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Android Application for Vehicle Parking System:

"Park Me"

Lalitha Iyer
Thakur College of Engg. & Technology, (TCET), Mumbai, India.
lalitha065@gmail.com

Manali Tare
Thakur College of Engg. & Technology, (TCET), Mumbai, India.
manali.tare13@gmail.com

Renu Yadav
Thakur College of Engg. & Technology, (TCET), Mumbai, India.
renuyadav888@gmail.com

Hetal Amrutia
[Assistant Professor]
Thakur College of Engg. & Technology, (TCET),Mumbai, India.
hetal.mecs@gmail.com

ABSTRACT

The number of personal vehicles usage is increasing manifold. People prefer personal vehicles to commute than depend on public transportation. Finding a parking space in most metropolitan areas, especially during the rush hours, is difficult for drivers. Due to this there is a need to provide sufficient parking places coupled with plenty of slots to help the user park his vehicle safely, also to ensure the user does not end up parking on non-parking area and cause discomfort to pedestrian. The idea behind our Android Application-"Park Me" is to help the user analyse area's where parking is available and number of slots free in that area. Additionally, four hours prior to his expected arrival, the user can pre-book a slot in the area he desires if it is available. This will help reduce the load on the administrator as his physical work reduces drastically and user can search the parking slot through Android Application. Payment services are made available using Google Wallet, so the user is required to own a credit card or debit card. "Park Me" Application relieves the user from the hassle of manually searching and waiting for empty slots to park the vehicle.

Keywords-Application (App); Dalvik Virtual Machine (DVM); Google Wallet; International Mobile Station Equipment Identity (IMEI)

1. INTRODUCTION

Android is an operating system, developed for mobile devices like Smartphone's and tablet computer, which is based on Linux operating system. It was developed by Google in the year 2005. It is the Smartphone platform. Within the last couple of years an expansive process has begun to emerge integrating computational logic into various kinds of objects of our everyday life and allowing us to persistently interact with those objects. The idea is to thoroughly connect virtual information to objects of the physical world and thus providing ubiquitous computing. Related to the concept of network ubiquity is the term 'Internet of Things' referring to objects of daily use being identifiable, track able and even virtually connected via an internet-like structure. With the rapid proliferation of vehicle availability and usage in recent years, finding a vacant car parking space is becoming more and more difficult, resulting in a number of practical conflicts. Parking problems are becoming ubiquitous and ever growing at an alarming rate in every major city. Wide usage of android technology with the recent advances in wireless applications for parking, manifests that digital data dissemination could be the key to solve emerging parking problems. Now-a-days there

is a steady increase in the number of people using Android mobile phones. This paper proposes a Smart Parking System based on android technology for avoiding the parking problems which provides process of pre-booking the slots through the use of a simple and interactive Android application. This application is expected to provide an efficient and cost-effective solution to the effluent vehicle parking problems. The paper describes the overall system architecture of our application. The user needs to have an Android enabled device to reap the benefits of this application. After installing the "Park Me" app, user needs to mandatorily register with the application. Booking of the slot at user's desired location should be done four hours prior to the arrival. Payment services are made available using Google Wallet in the future, so the user is required to own a credit card or debit card. Penalty will be levied on late arrival as well as on over use of the slot after user specified entry and exit time. The places where security surveillance (CCTVs) is made available will be used by the administrator to keep a track of the vacant or occupied slots. Else, physical presence of the administrator at the slot site will be required. During reservation process the client needs to provide with details that includes booking person's name, vehicle number, expected entry and exit time.

2. MOTIVATION

2.1 Existing Scenario

2.1.1Wireless Sensor Network Parking (WSN)

In these system Infrared (IR) sensor nodes senses the status of the car space and transfers the information to a controller. It thereby displays the information on a LED screen with which the user can check for empty vehicle slots, in turn reducing his time. As infrared cannot penetrate walls, therefore it cannot be used in closed parking areas due to low wavelength. (E.g. shopping malls or residential area where parking is done in enclosed area).6.3[6], 6.3[7]

2.1.2 Multi-Storey Parking

A multi-storey car-park is a building designed for car parking and where there are a number of floors or levels on which parking takes place. It is essentially a stacked car park. The earliest known multi-storey car park was built in 1918 for the Hotel La Salle at 215 West Washington Street in the West Loop area of downtown Chicago, Illinois. 6.3[8]

2.2 Ideology behind our application

"Park Me" application is based on the client-server architecture. The client is provided with an interactive Android based user interface for the process of pre-booking of parking slot. The server side processing will be enabled using PHP and MySQL. The client requests the server for locations where parking is available and the server responds with slots availability.

Figure 1: Client-Server Architecture of "Park Me" application

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3. IMPLEMENTATION

3.1 Client Side

3.1.1 Starting the application

The user needs to install the "Park Me" application on his Android based device. After installation, the icon of the app will feature on the Home Screen of the user's device. "Park Me" welcome screen will be flashed to the user on opening the application.

Figure 2: Splash Screen

3.1.2 Registration

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 username, gender, phone number and email-id. All this data will be stored on server. Booking for slots mandatorily has to be done four hours prior to arrival.

3.1.3 Login

Once the user register's, he can use his email id and phone number to login in future. This authenticates the user.

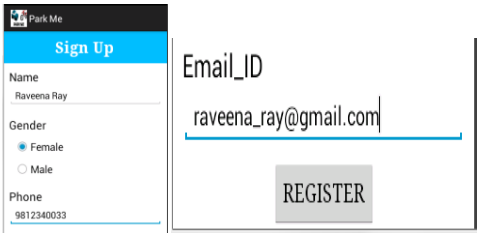


Figure 3: Client Registration

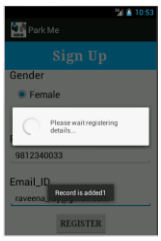


Figure 3.1: Saving client registration details into server

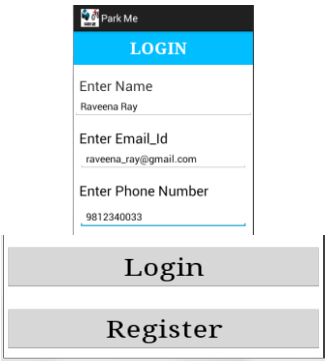
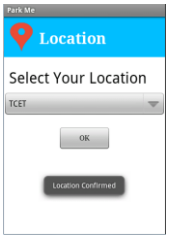


Figure 4: Client Login

3.1.4 Selection of location for parking

The client is provided with multiple parking locations. Client has to select one of the locations provided where he desires to park the vehicle.



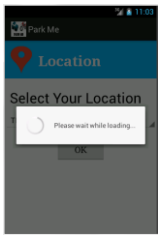


Figure 5: Selection of Location

3.1.5 Select vehicle type

After selecting the location, options for the vehicle type is provided i.e. 2-wheeler or 4-

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wheeler alongside the rate chart for parking charges is prompted.

Figure 6: Vehicle Type

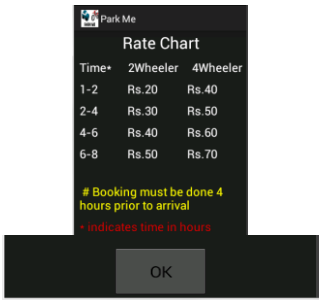

Figure 7: Rate Chart

3.1.6 Availability status of the slots

Based on the type of vehicle selected availability of the empty slots will be displayed along with the total slots reserved for that vehicle type. Colour coding is used to indicate empty v/s reserved slots. Green indicates empty slots and Red indicates that currently there are no empty slots for reservation.

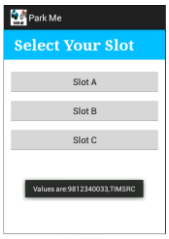

Figure 8: Slot Availability

3.1.7 Enter user's details for slot reservation

In case the slot is available, the client can proceed further with the reservation process or else he can go back to change the location/vehicle type or else can terminate the entire process.

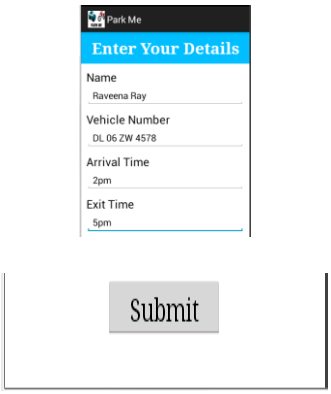

Figure 9: Enter Details to book slot

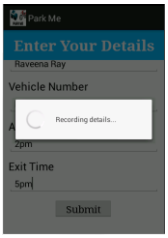

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Figure 9.1: Saving Enter Details data into server

3.1.8 Confirmation

On successful reservation, a confirmation page with user details is shown which is editable.

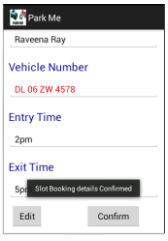

Figure 10: Confirmation Screen

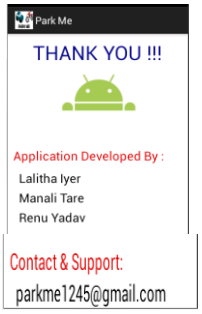

Figure 11: App details page

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3.2 Server Side

The server side processing will be enabled using PHP and MySQL. The administrator has to register his details with the server side application. This is also one time registration and can make use of his username and password to login in future. Whenever a new user registers with the application, the record will be stored in the server side database. When the registered user selects the location and vehicle type, immediately server receives the client's request. After receiving the request for the desired location, server processes the related information and responds accordingly. Furthermore, the administrator has direct option to view user details and slot details stored on the server direct via the application.

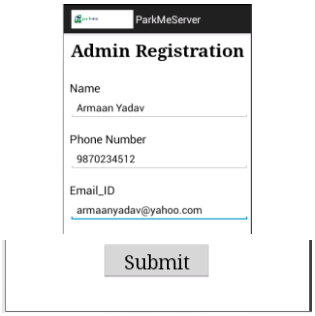

Figure 12: Admin Registration

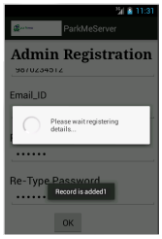

Figure 12.1:

Saving Admin details into server

Figure 13: Admin Login

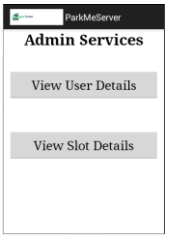

Figure 14: Client data that admin can choose to view

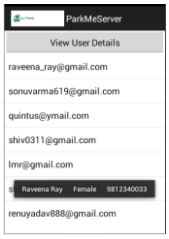

Figure 15: View User Details

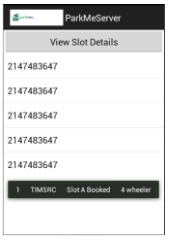

Figure 16: View Slot Detai

4. FUTURE SCOPE

The "Park Me" Application can be developed for other popular mobile operating systems. In future, our application can be implemented on the existing operating systems like iOS, Windows and BlackBerry also on the upcoming and promising operating systems like Firefox OS, Jolla and Tizen. Our application can be used as an alternative to the present parking systems in malls, at railway

stations, near airports, theatres, etc. as an efficient means to park. Google Wallet can used to make secure payments fast and convenient.

5. CONCLUSION

If it is a dwelling, entertainment centre or a market place, the first and foremost question in the minds of everyone is about the parking slot. Compared to other developed countries, the problem of parking is disheartening in India as there is no well devised plan in place. There is a wide gap and total mismatch between the production of vehicles and the parking slots. Government authorities have been raking their brains day in and day out to tackle this problem. The parking problem is quite acute in places of entertainment such as theatres and shopping malls. We touched a small scenario of parking problem in India in this paper. We brought out in this paper how the parking problem in such places can be tackled with a well-thought plan. The plan helps both the visitors and administrators. It helps the visitors in finding out the availability of a parking slot, get the availability confirmed, and reach the place within the time slot allotted. It helps the administration to allocate the vacant slot to the next person in queue. A well thought parking plan saves the time of visitors in booking a parking slot in advance and the administration to allocate the vacant slot in a methodical and organized manner.

6. REFERENCES

6.1 Journal References

[1] M. Fengsheng Yang, Android Application Development Revelation, China Machine Press, 2010, 1

[2] M. Zhengguo Hu, Jian Wu, Zhenggong Deng,Programming Methodology, National Defence Industry Press, 2008, 6

[3] M. Junmin Ye, Software Engineering, Tsinghua University Press, 2006, 6

[4] J. Dongjiu Geng, Yue Suo, Yu Chen, Jun Wen, Yongqing Lu, Remote Access and Control System Based on Android Mobil Phone, vol.2. Journal of Computer Applications, 2011, pp. 560-562

[5] J. Li Lin, Changwei Zou, Research on Cloud Computing Based on Android Platform, vol.11. Software Guide, 2010, pp.137-139

[6] J. Wolff, T. Heuer, H. Gao, M. Weinmann, S. Voit and U. Hartmann, "Parking monitor system based on magnetic field sensors," in Proc. IEEE Conf. Intelligent Transportation Systems, Toronto, 2006, pp. 1275-1279.

[7] Kurogo, H., K.Takada and H.Akiyama, 1995. Proceedings of Vehicle navigation and System Information Conference 1995. In conjunction with the pacific Rim TransTech Conference.6

[8] C.Laugier and F.Thierry, "Sensor-based control architecture for a car-like vehicle." Proceedings of IEEE/RSJ International Conference on Intelligent Robots and Systems, Volume 1, pages 216-222, 1998.

6.2 Book References

[1]Wei-Meng Lee :Beginning Android 4 Application Development

[2]Retro Meier: Professional Android 4 Application Development

6.3 Web References

[1]http://www.intranse.in/its1/sites/default/files/D1-S4-02_Intelligent%20Parking Implementation%20Challeges_0.pdf

[2] http://www.sybernautix.com/anprparkingsystem.asp.

[3] http://ieeexplore.ieee.org/xpl/articleDetails.jsp?reload=true&arnumber=6320742&sortType%3Dasc_p_Sequence%26filter%3DAND(p_IS_Number%3A6320721)

[4]http://undergraduateresearch.ucdavis.edu/urcConf/write.html

[5]http://jpinfotech.blogspot.in/2013/08/meetyou-social- networking-on-android.html

[6]http://www.slideshare.net/maverickadhar/multi- level-car-parking-in-india

[7]http://www.gobookee.org/ieee-paper-for-automatic-car-parking

[8]http://www.ijsrp.org/research-paper-1012/ijsrp-p1007.pdf