CAR PARKING SYSTEM BASED ON VOICE RECOGNITION

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Abstract

The study in this article guides us to the depth knowledge on android fundamentals for developing an application to park the car in vacant slot of a parking area. The core concepts behind the emerging technology which allows user to book the free slot on the specific arrival time .This article provides a vision of an App on android, which is essentially a Car Parking app in which passenger certainly needs to login first by giving information, the whole application would make it easy for individuals with several API use for voice instruction in Hindi or English on Smartphone to reserve their parking space based on the availability.

1. Introduction

With the passage of time, technology gradually increases to ensure comfort in everyday life. The transport and reservation network is growing because of people's needs. Several modes of transport are available, but parking is still a major issue in urban cities around the world. [1]. People stay in queue too long to park their vehicle. Advanced online parking system is a application to provide an easy way in finding or analyze the free slot to park their vehicles. Advanced online parking system allows users to pre-book a slot in the area they desire, if available, before their expected arrival. This will help to drastically reduce the burden on his / her physical work and user can quickly check the parking space [2].

Parking services plays a vital role in urban transportation system. The most challenge of this system is the mismatch of passenger parking space demand .It is difficult for passenger to get park their vehicle on time and mostly vacant space waste too much time of passenger for finding which cause traffic blockage [3].

A new interface is introduced among the common people to resolve this issue in order to efficiently use the perfect combination of their Smartphone and the internet to park a vehicle.. The convenience of booking vehicles from everywhere has rendered this business model a big success [4].

Parking reservation app is a recent innovation that has positive effects on trouble-free parking with various services. The infra red nodes senses the car space and transfer the information to the server. The application fetches the data from the server and gives the real time update regarding the available parking slots. The user can check for empty vehicle slots, in turn it reduces the time consumption and efforts put by any user to find parking space by going and doing it physically [5]. User will be provided with an interactive user interface for the process of pre-booking of parking slot. User requests the server for locations where parking is available and the server responds with slots availability.

The designed application named ParkCar also comes with the functionalities like the data analytics for the parking owner and with all the objective guidelines covered so that the user the parking owner will get all the benefits of the application and reduce the problems faced by the users to find the parking slots and same as for the paring owns to keep the real time track of the all the parking slots that whether they are empty or whether they have been occupied [5].

The online payment gateway makes it easier to commit the transactions on real-time. The purpose of this study is to develop a digital car parking app that support voice recognition to give its users greater ease. With the introduction in section-1 the rest of the paper is categorized: In section 2 the analysis of old system. Development of proposed system is done in section-3. Throughout section 4 we analyze this system's architecture modules. Implementation of mobile application is performed in section-5, and this paper is concluded in section-6.

2. Review of Existing System

Online parking system already exists in many forms, it's been available already in form of many websites and many apps also. None of the existing system is up to the mark because of the inaccurate data set collection and database maintainability. The system lacks with the correct information and proper real time updates [7].

Many of the Brazilian companies like ParkCar have already been introduced in their parking management system but it didn't have any such good response. It took about 10 years of growth and deployment to make it too convenient to handle parking. They have given different options and criteria for customizing billing, recurring clients, partnerships and much more.

3. Proposed System

In this paper we proposed a system which is an attempt to build a mobile application which is user friendly. We noticed that the already existing software doesn't fulfill the need of the user properly and the application doesn't provide the data analytics and the application was totally working on the native parking spaces and not will all the available parking space. The second thing is the old system did not provide an occupancy rate for live parking spaces in real time because it didn't use the IR sensors to detect the slots ' current occupancy status.

The sensors will track the presence of the vehicle on the spot. If a vehicle would be present on the slot then the sensor will automatically set the slot flag to true i.e. the slot is already been occupied by the slot, and when the vehicle will not be present on the spot then the sensor will automatically set the value of flag to false i.e. the vehicle is not present at that spot. The parker can be implemented as a project which will operate on as many as parking slots as possible without owning any one of them. The Application will use the geographic location to determine the current location of the user and suggest the user about the parking locations available nearby the entered location [3].

Each and every parking will have to maintain their parking space as there is functionality rating the parking area is been provided. The user using the application can simply rate the services provided by the parking space and the other user will be able to see the average rating and individual rating of each and every parking space. There is a section in which you can already see the pictures of the parking space which is been already uploaded by the parking space owner and along with that the list of the services which will be provided if a user will use that parking space. The each and every parking is provided with a unique id and same is the case with the parking slots. Each and every parking space and parking slot is uniquely identified so that further more information could be processed using it. The parking owner will also get a control console unit that will be in form of a tablet. In that tab the individual will be able to control all the operations of the parking space. The parking operational head will be able to check in and check out all the incoming vehicles and outgoing vehicles[4]. A separate record is been made for the parking owner so that it could maintain the information stack of all the services which is been provided by customer.

Working Model:

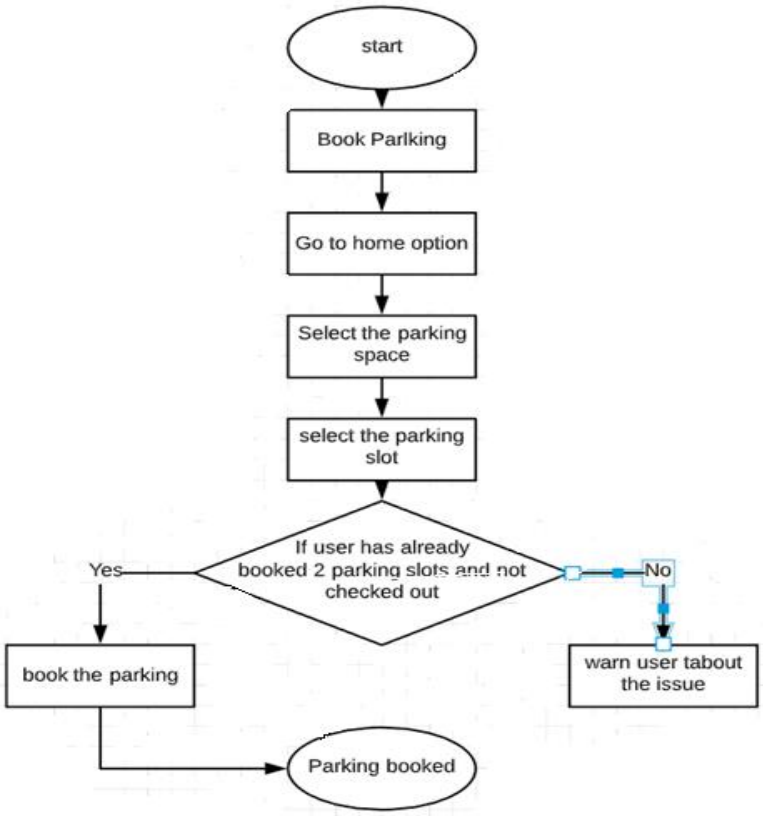

Fig 1.1:-ParkCar Flow Diagram

This model is the working example for the program we propose. The sensors will track the presence of the vehicle on the spot. If a vehicle would be present on the slot then the sensor will automatically set the slot flag to true i.e. the slot is already been occupied by the slot, and when the vehicle will not be present on the spot then the sensor will automatically set the flag to false i.e. the vehicle is not present at that spot. The parker can be implemented as a project which will operate on as many as parking slots as possible without owning any one of them. The Application will use the geographic location to determine the current location of the user and suggest the user about the parking locations available nearby the entered location.

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4. Comparative Analysis

To ensure that the mobile application we are creating is unique from the present system addressed in section 2, we need to compare our application with the existing parking slot booking applications. The evaluation parameters are as follows:

1. Requires user registration before using application.
2. Whether application uses Google maps services or not.
3. Payment integration is available or not.
4. IR Sensor for real life implementation.
5. Voice recognition feature is available or not.

Criteria	(Just Park Parking App) Reference 1	(Parkify) Reference 2	(Parkeopidea)Reference 4	(The PArkingSpot) Reference 7	(ParkWhiz) Reference 9	Park Car
Require registration to use	Yes	Yes	Yes	Yes	Yes	Yes
Works with google maps	Yes	Yes	Yes	Yes	Yes	Yes
Payment integration	Yes	No	Yes	Yes	Yes	Yes
IR Sensors	No	No	No	No	No	Yes
Voice recognition to control app	No	No	No	No	No	Yes

TABLE 1: A comparative analysis with other application on parking slot reservation for car.

We have observed from table that every mobile application needs registration for its use. Every other taxi booking application uses Google Maps services to access the users ' current location. In addition, our application includes similar features that other applications have, but voice recognition and manual driver selection are not available in other applications. With IR and voice recognition feature is the one in our application which makes it different from other applications.

5. DESIGN MODULES:

Getting the location Service

To get the location service. Application will ask for the location service permission now set the application to use the location service for real world implementation.

Speech to text

ParkCar uses a speech to text feature that recognizes the language and reaction of humans in the same way. It can get the actor to answer and write down what the actor said. We do have restrictions on limited words which it utilizes to perform tasks [7].

Live Map Tracking

We also use IR sensors and live map monitoring to check the free parking slot on the destination because we need to make sure that no deadlock will get created for our users so to get the current active status of all the parking slots .The IR sensors will detect the current status. The sensors mapped into the parking spots will set the data and the current active status of the parking slots will be fletched.

Location Accuracy
We also use certain algorithms and APIs that help us extract only the location from the user's voice command.

Database System
Using the Firebase Database to store all the data into it. User driven input will be taken and application will save all the data into the firebase. The application will save all the data into the firebase.

Booking Slot
Enabling user to check in after booking on reaching the area and check out at the time of leaving. Check in service available for the payable service. The manager will manage the check in and checkout service manually. The record of the vehicles checked in and checked out is maintained.

Feedback System

User has the option to view and provide the rating. User can view their current ratings, average ratings, number of reviews and the reviews. The already saved data from the firebase. The application will process and set all the required data. The current rating, average rating, number of reviews and the reviews will be displayed and if users wish to provide its own feedback he/she can fill the survey form.

5. Implementation of the Mobile App.

Project implementation basically targets the locations where the people face difficult to find a parking space when needed and the owners of the parking for the better management The project cloud be simply implemented with a proper business plan in which the owner of the application will own as many parking but none of them will be his owns. The main profit will be generated by the online advanced bookings.

There will be some set of regulations which each and user will have to follow. If a user will book a slot then he has to check into the parking under 2 hours otherwise the booking will be invalidated. The cost of advanced booking will be more than the regular booking as the space is been reserved for you in advanced and rest of the incoming invoices were rejected. Once the user is not able to check in under given time slot then his booking will be cancelled and the slot will be allotted to some other user and 80% of the amount paid will be deducted.

6. Conclusion

This study has shown the importance of making such app for the comfort of users. It makes parking booking with time selection for check in/check out makes more convenient to everyone. To conclude, the outcomes of this study show that to satisfy users, app must be easy to use and meet their expectations with new ideas. This app will satisfy its users with its performance, efficiency and ease of use. Furthermore, to improve number of users, the service providers must pay attention towards user's need. Moreover, in future we focus on how to integrate maximum functionality controlled through voice and try to introduce voice recognition with other languages.

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