

PARK_ME

Smart Parking System

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Abstract- In recent times the concept of smart cities have gained great popularity. Consistent efforts are being made in the field of IoT in order to maximize the productivity and reliability of urban infrastructure. Problems such as, traffic congestion, limited car parking facilities and road safety are being addressed by IoT. So we present an android application for the parking system. The proposed Smart Parking system consists of an on-site deployment of an IoT module that is used to monitor and signalize the state of availability of each single parking space. The application allows an end user to check the availability of parking space and book a parking slot accordingly before the actual visit and pay the charges from the app wallet.

Keywords- Smart Parking, Smart City, IOT.

I. INTRODUCTION

The traditional parking systems such as multilevel or multi-storey car parking systems (no automated) robot car parking systems, automated multilevel car parking systems, etc. Have been implemented on a huge scale. But these systems have a major disadvantage of large space consumption which is successfully eliminated with the use of the “Automatic car parking system”.

In an automated car parking, the cars are left at the entrance and are further transported inside the building with mechanical structure. Similarly, they are retrieved by mechanical structure and placed at the exit for the owner to drive away. Our proposed system presents an Autonomous car parking that regulates the number of cars that can be parked in a given space at any given time based on parking space availability. When a car arrives at the entrance, it will be stopped at the main gate and the driver de-boards the car. If the availability of Parking space is confirmed, the user commands the car to get parked to the designated slot. The car traces its path to the entrance of the parking area. Here, it waits and the details required for parking of car at the proper slot are communicated to the Car Control Unit. On receiving the information, the car will further trace its path to free parking spot. On successful parking, the data on the LCD will be updated automatically.

II. RELATED WORK

Smart Parking based System for smarter cities:

As we all know that, India is getting motorized According to the report generated by Pune Municipal Corporation the city has more than 25 lakh registered two and four- wheelers, but has parking space for only 1,800 vehicles. It maintains just 16 off-street parking facilities across the city, which is woefully short considering an estimated two lakh vehicles are added to the tally every year. The same scenario can be currently seen in each and every metro city. Like this we have same scenarios in the different big and crowded metro cities like Mumbai, Delhi, Chennai, Bangalore etc. So finding the parking slot is like game of musical chair. Especially, it becomes more difficult when people have to pay hefty amounts for privately managed parking’s arranged in malls and shopping complexes. The other scenario is that people choose to park their vehicles on road which becomes uneasy for people walking on the roads and also there is more chances of the vehicles getting towed for illegal parking’s Hence, to encounter the above problem we have proposed an android application which will be helpful for the people to find their parking slots digitally. It will help people to find the parking nearest available parking slot based on the location. It will also direct the user to the allotted parking location. The charges of parking can be paid digitally or through vending machines. This application will be able to remove the stress of the vehicle owner and also the inconveniency that people faced everyday because of random parking on the roads.

III. THEORETICAL BACKGROUND

In everyday life, everything that involves travelling by car will involve parking somewhere. No matter what the purpose of the trip is, be it leisure or business, still someone will need a place where to leave the car. In every location and situation. On-street parking is mainly by default and may be subject to terms such as a payment, short time free parking or not allowed to park at all. These are called Parking restrictions (Driving School Manual 2010 73-82). Even though parking lots are monitored such that users must adhere to the rules, still monitoring methods are porous and give chances to

violation of the rules and regulations set by the governing bodies. Despite Finland having very strict driving training and rules, still many vehicle users violate rules. Why is this so? The following reasons show why people violate rules despite well translated parking rules and reasonable parking rates.

1. Lack of knowledge about parking places and parking rules. This mainly affects foreigners who know little about parking rules. As a matter of fact some users forget the rules with time.
2. Disobedience to the set rules. This is from users who just park anywhere provided that the place suits their need at that time and in case they are billed, they don't care, they just pay and business continues,
3. Unawareness of the rules and restrictions. This is because some restrictions change from time to time. It is common to find that certain area was free to park last year but now is subjected to a fee this year. Thus rules need to be transmitted to users via various ways.
4. Users who are in hurry so that they cannot wait to fulfil the parking obligations. These kinds of users exist; it means that someone is in a hurry for the service that they have no time to even read the parking instructions at the entrance to the parking area. To these people, the first priority is the service they are up to.

IV. SYSTEM ARCHITECTURE

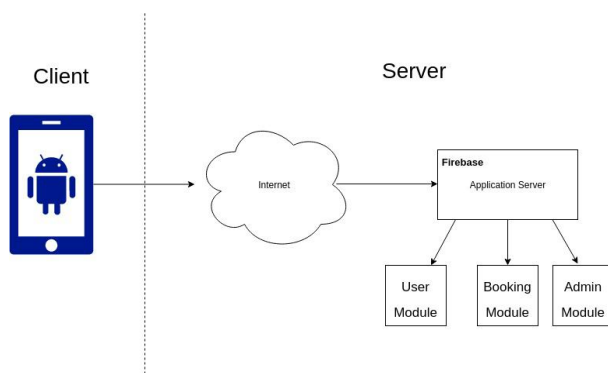


Fig. 1 System Architecture

The proposed system is an online parking booking system. Figure is presenting the system architecture of the proposed system. The proposed architecture has 3 core modules which is a base of the application which drives the whole system. The client can communicate to the parking servers using internet connectivity. The server used is a firebase real-time, the most obvious benefit of real-time data analytics is that there's no waiting. By integrating with data collection systems like CEMs or ERP, data can be captured at the source, processed, and visualized in the blink of an eye. The system has user module, booking module, admin module.

Modules

User Module

This module of the application deals with the user interface/user experience. This module provides the user with the flexibility of registering, logging in, booking and making the payment. If the user is new to the application then, the user must register in the application by providing the user's details. After the registration, the user logs in using the user-id and password. Once the user logs in, then the user browses the parking slot then books that parking slot followed by making the online payment.

Administrator Module

This is the operative module of the application. It works in the backend for managing the database and performs various operations on it. The administrator stores all the user's data in the database as soon as he gets registered with the application.

The administrator maintains the details of all parking slots (both empty and reserved), their price for booking, user details in a database and the modification on these data can only be done by the administrator. The administrator also provides the payment method to the user.

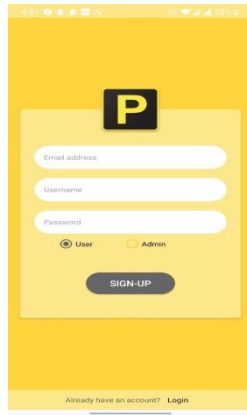
Booking Module

This is the main module of the application and it deals with the booking of the parking slot. When the user is ready for booking then the booking module comes in the scenario to provide the user with the necessary information for booking. The available slot cost to book the slot and the necessary processing in regards to these, are done by this booking module.

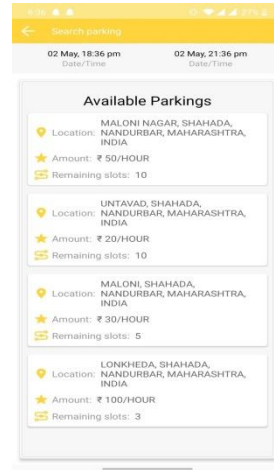
V. IMPLEMENTATION

The user needs to install the "PARK_ME" application on his android based device.

Registration /Sign-up: Initially, the user has to register his details with the application for the first time. This is a one-time registration. The user has to enter details like email-id, username and password. All this data is stored on server.



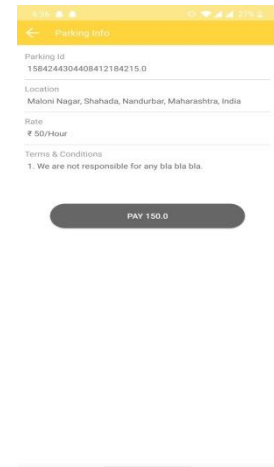
Login Screen: Once the user registers, he can use his username and password to login in future. This authenticates the user. Also, admin can login by selecting the admin option.



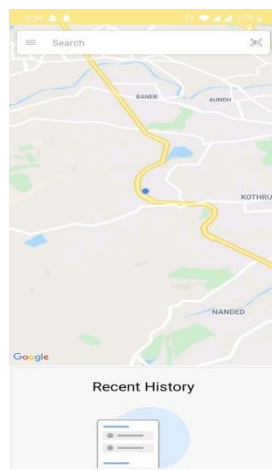
Book Parking: After book the parking, server gives parking information.



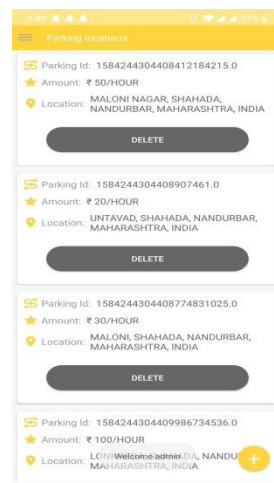
Dashboard: After login the application, dashboard will be flashed.



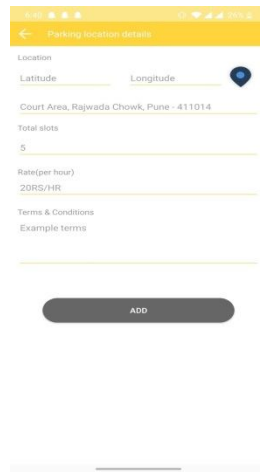
Admin Dashboard:



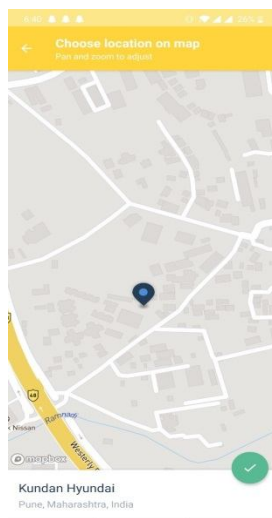
Search Parking: After login, we have to select the parking location or we can also search the parking's.



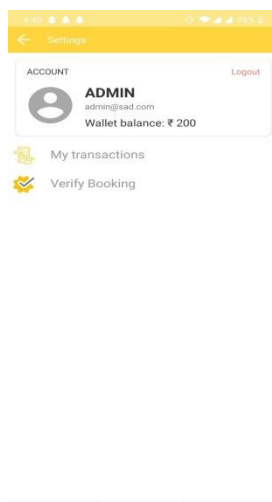
Add Parking: Admin can add the parking of users.



Parking selection to add:



Admin Settings:



VI. CONCLUSION AND FUTURE SCOPE

Conclusion:

The demand for the smart car parking system will continue to increase in the upcoming years. Though the smart parking system already exists, our project is aimed at making the system more cost-effective and user-friendly thus increasing its adoption in the market. The project was successful & cost-effective, user-friendly and had 90% accuracy. Future works will extend the system to administer 200 parking lots and incorporate other different technologies such as interlink with smartphones and GPS systems to increase its dependability.

Future Scope:

The “Park Me” Application can be developed for other popular mobile operating systems. In the future, our application can be implemented on the existing operating systems like iOS. Our application can be used as an alternative to the present parking systems in malls, at railway. The future of the smart parking system is expected to be significantly influenced by the arrival of automated vehicles (AVs). Several cities around the world are already beginning to trial self-parking vehicles, specialized AV parking lots, and robotic parking valets.

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