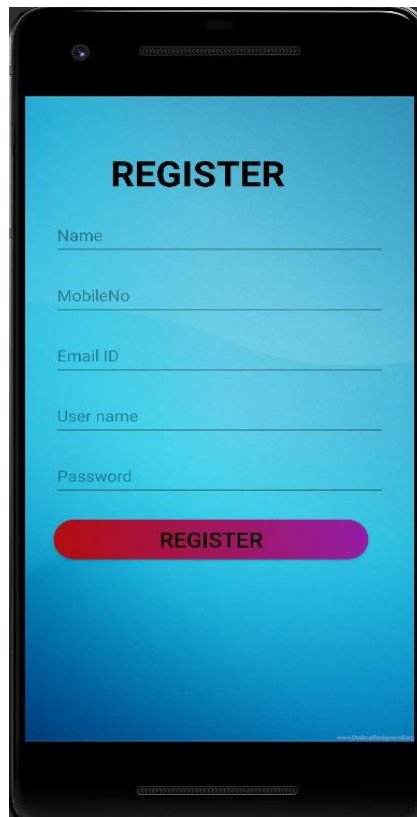


**Home Page (Map):**

**Booking Page:**



## V.    FUTURE SCOPE

There is a lot of future scope for our project. We can focus on integrating AI with our system and reduce manual labour which would be required for maintaining safety and security in the parking lots. The work of our application would not be limited only towards lot bookings but also should include the verification of vehicles and the users. Face recognition software, vehicle model and number detection and other security measures can also be added in the parking location. We can also include camera systems and real time monitoring which would help in detecting any anomalies in the parking location. Also increasing the locations available for parking might be a huge boon as it would be helping us increase our marketing and business strategies.

## VI.    CONCLUSION

In this project, we take into consideration the issues of the parking and present an android native parking app/system. By the help of this app, we provide information regarding to the total number of parking spaces available and unavailable. People from various urban areas or distant places could book a parking slot in advance only by the help of this application. The attempt we have made in this project is to provide the people with convenient and proper way to park their vehicles and also provide good parking facilities.

## VII.    ACKNOWLEDGEMENTS

This research work is the cumulative result of effort put in by the team members. Also, we would like to thank our guide, Prof. Ramesh Shahabade for guiding us throughout the project and helping us sail through the research work.

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