

Intelligent Parking System

Vijay Jumb^{#1}, Michael Pinto^{*2}, Vinstan Lewis^{#3}, Hansie George^{*4}, Soham Ghosh^{#5}

¹Assistant Professor,^{2,3,4,5}Students

[#]Computer Engineering, University of Mumbai

¹vijay.j@xavierengg.com

²pintomichael11403@gmail.com

³vinstanchurchill@gmail.com

⁴hansiegeorge7@gmail.com

⁵soham.ghosh.58@gmail.com

Abstract— Normally people are mostly stressed out about where to park. As the number of vehicles are increasing but the parking areas are limited. To eliminate this stress, we have come up with a system for a specific location, which will make the users aware of the slots available for parking. Intelligent Parking System gives the conventional method of pay and park at a specific location, as it saves waiting in long queues and saves their time. This will also reduce the workload on the car attendant. This can be achieved by making a system which can be accessed from both sides the car attendant and the customer. The customer will have to choose from the slots available to them. Once the slot is booked, the slot image will turn red that is it is reserved and if the slot is available it will remain green. The reserved slot will be held for a predefined period from the time of reservation. A penalty system is implemented for fair reservation. The car attendant also has the right to reserve a slot depending on availability as there may be customers who has not reserved the slot using the application. The car attendant can block the slot from his system and collect the cash directly from the customer. The customer will get a notification on their android application mentioning the slot number. The car attendant will get the chart with the car number so that he can verify if the car has arrived. To achieve this, we will be using an android application. The android application will be using firebase to manage the database of the system.

Keywords—Android, Intelligent Parking, slot, payment, Intelligent Parking Database

I. INTRODUCTION

Searching for street parking in crowded urban areas creates many problems and frustrations for drivers. Over the past 5 years, the number of vehicles in Mumbai has grown from 2 million to 3 million that is 50 of the total number of cars in Mumbai according to The Times Of India.[4] The increasing number of private vehicles has led to queues at places, which have the old ‘on-the-spot parking system’. In Intelligent Parking System, we have tried to make the present manual parking system digital rather than having to pay at the security booth and then park. To counter the stress of having to search for a parking slot, we have included a feature where the customer can book the slot 15 minutes before parking at the slot. Here the customer can also select from the slots available and can easily park at the slot he/she has booked. This will save the customers time and effort for searching for a slot to park. Here the customer for the duration of the slot online. The existing system is a manual system where only on-the-spot parking is available, which will lead to long queues and a lot of waste in the customers time. As it is mandatory for the customer to pay for the slot on the spot, it will require time for the transaction to take place which will create unrest in the customers as they will be wait for their turn in the queues. In this system there is no obsolete record of the money earned which would make it difficult to keep a track of the payment. This system would require us to take care of the physical tickets that are provided at the security booths as they are the only proof the customer has of paying for the slot.

II. RELATED WORK

In “Development of an Android Application for Smart Parking System” Hina C. Parmar, Nisha N. Shirvi uses a method in which latitude and longitudes are used for smart parking. Here after booking the slots, two things would be found out, the user’s current latitude and longitude points and with the help of this points the functional circle with a radius of 2 meters will appear on the map. The user will have to reach the parking in 30 minutes after which the booking will be cancelled. [2]

In “Parking System Using Android Application” J. Anitha, Y. Thoyajakshi, A. Ramya, V. Sravani, Prashant Kumar has created an android application which mainly comprises of three modules. 1) The user can choose a location nearest to the current location of the user, 2) On booking a slot, the slot would be updated to the status of reserved. 3) The status is updated to empty if the user doesn’t arrive at the parking slot within 20 minutes. [3]

In “AUTOMATED CAR PARKING SYSTEM COMMANDED BY ANDROID APPLICATION” Mrs. D.J. Bonde uses an autonomous car parking system which using android and aims to provide an effective car parking system. This system uses two sub architectures - 1) for the car and 2) for the Parking area. This system communicates with the system in car so as to control the motion of the car in the parking space. [1]

III. METHODOLOGY

The system we have created is divided into two sub architectures 1) at the user end and 2) for the attendant at the parking location. The system at the user end is as follows:

1. The user first checks to see if the slot for parking is available from his/her mobile.
2. If the slot is available then the customer can select the slot and reserve it.
3. On reservation the slots will turn red and the available slots will remain green.
4. Once the slot is booked the user can proceed to payment.
5. Timer will begin on the validation of the user by the attendant when the user enters the parking slot.
6. The timer will stop once the user leaves the parking slot.

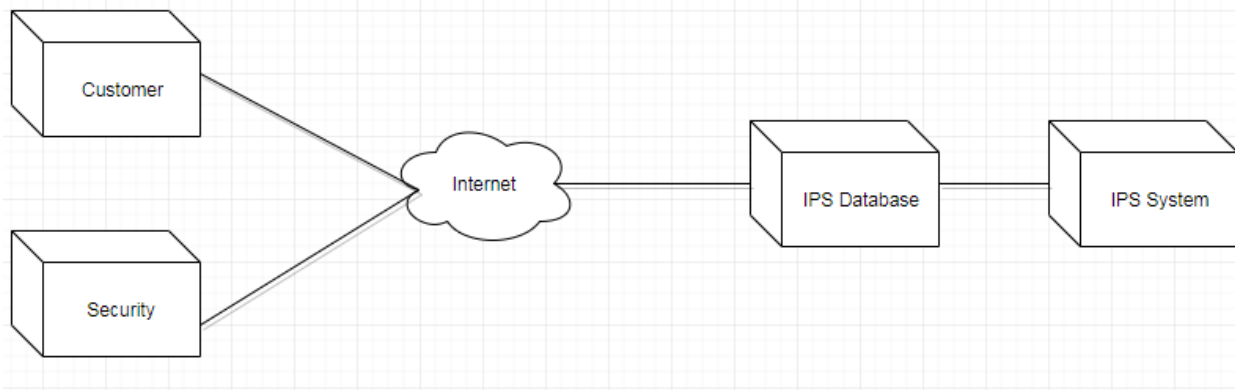
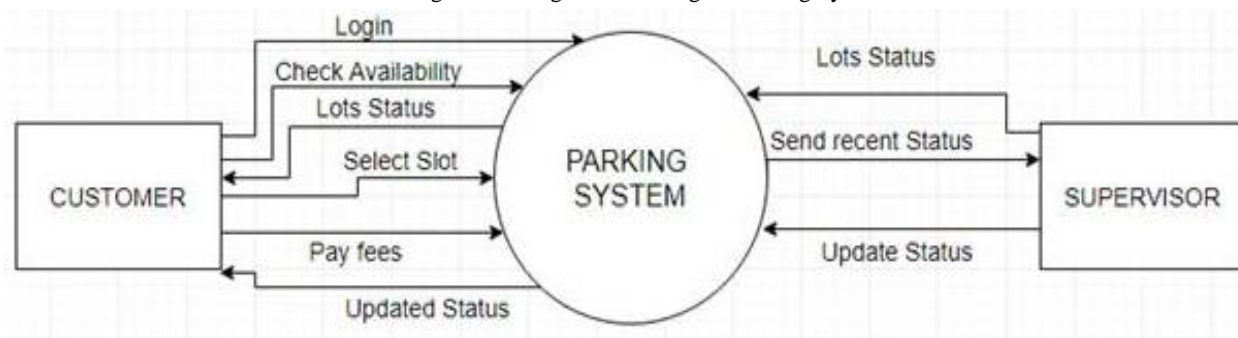


Fig1: Deployment Diagram of Intelligent Parking System

The system at the attendant end is as follows:

1. The attendant can start the timer for the user who enters the parking slot once he matches the car number with system.
2. The attendant can book the slot for on the spot users who have not booked the slot.
3. Here the payment will be done by cash.
4. Once the payment is complete the timer will start and the slot will be updated to booked by the security.
5. Once the user leaves the slot, the timer will stop and the slot will be made available by turning green on the selection page.

Fig2: DFD Diagram of Intelligent Parking System



IV. PREFERRED APPROACH

A. LOGIN PAGE

Any user who wishes to use the application needs to login with an Email Id and a password from login screen which will be authenticated using firebaseAuth and will be given access to the app only if the user is registered.

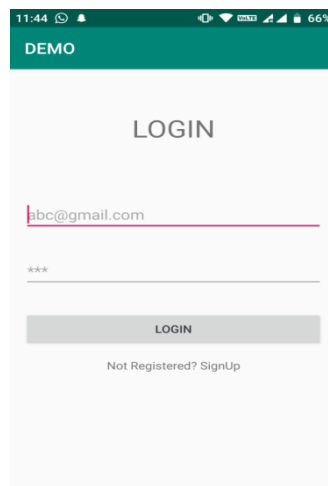


Fig.3:Login

B. REGISTRATION PAGE

User using the application for the first time will have to register through registration page and fill all the necessary information based on the user and his/her vehicle. The registration will be authenticated and processed through firebaseAuth.

C. SELECTION PAGE

This is the main module or main screen where the user will be performing the actual booking. The user will be presented with parking layout with clickable icons that will be updated in real-time according to availability of slot. The user selects the number of hours for parking and proceeds for payment.

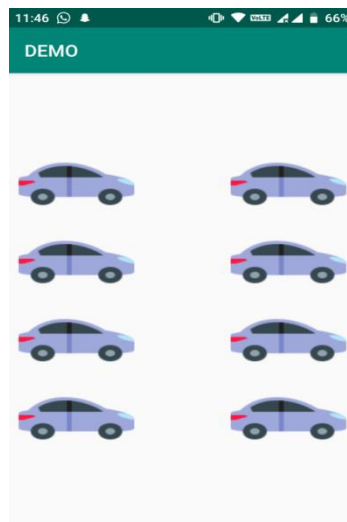


Fig.4:Slot Selection

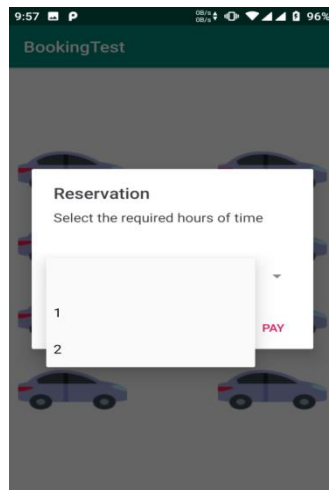


Fig.5:Reservation Time

D. PAYMENT PAGE

The payment gateway vendor will display the user with payment page where the user gets the option to pay through various online payment option. The payment will be processed by the payment gateway and send a payment success confirmation.

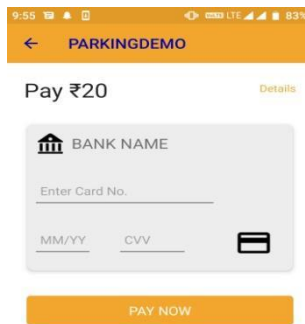


Fig.6:Payment Details

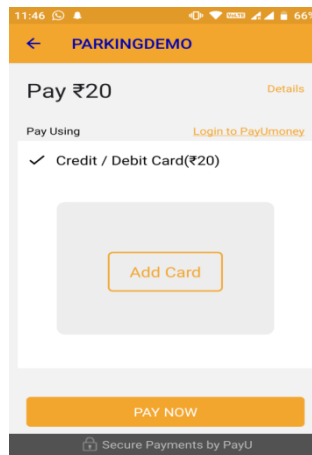


Fig.7:Payment Status

E. CONFIRMATION PAGE

This page will be displayed only if the transaction of payment is successful. This page will display a random uniquely generated code that is unique to the user and the booking of slot that will be updated to the database of the slots. At this module the slot database will be updated with the time and user information.

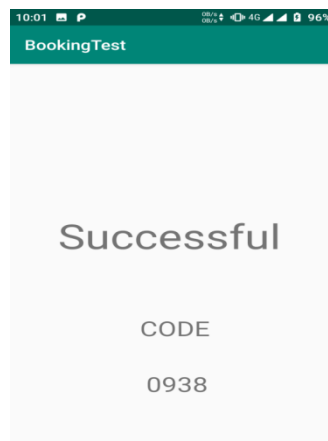


Fig.8:Reservation Status

F. ATTENDANT VERIFICATION PAGE

This module will display the attendant homepage. As the user generates the code, the user's information along with the slot number will be reflected on the attendant's homepage in real-time. The attendant will cross verify the unique code lock the slot to the assigned user. The attendant clears the slot when the user leaves the premises which will delete the slot database for the assigned slot.

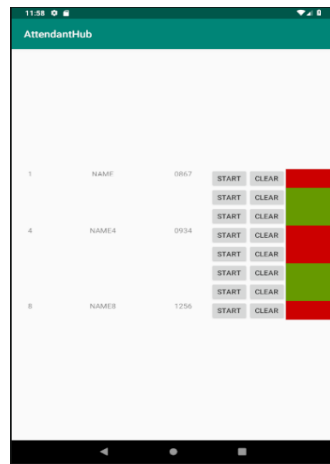


Fig.9:Attendant Verification

V. CONCLUSION AND FUTURE SCOPE

We have studied management of the database using firebase and identified the existing issues in the parking system. In this project we were able to make the car parking system partially software based as the security is required to keep a check on the cars as it is not vandalized or tampered with. The future scope of the project is to have the database hosted and managed on our own servers. to create a cross platform application which will perform on both ios and android .We can also introduce sensors to the system to make the system fully automatic.

REFERENCES

- [1]Mrs. D.J. Bonde, Rohit Sunil Shende, Ketan Suresh Gaikwad, AkshaySambhajiKedari, AmolUdayBhokre” AUTOMATED CAR PARKING SYSTEM COMMANDED BY ANDROID APPLICATION” 2014 International Conference on Computer Communication and Informatics (ICCCI -2014), Jan. 03 – 05, 2014, Coimbatore, INDIA
- [2]1 Hina C. Parmar, 2 Nisha N. Shirvi 1B.E. Scholar, 2Assistant Professor Department of Computer Engineering, “Development of an Android Application for Smart Parking System” © IJEDR 2018 | Volume 6, Issue 2 | ISSN: 2321-9939 Government Engineering College, Gandhinagar, Gujarat, India
- [3]J. Anitha¹, Y. Thoyajakshi², A. Ramya³,V. Sravani⁴, Prashant Kumar⁵”Intelligent Parking System Using Android Application” International Journal of Pure and Applied Mathematics Volume 114 No. 7 2017, 165-174Department of InformationTechnology,Vignan’s Institute of Information and Technology (VIIT).
- [4]Times of India ”From 20.3 lakh to 32 lakh, Mumbai’s vehicle count up 56%“
<https://timesofindia.indiatimes.com/city/mumbai/from-20-3-lakh-to-32-lakh-citys-vehicle-count-up-56-in-just-5-years/articleshow/62501721.cms>