Implementation: Smart Parking System

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Abstract : *This paper is expected at creating a smart parking system that is more effective and user friendly than existing parking system. There are lot of parking related apps but all of them are dependent on some particular sever for providing parking space. Here we create a smart parking system application where user can also add the parking space by logging as a parking provider and book the parking by logging as a user. Parking issue is a big challenge to facilitate traffic network and ensure city life quality. Searching for parking space in most city area especially during the rush hour is difficult. For device the difficulty arises from not knowing where the parking space is available. This paper presents a review of various techniques which are already implemented to solve the parking issue.This paper also presents a mechanism to solve the issues. The aim of this project is to provide a user friendly reliable parking system application. Smart parking system typically acquires information about availability of parking space in nearby area and process real time data to place vehicle at available position.Smart parking system uses mobile application for automated mobile payments. Smart parking system is useful to solve the issue of parking traffic congestion .*
Keywords : *User Module ,Parking Space Module ,Real Time Data Module ,Booking Module ,Bill Generation And Payment module.*

I.   Introduction

Smart Parking technologies are designed with ease of maintenance in mind. The concept of internet of things with identity communication device such as mobile. Parking issue is a big challenge to facilitate traffic network and ensure urban life quality. Searching for parking space in most metropolitan area especially during the rush hour is difficult   for device the difficulty Aries from not knowing where the availability of parking space availability of parking space. Smart parking system provide easy way of parking using mobile application. Smart parking is a solution for smart cities of the future. The efficient management of parking and traffic. About available parking spaces in particular geographic area and process is real-time   data to process   vehicles at available positions. It involves using low-cost sensors, Real-time data collection, and mobile-phone-enabled automated payment systems that allow people for digital payment using google pay or phone pay like application. The smart parking system that we created is implemented using a mobile application that is connected to the cloud .The system help user to find the availability of the parking space and price of parking per hour, user can book the parking by just one click on the book button and cancel the booking by using cancel button and one other feature is added that user can also work as server by login as an parking provider and add the parking where he want to add and he also can remove the parking by using delete button ,after parking the car /bike payment should be done by using the credit card as soon as as you click on the book button your time start ,and accordingly bill is generated . user module : Most app needs to know the identity of the user Knowing   the user's identity allows an app to securely save user data in the cloud and provide the same personalized experience across all of the user's devices .Firebase Authentication provides backend services ,easy –to-use SDKs, and ready-made UI libraries to Authentication using passwords, phone number **,**popular federated identity providers like Google**,** Facebook and Twitter , and more. Firebase authentication integrates tightly with other firebase services , and it leveraged industry standards like o Auth 2.0 and opened ID connect ,so it can be *easily*

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Figure: 1.1 : Firebase

integrated with your custom backend . To sign a user into your app , you first get authentication credential from the user .This credential can be the users email address and password ,or an O Auth token from a federated identity provider. Then, you pass these credentials to the Firebase Authentication SDK. Our backend services will then verify those credentials and return a response to the client. After a successful sign in can access the user's basic profile information, and you can control the users access to data stored in other Firebase products . you can also use the provide authentication token to verify the identity of users in your own backend service. Parking space module : store and sync data with our NoSQL cloud databases. Data is synced across all clients in real-time, and remains available when your app goes offline . The firebase real –time Database is a cloud-hosted database. Data is stored ass JSON and synchronized in real-time to every connected client . when you build cross –platform apps with our IOS , Android , and java script SDKs all of your client share one real time database instance and automatically receives update with the newest data. The Firebase Real-time Database lets you build rich, collaborative applications by allowing secure access to the database directly from client side code. Data is persisted locally ,and even while offline ,real time events continue to fire ,giving the end user a responsive experience .when the device regains connection .The real time database synchronize the local data changes with the remote updates that occurred while the client was offline ,merging any conflict automatically. The real time Database provides a flexible ,expression based rules language ,called Firebase real time security rules ,to define how your data should be structured and when data can be real from or written to .When integrated with Firebase Authentication ,developers can define who has access to what data ,and how they can access it. The real time database is a NoSQL database and as such as a different optimization and functionality compare to a relational database .The real time database API is designed to only allow operations that can be executed quickly .This enable you to build a great real time experience that can serve millions of user without compromising on responsiveness .Because of this, it is important to think about how users need to access your data and then structured it accordingly .Routing module OSRM server can be used as a library(libosrm) via C++ instants of using it through the HTTP interface and osrm-routed .This allows for fine –tuning OSRM and has much less overhead .OSRM is the main Routing Machine type with function such as Route and table You initialize it with a Engineconfig . it does all the heavy lifting for you .each function takes its own parameters ,e.g. the route function takes route parameters, and a out- reference to a JSON result that get field ,The return value is a status ,indicating error or success.

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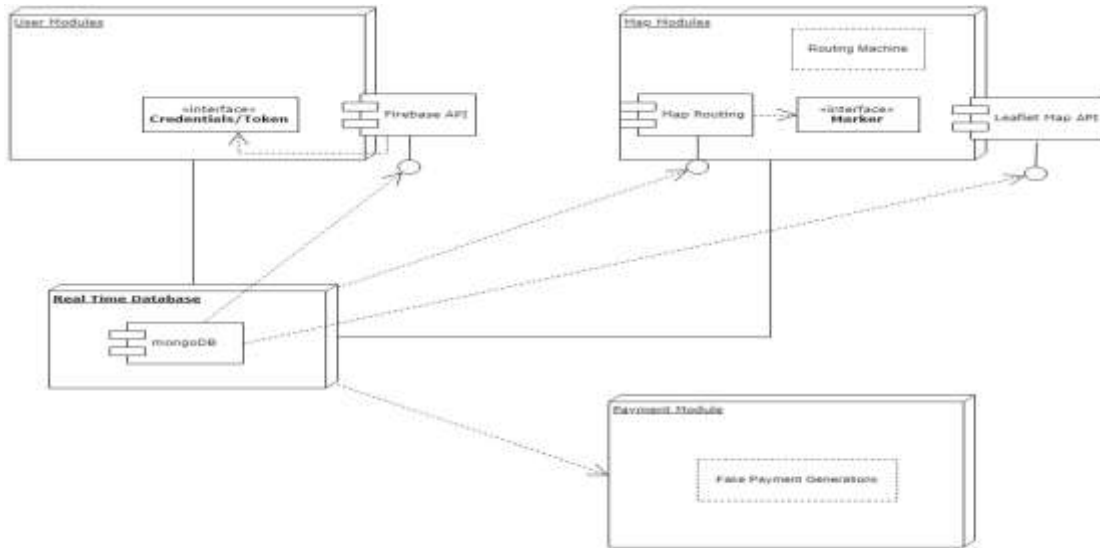
II.   Flowchart

Figure:2.1 data flow diagram

III.   Implementation

We created an application mobile application which shows the availability of parking spaces and using that we can easily find the parking space in near by area and book it accordingly . The main advantage of this system that it is not depend on server for adding the parking ,anyone who want to add the parking on particular area he can add by login the application as parking provider .

Below are the steps that a driver needs to fallow in order to park its car using our smart parking app.

* STEP1:Install the smart parking app on your mobile .
* STEP2: (a) Login yourself as user or as parking provider .if you login as parking provider   you get an authority to add delete or remove parking.

1)   Click on + sign to add parking .and add the parking on particular   area.
2)   After that you can delete or add parking accordingly.

(b) Login yourself as user you can book the available parking .
1) Select parking area from available parking .
2) Click on book button and book the parking when you click on book button you get all the information related to parking space like cost , available parking spaces , parking name etc .
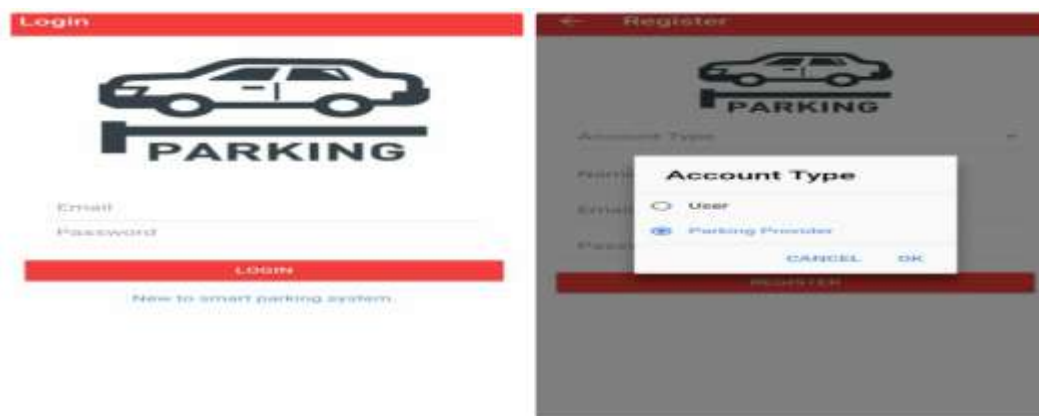

Figure 3.1   Login page, person login as parking provider

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Figure :3.2 Select a particular area where you have to add a parking

When a person login as parking provider he has an authority to add the parking on particular area where he wants to add the parking. After adding the parking on particular area he also can delete the parking or he can add delete or edit the parking space .parking provider add the parking with details like parking name , total space , remaining parking space ,and cost per hours.
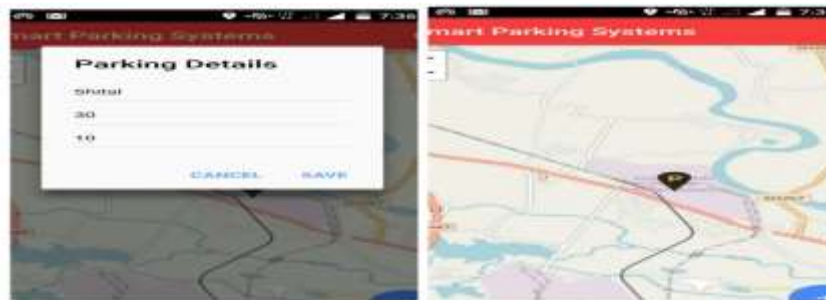

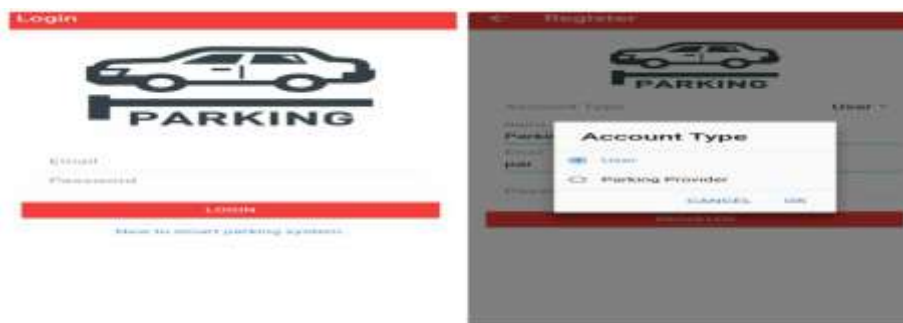**Figure 3.3** Page showing parking details and parking space on a map

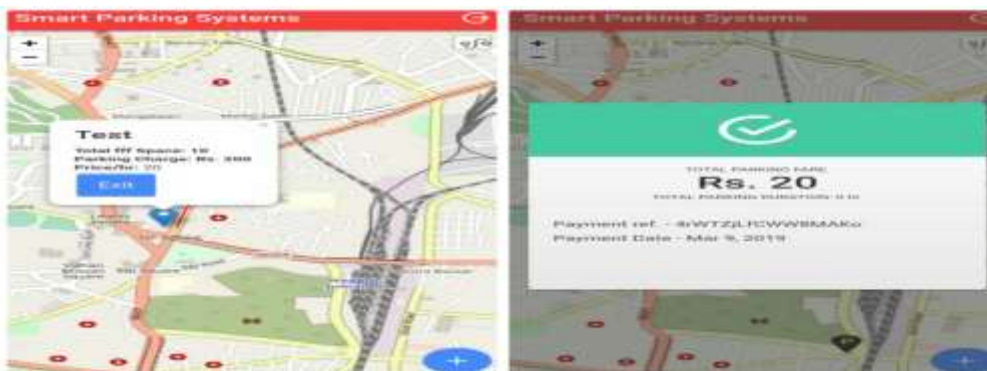
Figure 3.4 Login page ,person login as user

Figure 3.5 User can see the parking space and book according to their comfort and the pay for it using any kind of online payment system .

IV.   Conclusion

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In this paper The system that we propose provides real time information about the availability of parking space in parking area .User from any location could book a parking space by using their mobile application. The effort made in this paper are going to improve the parking facilities of city and thereby aiming to enhance the quality of its people.

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