DIGIPARK
A Service Based App

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ABSTRACT

In the current world permeated by the utilization of technology, parking appears to be a problem that has not been given serious consideration. This paper developed and proposed an internet digital parking application, with the assistance of Quick Response (QR) code for the reduction of workforce in parking areas. In Android technology, every compatible device can read QR codes and scan them to produce considerable information. The QR code is scanned by the system for checking the data of the user for authorized entrance. Following such scan, the user is allotted a parking zone on the premise of availability, and upon leaving the allotted space, it'll remain an empty slot to be allotted to the following user. DigiPark, a parking management system, a cloud-based application, that may help users find available parking spaces anywhere and check the provision of parking spaces within the appropriate parking zone. If parking is out there, users can book earlier for the specified number of hours. Users can even compare the hourly cost of the assorted options available and choose the most effective one. When booking a parking zone, the user will have to provide certain information like his vehicle number, entry time, exit time, etc. this could mitigate human effort through the utilization of easy software and hardware, while ensuring authorization and safety to users

Keyword: - *QR code, smart parking, digital payment, android studio, and authentication.*

1. INTRODUCTION

A car parking zone or a parking lot is usually described as a spacious empty area, intended for parking of vehicles and in majority of states, where cars are the first transportation mode, parking lots are important features of cities and suburban regions. In modern parking lots, technologies are adopted to assist motorists and drivers to search out empty spaces through parking guidance and data systems, after which the vehicles are retrieved – such may be a convenient traveling and daily experience. the advantages of recent car parks include adaptive Indoor Positioning System (IPS) and even mobile payment alternatives.

In the same way, car parks in shopping malls are fitted with cameras one each slot to stay track of total occupancy and to see where lost cars are located. In relevance this, there are several online booking technologies that assist drivers look for long-term parking in an automatic way, while facilitating cost-savings for people who book before time. Real time inventory management checking technology is employed to display available parking lots, categorized by price and distance from the target destination. Thus, such modern online booking technology assists guests to see parking spaces conveniently and simply. They facilitate easy parking for the guest instead of having them go around and around searching for an empty parking slot. this might be resolved through the rise of the quantity of parking spaces but such solution needs significant investment and construction, and also extra spaces block traffic and inhabitants of the area. India is getting motorized i.e. the speed of personal vehicles is more as compared to public transports. because the rate of individuals owning their vehicles increases ,the need of parking slots to park vehicles also increases. this situation results in the unnecessary crowding of vehicles on the road and also leads to inconveniency of individuals walking on the road

Thus, this paper proposes an application that gives easier and more convenient solution. The project involves creating a system/application for parking, with the first idea of enabling guests find parking areas expediently without hassle. Guests must make sure that they need the app in their device for logging in, filling up parking details and time periods, after which, a QR code is displayed to their application for confirmation. They'll proceed to scan the QR code upon reaching the parking lot for authentication and entry.

2. RELATED WORKS

The present study examines several smart parking systems that may assist drivers to park their vehicles and provides a discussion of their weaknesses. the main focus is placed on designing and proposing a brand new smart parking system that would resolve the tedious search of drivers for vacant parking spaces in parking lots.

In a related study [1], the aim was to furnish a dynamic solution of the concept of parking system via the web, through the utilization of current techniques. The system improves the parking system existing components in colleges, running on smartphone platform and providing a visible display of vacant lots. the first requirements included GPS, QR code scanner, and mobile web map. The study examined six parking spaces within the College of Engineering and published it on the online map server to be made available for drivers [6].

Moreover, in another study, [2] proposed a model to parking issues, using Geographic information system (GIS), where all the activities are reflected within the database. The system involved the publication of a web Server Application Programming Interface (API) over the web, whereby the vehicle driver can access it through an application.

Moving toward another work done in this field, [3] proposed the ease Parking Application, to be integrated into the system between hardware of parking sensor and software of mobile application. The software had three major functions namely, displaying information on available parking, setting parking ID and parking location, and user information. It also displayed the building map and also the plan for every floor highlighting the parking availability. For parking location, the user needs to set the parking ID through manual keying-in or QR code reader, then the parking location will be accessed from anywhere within the building

Rongxing Lu et al [4] proposed a brand new model Smart PARKing (SPARK) scheme, which follows the Vehicle Ad Hoc Networks (VANET), that provides drivers with accurate and ease parking services in large parking space, including realtime parking navigation, intelligent antitheft protection, and friendly parking information dissemination. In [5], authors introduced a scalable information dissemination algorithm for discovery of free parking spaces via VANET.

3. PROPOSED SYSTEM

The proposed system is used by the user to reserve the parking space. Here the user is able to reserve a parking space. Once in the space the time will start later the user will leave the space he needs to pay for the amount of time his car is placed in the entrance area.

3.1 System Architecture

A system architecture describes the structure, behavior and further view of the system and analysis. The goal of design is to provide the system module used to build the system. So once he has entered the parking lot his parking time will begin, if the person will not go with the car at the appointed time a warning message will arrive. Then in time he leaves the area from time to time will be calculated and the fee will be paid.

As we will see within the block diagram, the end-user can register with all information including address, bank details, contact number, etc. Bank details are going to be taken for verification and digital payments. By tracing parking lot, the user will be directed to the closest available parking lot. The system admin are going to be liable for displaying the vacant and updating the availability of the slots. After the allotted time of the parking complete the system will send an alert message to the user inquiring for exceeding the time otherwise the penalty are going to be charged. This application will have multi-lingual support. All the records of users and payment are going to be maintained by the system admin itself.
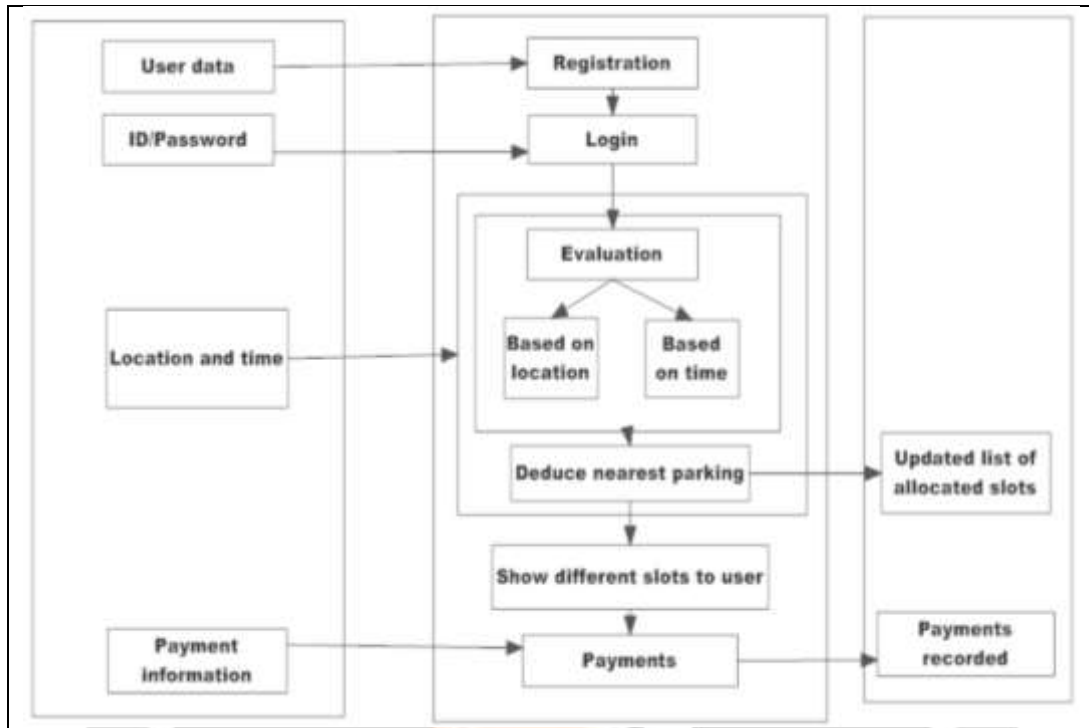
Fig -1: Block diagram

4. IMPLEMENTATION

Smart Parking System are built on Android framework and web interface so as to form it easily accessible. The users are ready to explore for nearest parking lot around them using GPS and Maps API. Also, booking will be done online. Booking options are going to be available even before reaching the parking spot through the application online. The system will have a limit after the booking is finished, if the user doesn't arrive within the deadline then the booking are going to be cancelled. Cancellation charges are going to be applied accordingly.
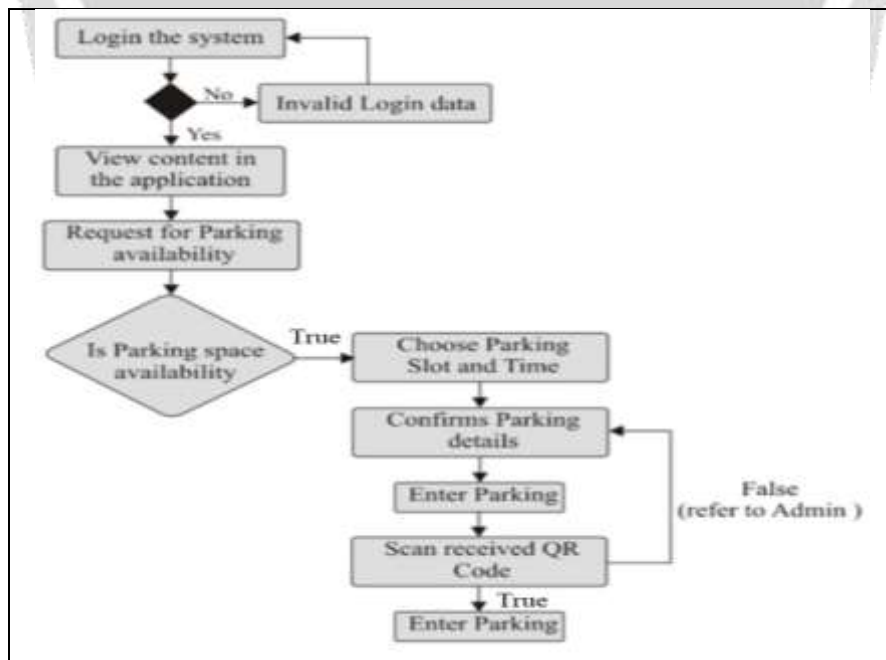
Fig -2: The flow of the system

4.1 System design

In this stage we are going to discuss about the development of parking lot application using Android smartphone. The application is designed in such a way that the guest needs to login through the login screen – with first time users requested to sign up. After completing the signup process, the user can move on to the login screen, and after logging in, a calendar for the selective preferred data for booking of a parking space appears. After the time selection, memos and remarks can be left for the system to take note.

4.1.1 End-user interface

User can create an account on application by registering with their data. User can see there booking detail in the application.
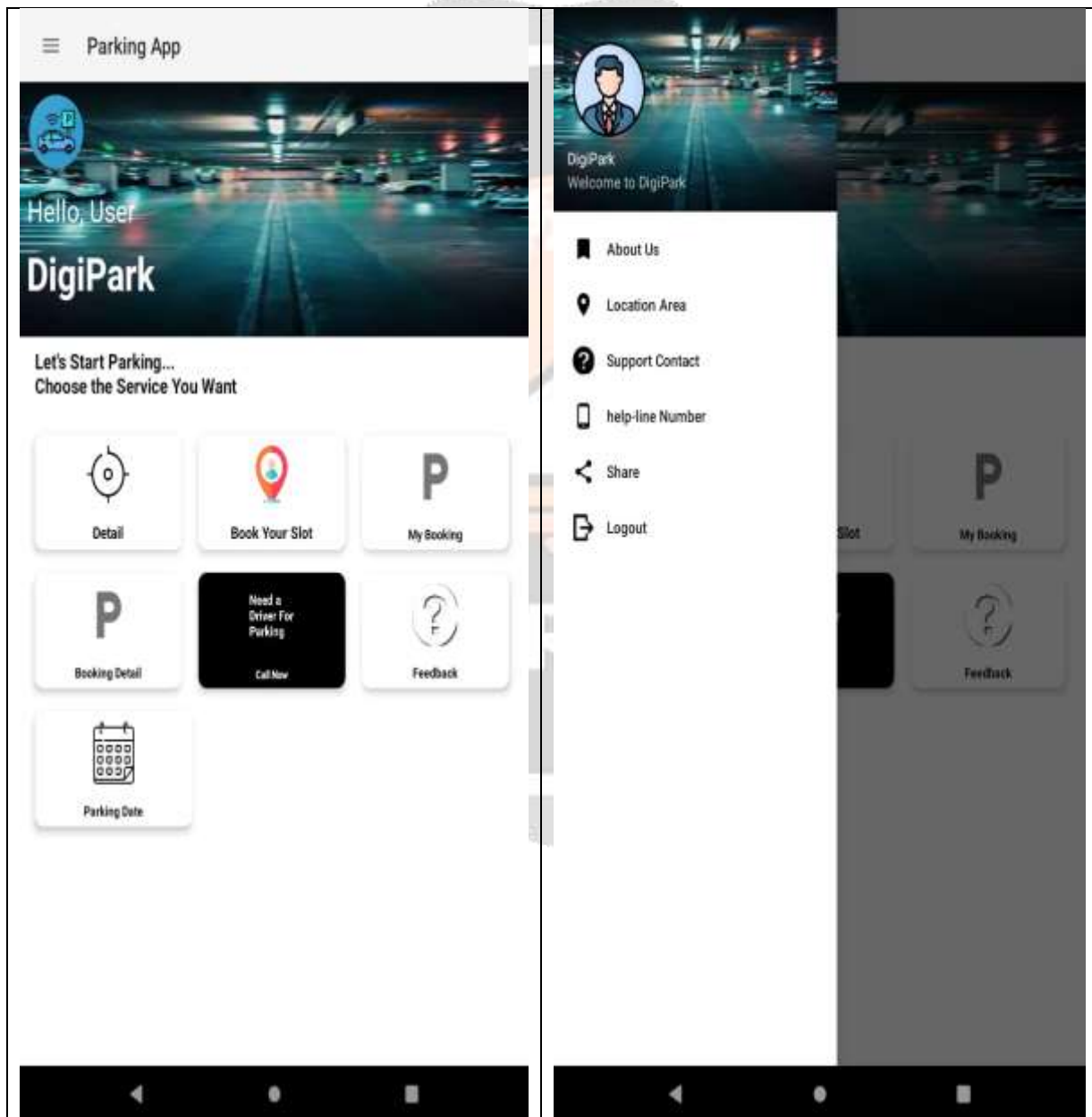

Fig-3: End-user interface view

4.1.2. Registration view

The users can register to the application by giving their data like name, gender, address, DOB, phone, mail ID, and password. Then he will register for the appliance. The admin stores these data. When the user can log in with ID and password. When the user enters a city and he has to park at that place, then he has to enter the area, thereby he gets the closest place at that place with secure slots and do payment. The time for parking is additionally notified to the user. These payments will be transferred to the admin's bank
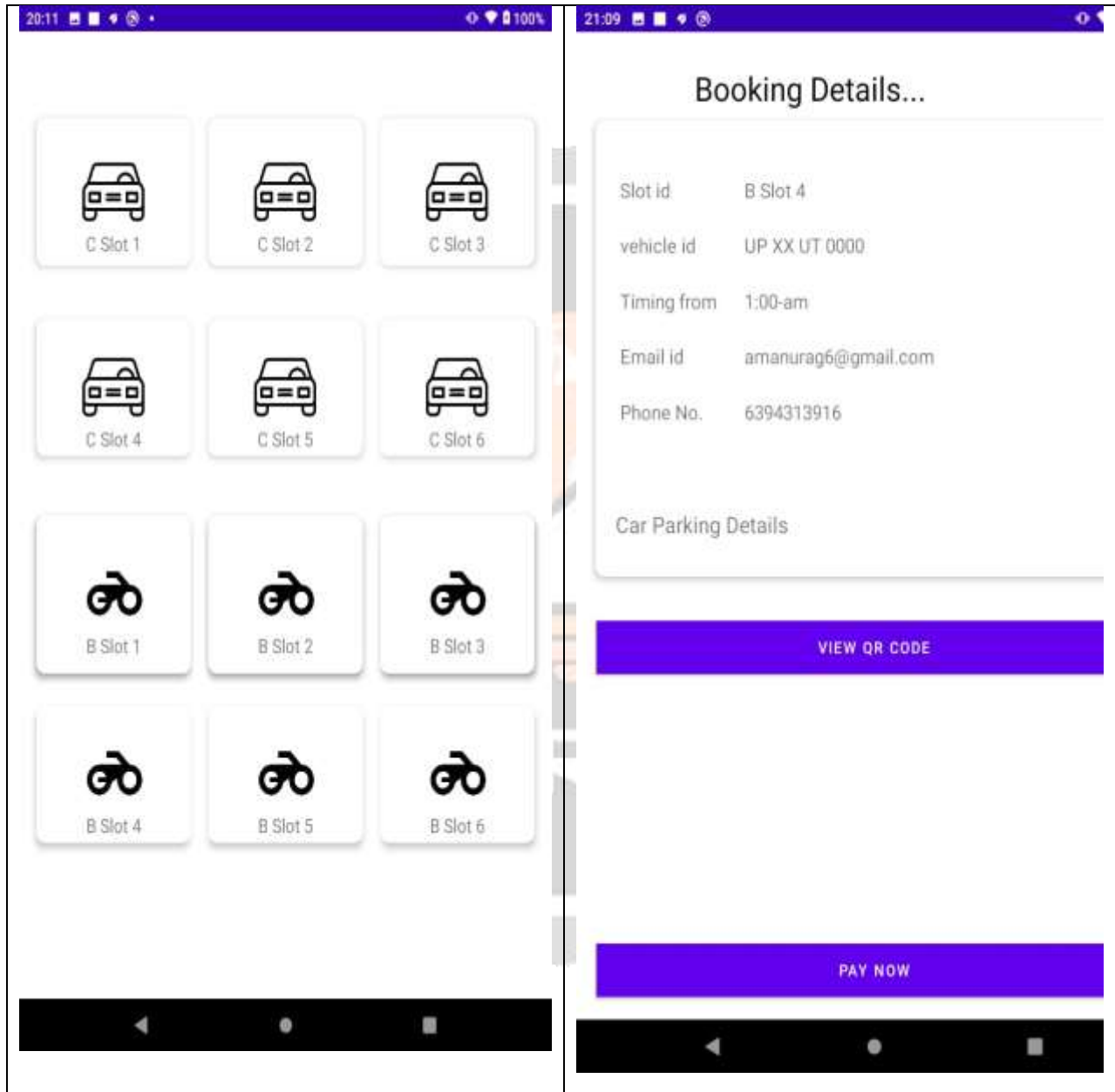

Fig-4: Selecting bike or car & booking detail view

4.1.3. Payment

This module is a very important module in our project. The application illustrates the parking zone on the basis of the designated area, with the corresponding value, category and time. Data is obtained by the user of the parking zone area and therefore the designated period. The unique QR code of the user is produced by the management system, wherein the individual user's details are encoded, to be authenticated by the system. The user selects a location for parking then he has to book that place and make payment for that place. After payment, he can park the vehicle is extremely safe. The payments are transferred to the admin's bank account
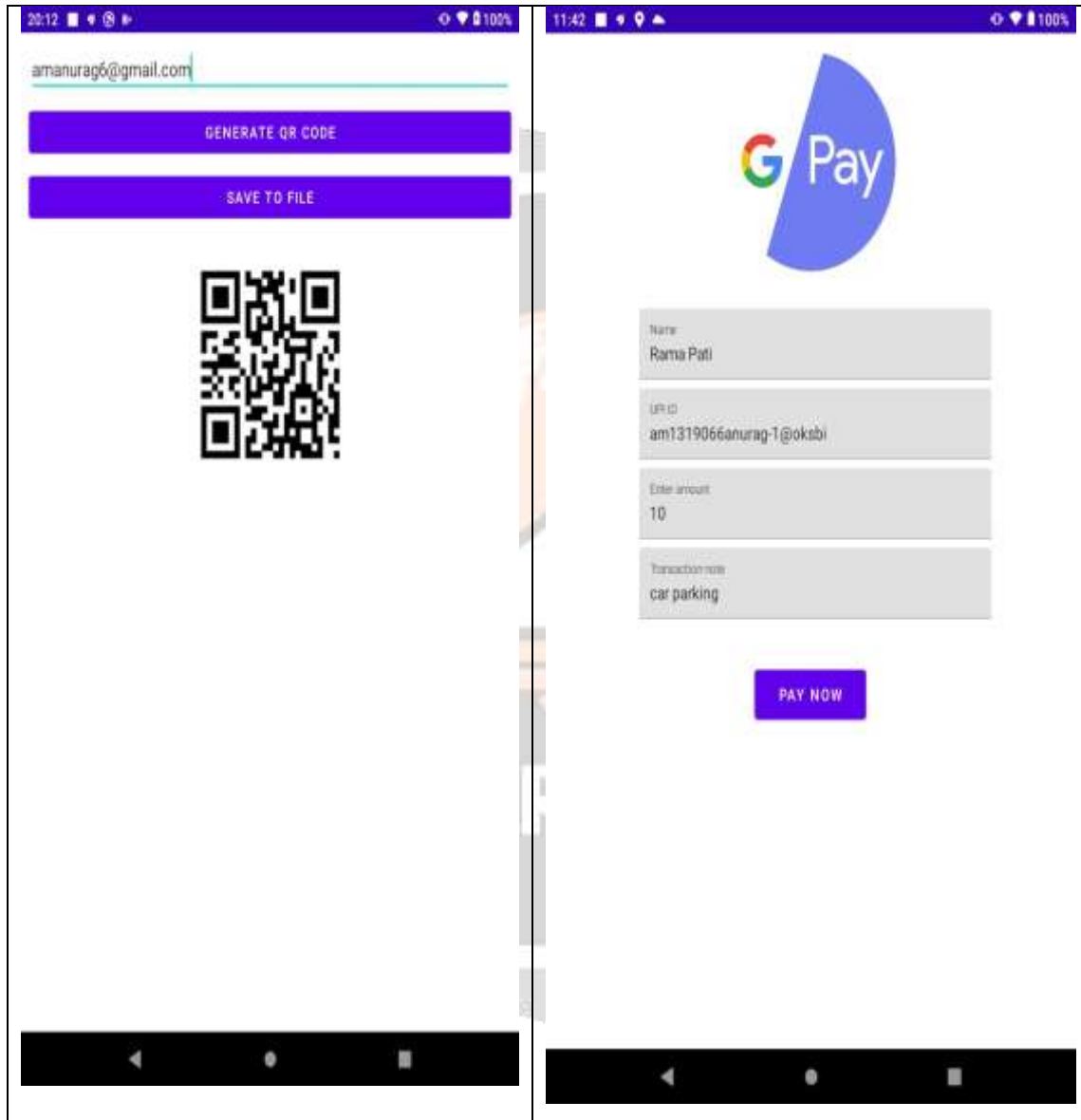

Fig-5: QR code & payment view

4.1.4. Admin view

A system administrator who is complete responsible person for keeping the application secure and always accessible to each user. He can maintain, configure, control and reliable operation of the system. The main roles and responsibility of the admin in this section is to, added car parking areas, booking area database management, car parking, location management, notifications to users, view feedback and respond to that complaint.
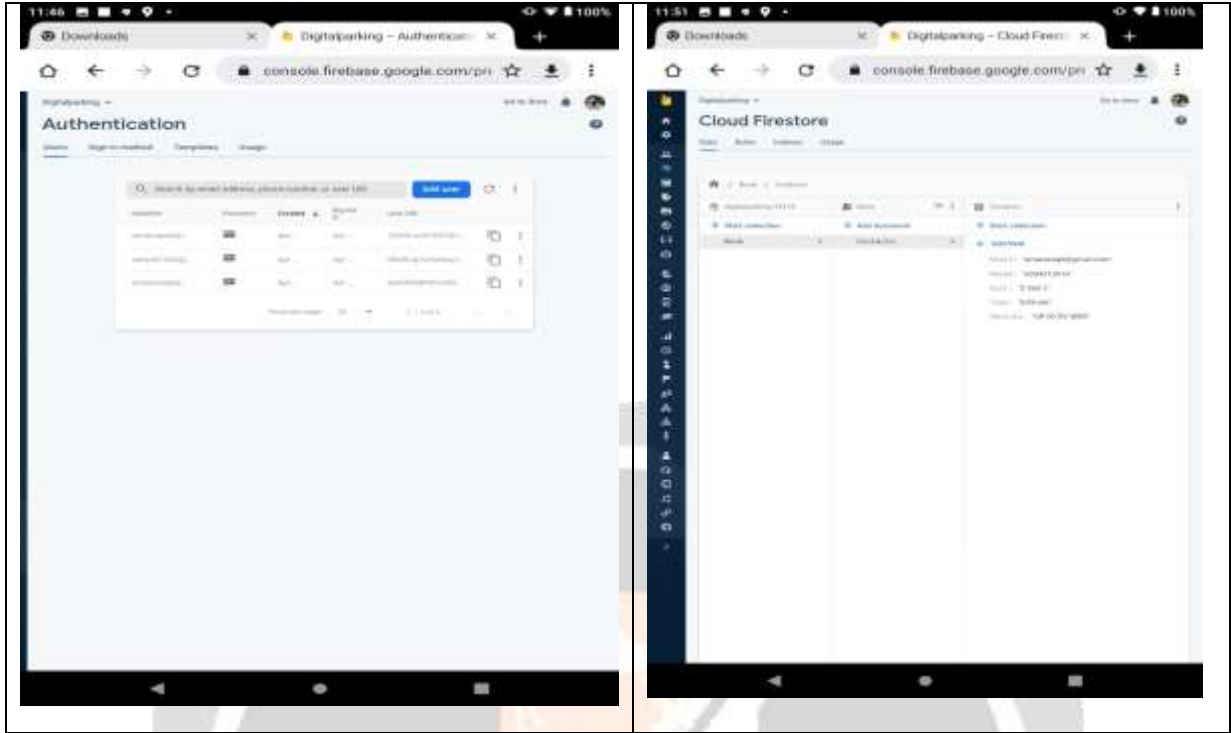
Fig-6: Authentication & user data store (admin)

In figure , Graph report is generated by the analytics of google firebase that shows the daily active users and the retention of the day and also show the read and write activity in the firestore. This report can seen by the system administrator only.
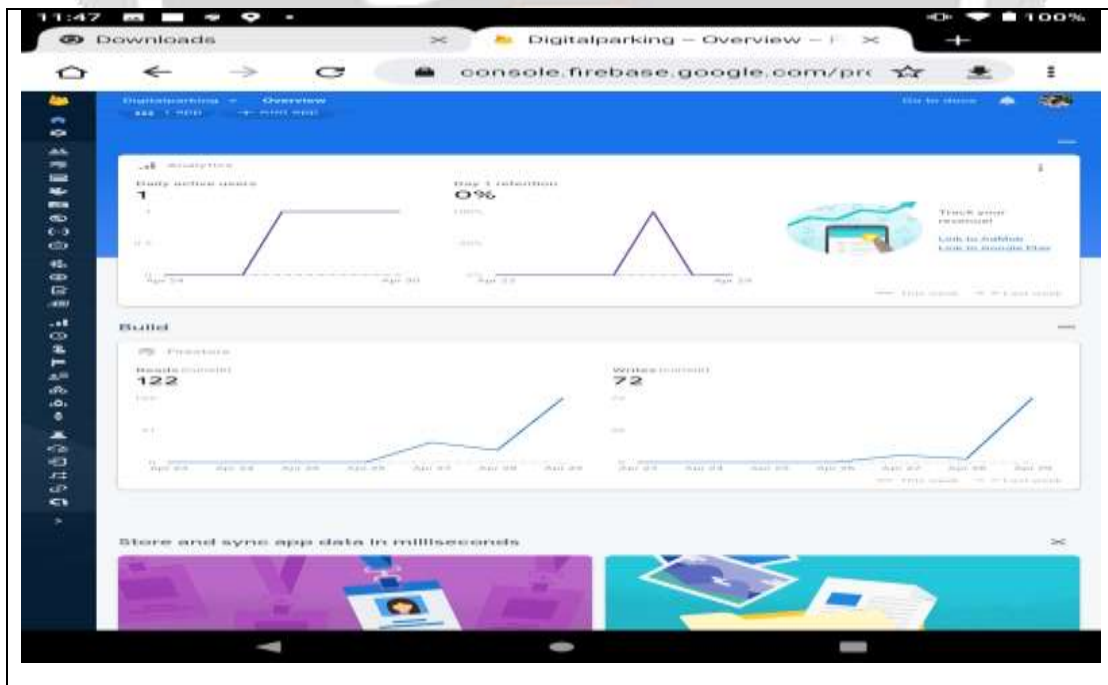

Fig-7: Graph report (admin)

5. EXPERIMENTAL RESULT

We have tested our application system, a user selected and look for park his vehicle within the city. We've got utilized that users who have installed the proposed application on his smartphone and explore for parking.

- He gets the closest place for parking with security
- Time allocation is additionally tested and successfully worked
- The payment module is additionally tested and find full output

6. CONCLUSION

In this paper, we've developed a Android Application for Reservation-based Smart Parking System (RSPS) to optimize parking management. in this system, we introduced parking reservation policy to balance the benefit of service providers and requirements from the users. Moreover, we've presented the detailed design, implementation and evaluation of the prototype. On the basis of the obtained results, we conclude that The system we offer provides real-time information about the supply of parking spaces within the car parking zone. Users can book a parking lot with our mobile app. So users can save their time to find parking spaces.

7. ACKNOWLEDGMENT

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