Automated Car Parking Using QR Code

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Abstract-*Due to the lack of proper parking management system, there has to be a solution which helps getting rid of problems. Although various traditional PGIS (Parking Guidance Information System) exist, they can serve only a few users because it is difficult for such static systems to disseminate information on a wider scale. Thus, the aim of this study is to present a dynamic solution by introducing the concept of parking guidance system over the internet by using one the latest secured technique available today i.e. QR code. The system is designed for parking of vehicles which can be extended further as required. This system enhances the already existing components of parking system available. It runs on a mobile smart phone platform and provides a display of parking lots available to the user so that user can book or reserve a parking space of their choice. At every parking space, the Quick Response QR is affixed. The user is required to scan the QR code which will be generated after booking while parking and un-parking the vehicle. All the booking details will be then reflected in the database. The parking information which was uploaded on the web map server can incur in the android application. This system reduces the fuel consumption, user's frustration as it reduces the time which is involved in searching the parking space. Thus, it reduces vehicle travel time as well as Fuel and parking time and keeps user's vehicle safe.*

Keywords—*Parking, QR code, Android application, Parking lots.*

I. INTRODUCTION

Road traffic creates many problems and one of them is Parking. Parking issues arises due to increase in the use of automobiles, no amount of space is sufficient to accommodate stationary vehicles. The main problem is to manage parking in congested areas. Parking spaces are either insufficient according to the demands or these spaces are poorly allocated. Thus, improving parking system is important.

Due to the lack of a proper parking management system, many parking problems are arising. Although various traditional PGIS (Parking Guidance Information System) exist, they can serve only a few users because it is difficult for such static systems to disseminate information on a wider scale. Thus, aim of this study is to provide a dynamic solution by introducing parking guidance system over the internet and using latest technique available i.e. QR code for user's ease.

This approaches for managing parking in campus/Parking Area is by improving the efficiency of the use of existing parking spaces, by informing user about available parking space and guiding them accordingly.

Android smartphone enables user to virtually carry the internet with him. A. Mobile web Map It is a service application providing maps. By using map user can find spaces on his phone. QR code encodes binary information into a square matrix of black and white pixels. QR code scanner application is able to decode information encrypted in QR code. QR code is used for allocation and de-allocation of space. Hence this system focuses on use of user interface including navigations for enhancing efficiency of parking system. The main goal of this project is to maximize the occupancy of parking lots and develop a user-friendly mechanism that helps user find and reserve available parking in the area, in advance.

II. LITERATURE SURVEY

[1] Now-a-days, there's a Rapid increase in parking management. Manpower is required for each car parking slot to select a parking slot manually and provide route to drive to the slot. So, there is a need to develop an automated parking system with the intention to reduce the guide work as well as it could be useful for parking of vehicles [2]. Parking system automatically revel in parking associated challenges, mainly in the cityand metropolitan regions. While doing a survey we've got locatedthat this automatic vehicle parking gadget has been proposed by means ofvarious researchers the usage of different era. In a few papersome researchers have proposed this gadget the usage of AroundView Monitor (AVM). In their paper they have got discussesfusion of AVM and ultrasonic sensor, used to locate thevacant parking slot within the automated vehicle parking system. TheAVM affords a without a doubt 360 degree scene of the automobile inchook's eye view. The AVM enables the driver to maneuver intoparking spots. Through the fowl's eye view, a driver cantest for

impediment around the automobile. First, the parking slotmarking detected within the AVM photo series. A treestructure-based approach locates the parking slot marking the use ofperson AVM photo sequence and photograph registrationapproach. Second, empty slot isdetected using ultrasonicsensors. The possibility of parking slot occupancy iscalculated using ultrasonic sensor records obtained while thecar is passing by parking slots, and ultimately the chosenempty slot is tracked and the automobile is well parked in decided on parking slots[2]. Some other researchers havespoken this system the usage of any other generation i.e. GSMTechnology. The capability of the era is that consumersends a message to the GSM modem which is located at theparking stop. The GSM modem will ship a conformationmessage to the user whether or not the slot is vacant or not. If it is vacant then the consumer has to message the exact time andperiod, he/she wants to park the vehicle within the parking slot. Then the GSM modem will send a password and the parkinglot number to get right of entry to the reserved automobile parking space. Once theconfirmation message has been ship, the counter for thereservation time will mechanically start for sending message[3] Another paper attempts to talk about this System using FPGA Technology in their paper they've talk how to put in force an automated vehicle parking gadget the use of FPGA technology ,in which the get admission to inside the parking which is made by means of barrier, if there are vacancies with the lifting of the barrier a price ticket is issued with a purchaser code and there starts off evolved a timer for measuring the time left inside the parking. The analog alerts transferred thru a digital analog converter as input indicators within the FPGA.To display with FPGA Xilinx software program is used. [4]. Another paper discusses a machine using some virtual key together with a few robot techniques. Whilst a car enters the entry of the automated car parking gadget, an IR detection subsystem detects the presence. Then the system is promoted to enter a valid key and to pick out the option of both parking or retrieving the auto. Each key's checked for accuracy and assigned a designated parking slot .Uponentering the correct key, vehicle is picked up alongside the pallet from the stack system and placed in the specific spot .When drivers return to choose up the car he enters the valid key for which the device will take a look at in its database and

the automobile is return back to the force manner. The stack device will pull down the pallets to make room for incoming pallet. The device consists of robot elevate with automobiles for selecting the auto and placing it within the designating spots

[5]. QR based Attendance system is the idea of the author the Faculty scan the Qr code of every individual student to verify its status of present or not, Scanning of Qr code is done initially because to identify the proper record of present student in the class so the result is generated after scanning. [6].The QR (Quick Response) code reader can scan QR codes positioned

at bus stops to view envisioned bus arrival instances, buses' modern-day places, and bus routes on a map. Anyone can get admission to those maps and feature the option to join up to receive free alerts approximately predicted bus arrival instances for the involved buses and associated routes through SMS and e-mails. [7]. The paper shows an Android-based machine for identity of items based totally on reading of QR codes. The system is advanced to facilitate identity of numerous objects that exist in already created stock. The designed gadget is composed of a database, Web provider for middleman get entry to the database through Web, and the patron Android utility, that may be run on mobile telephones or tablet computers.

III. PROPOSED SYSTEM

This project Proposed a system that will allows the users to Prebook or reservea parking slot by using an Andriod Appication in their smart phones,and System Admin will add all the parking lots available in the location using web Application The aim of this project is to reduce the time required by the user to Search for an empty available parking slot nearby or in desired location, and to resolve the issue of car parking at mall,college Campus, Restaurants,theatersetc. were finding a parking spot is difficult or avaibility of parking slot is not vacant all the time so it will effectively help the User.
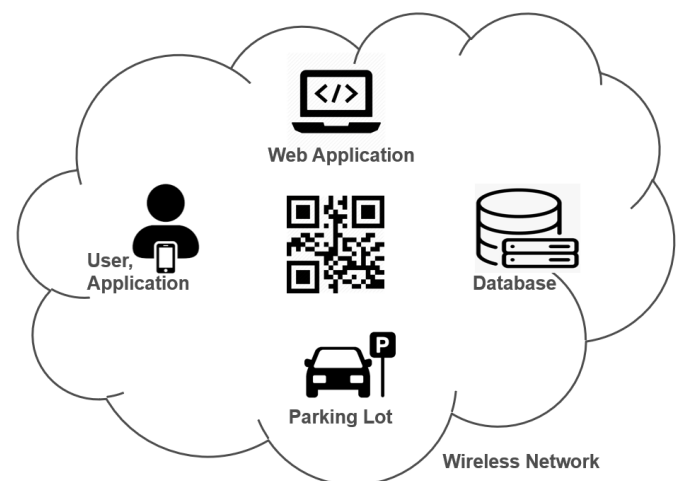

Fig 1-Components of System

A. User Andriod Applicatiom

This Application can help the user to Search for nearby parking lot or slots availability and Book a Parking slot, Display of Qr code and all the responses from the Database's ae visible to user via Application

B. Admin Andriod Application

Admin is the one available at the parking lot, Admin have a Qr code scanner or Mobile with working Camera, Scanning the Qr provided by user,

C. Admin Web Application

This web application helps the admin to alter the user and parking slots, parking slot details are entered using web application which is later displayed on Andriod Application, admin can delete fake user or any illegal user

D. Database

It stores all user Registration details, it stores all the parking lot information and their availability & Qr Generation, Validation
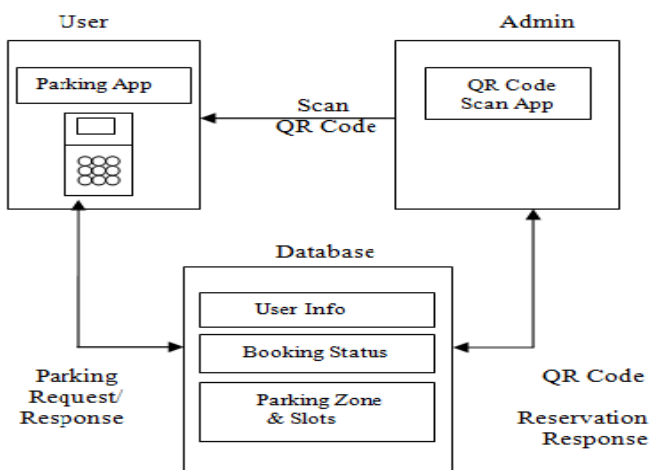It user slot information.

IV. WORKING OF THE SYSTEM

Fig 2-Overview of System

The Main focus of the project is to develop a QR-code based car parking locator system in this admin manages application by web portal using web services over internet. In this Android Application, user all has to do is Register –Login – Book a slot Car parking is allotted with QR Code. Basically, User Register on the Apk (Andriod Application) by providing basic informationsuch as vehicle RC number, person name, phone number, vehicle model, Email ID, Password, Aadhaar card details. Then all these details are stored in the databases After the registration, the User logins and then select appropriate location as per user preferences, the User books a slot for parking on the basis of location and from the available slots ,After Booking all data is stored in the database And then

the slot is booked for the User and a Qr code is generated using xinc Library and provided to user as Authentication proof . The user enters the parking area and shows the QR code to security checker. the security checker verifies the User Qr code and then allows him to park his car according to slot allocated to him.

While Exiting from parking lot User has to Display his QR code which was provided while booking and display it to parking lot security guard checker and then guard scans Qr code After the scanning of Qr code is done the amount to be paid is automatically deducted from user Apk or User Can Pay manually at the parking slot , Qr code is Authentication of Car Owner so after it is shown to the Guard then only user is allowed to leave. Flow of the system, Because using the Qr code it will avoid fake user and theft of car because while registering all vehicle details are required for authentication so this is the safest and efficient way of booking parking slot in advance.

V. EVALUATION AND EXECUTION

Previously user cannot be able to book a parking spot in advance or user have to manually look for available parking spot and to identify whether the parking slots have vacant spaces or not and with the help of android application user can easily identify the available parking space and location as per user preferences and select or book a parking slot in advance so once reaching the destination user don't have to search for vacant parking slots.

VI. CONCLUSION

In this project, we have developed an Automated car parking System using Qr-code to optimize parking management. In this system, we implement parking reservation policy to balance the benefit of service providers and requirements from the users. Moreover, we have presented the detail design and implementation and evaluation of the Car parking system. Based on the obtained results from our study, we conclude that the proposed reservation-based smart parking system can alleviate traffic congestion caused parking searching and reduce the amount of traffic volume searching for parking& Resources used.

VII. FUTURE WORK

    a. Add Upi Payment Option
    b. Use AI or IOT at Parking Lot for Automated scanning of Qr code
    c. Scale the location available for parking slots.

VIII.
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