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SMART PARKING SYSTEM APPLICATION USING QR CODE

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Abstract: Due to the increase in the number of autos on the road, there will undoubtedly be visitor issues. This is due to the fact that current transportation infrastructure and automotive parking facilities are unable to cope with the increased number of vehicles on the road. To relieve the aforementioned issues, the clever parking machine has been evolved. With the implementation of the smart parking machine, patrons can without problems find and relaxed a vacant parking area at any car park deemed handy to them. Vehicle ingress and egress are also made extra handy with the implementation of hassle unfastened price mechanism. Finally, the numerous sensor structures utilized in developing the structures in addition to the current research and industrial system available on the market are tested as car detection performs a vital role in the clever parking system.

Index Terms – SMART PARKING SYSTEM, PARKING SYSTEM, SMART CITY.

I. INTRODUCTION

One of the most important implications of population increase, particularly in metropolitan areas, is the growth of urban tourism. As a result, locating available parking during rush hour is not only time intensive, but it also wastes fuel. Drivers continue to search for the perfect parking spot, causing traffic to increase. Increasing the number of emission cars has a detrimental environmental impact. After then, smart parking reservation has become a must for the day. Visual solutions are an important factor in many issues for the development of today's generation. The number of the latest innovations and new business trends is growing around the world. New business ideas are empowered and great through the gray regions in the regulatory framework. Those games include dealing with small client equity records, grid monitoring and voltage-related limitations as renewable assets are connected to a distribution device, EVs infrastructure, ownership / control meters, flexibility offerings - but they do not hinder affiliate market. . it will be difficult for car users to find a parking space. When drivers try to find a parking space, they can confuse site visitors and increase their carbon footprint. Advances in technology no longer allow humanity on many topics, yet in addition it helps to find parking spaces. The app that we intend to expand explores the parking areas closest to drivers and saves drivers on the complex route they are on.

II. TYPE OF MODULE

2.1 Admin Module

- Admin has to do one time registration in the mobile application. Registration requires the following details
name, mobile number, number plate text. Username and password is also required.

- Add Charges:

On the admin application, charges of parking should be updated for per hour day as well as night.

- View slot:

On selecting parking history, the admin can view the details of that parking area.

- View complaints:

On selecting complain box, the admin can see the complaints of the users.

2.2 User (Patient) Module

STEP 1: In addition, the user must complete a one-time registration in the mobile application. Name, phone number, and number plate text are required for registration. It's also necessary to have a username and password.

STEP 2: The Users can view the parking slot and book the slots for parking.

STEP 3: Users can set the time for the slot while booking.

STEP 4: Until the user parks the vehicle, the slot will be reserved. The park will be marked unoccupied if the user fails to park the car within the given period.

STEP 5: The car timer begins when the user parks, and it ends when he or she exits the spot.

STEP 6: Payment will be based on the parked time.

STEP 7: Payment can be done by Wallet through online transaction.

STEP 8: Complain or feedback can be provided.

III. EXISTING SYSTEM

Parking management companies are aiming to deploy the best and most technologically advanced solutions in order to meet the growing demand for parking spots. Various methods have been used abroad to disseminate information on the availability of parking spaces on various platforms. The smart parking app will allow you to check and book the availability of parking spaces in real time thus providing a seamless parking solution for users. Cloud deployment not only frees controllers from repair tasks but also makes the system more environmentally friendly.

IV. RESEARCH AIMS

- Mainly dealing with searching and location problem.
- User can see the free space.
- Reserve that space.
- Plays a very vital role in managing parking.
- Minimizing the road traffic.

V. PROBLEM STATEMENT

The traditional methods of lighting up parking spaces have gained popular in recent years. Blind search is the most popular strategy that all drivers agree on. In the form of punches and misses, drivers explore parking lots. If the driver finds an empty space, he can continue to park his car in another parking lot. Another technique that drivers have consented to is the sharing of parking information. The current situation of the parking slots is displayed. If a driver gets information on parking near his or her destination, he or she will almost certainly be aware of available parking spaces in the vicinity. As a result, it is the responsibility of drivers to park their vehicles. If there are limited parking places during business hours, the driver will have to work extra hard to find one. The event is called "one place after many cars", which also causes a bad bottle. To minimize the "multi-vehicle" one-slot event ", some designers have developed a solution for using a database that exposes live availability information. The start of the bath is determined. Therefore, the system will show parking spaces as fully loaded if parking spaces are too few at first. But it is difficult to determine the buffer limit. If the database is too small, the "multi-location single-location" problem will not be solved. If it is too much, the use of parking spaces will be minimal.

As a result, to address the drawbacks of the parking methods, we created an Android-based programme. The driver can use this technology to check the availability of parking spaces before entering the parking lot. The app shows the user a screen with available parking places, allowing them to schedule or find a spot whenever they need it. By minimizing the time, it takes for customers to find a parking spot, the system greatly decreases traffic pollution and its effects.

VI. PAPER OBJECTIVES

This project aims to introduce smart parking system which totally differs from the normal parking system. This project is introduced to make parking process efficient. Mainly dealing with searching and location problem, user can see the free space, reserve that spaces, plays a very vital role in managing parking, minimizing the road traffic. It can be widely used in stadium, theatres, multinational companies, and colleges.

VII. BENEFITS

- There's a higher sense of security because customers don't have to walk to and from their own area.
- It's a possible option for extremely small websites that wouldn't be able to accommodate a traditional tiered parking facility.
- There is an abnormally high level of parking performance.
- There may be no need to ride while looking for the location.
- Emissions have been greatly reduced and reduced.

- Customers are greeted in a significantly regulated environment as they wait for their vehicle.
- There is a substantially lower risk of car vandalism.
- If it's miles used by reputable parkers, there's a minimum staffing need.
- It's far viable that the retrieval time is decrease than the combined riding/parking/walking time in conventional ramped parking structures.
- Facade integration is easier because there are no ramping floors or apertures in the exterior walls.

VIII. METHODOLOGY AND EXPERIMENT

8.1 Proposed System

To overcome the disadvantages of previous applications, we tend to suggest AN application for mechanical man users. In our system we tend to be principally managing looking and placement issues that resulted in termination of previous systems. To contend with the parking system, we tend to introduce mobile application which can facilitate individuals to beat from the matter of parking. In map user will see the free area and reserve that individual area. Parking steorage data system plays a really important role in managing parking demand in time and area, upgrading the parking facility utilization, minimizing the road traffic showing from finding out parking, upgrading the potency of the facility, upgrading operation conditions, and incrementing economic vitality of business areas so on.

8.2 Proposed Methodology

To make the system more efficient through the internet, the first parking lots were registered on the web map server with their length and latitude. A QR code is used to identify each parking spot separately. Fields like space id, latitude, and longitude are used to build QR codes. On the parking lots, QR codes were printed and pasted. A website is built that lists all of the allocated parking lots as well as their characteristics. API (Application Programming Interface) is a Web Server Application Programming Interface that has been developed and published online. The API can be installed by the driver through the application. The user must be connected to the internet via his or her smartphone in order to use the app. The user must create an account with the system by giving information such as their name, password, email address, and phone number. The user can then use the app to locate and reserve open parking spaces whenever they need them.

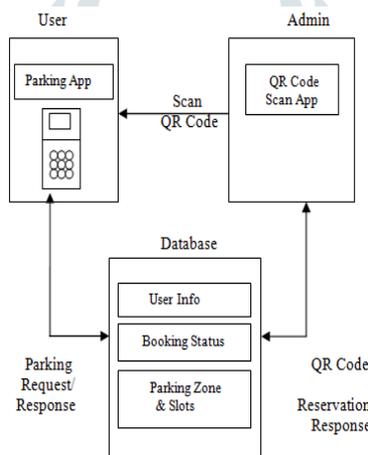


Fig (a) Proposed Methodology

8,3 Design and architecture

- **Hardware:** The system hardware is organized into three main components, a QR code scanner, a central server and a mobile device. The program contains 3 parts of Hardware namely. 2 Android Smart phones and Central Server. One Android Smartphone is for a user who can have a parking app and the other is for a manager in a QR code scanner. Both phones must have an internet connection. The Main Server is connected to both smart phones to perform various SQL functions.
- **Software:** Fig. (a) Shows the user API software architectural design, particularly defining the Android application as the system's core site for user apps, as well as the Host application as the distributed system's point of control and configuration. The following sections go through the most important aspects of software.

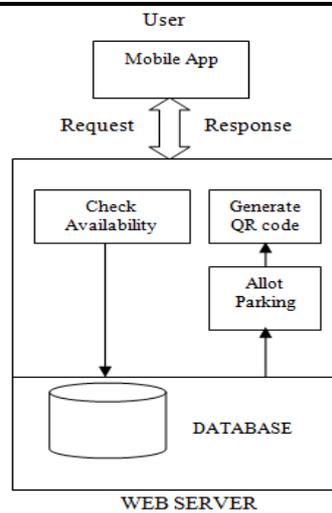


Fig (b) User API

The Smart Parking System's Main System Architecture depicts reservation-based parking. The apps are created on the Android platform. In SPS, two separate apps are used. One is for the user, while the other is for the parking lot administrator. The user's phone's Parking app is used to reserve a parking spot in the selected parking lot. To use the services provided, the user must first register an account. After creating an account, the user can log in using their mobile number as the username and password. After that, the user can choose a suitable parking lot and verify its availability. If there are any available spaces, the user can make a reservation. Only one place can be reserved by a single user. The user must provide the vehicle's identification number, as well as the reservation's start and end times, to make a reservation. After reserving a parking spot, a QR code is created, which is used for admin login. The admin Fig.(b) end of the app is used to scan the QR code created in the users parking app when they reserve a place. This ensures that only users who have made a reservation are permitted to park their vehicles. The database is automatically updated and the corresponding Parking spot status is changed from RESERVED to OCCUPIED once the QR code in the user's phone is scanned and found to be authenticated. All parking slot details are visible to the administrator. Parking spaces would be represented by graphical boxes in green and white. Each color indicates one of the constraints. Green Indicates slot is reserved; White indicates that the slot is free.

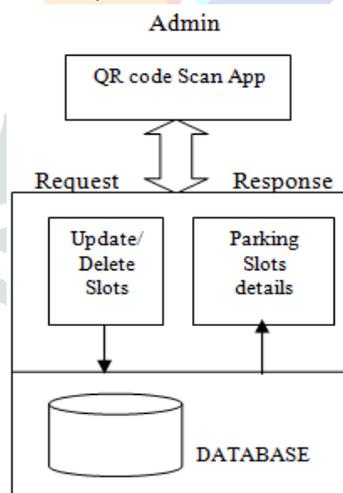


Fig (b). Admin API

IX. ECONOMIC FEASIBILITY ASSESSMENT

The development of this system does not require investing money in it. So, what is available is used. What is available is also used because the system does not intend for commercial are within the present scope form, economic feasibility is not warranted for this system. The Cost of doing a full project is minimum. The estimated price of hardware and software is affordable.

X. IMPLEMENTATION AND RESULTS

We have two android applications User's API and Admin's API where user and admin performs the action of authentication via login into the application which is stored as data in SQL database. User than can reserve the parking space which is handled by admin. We have done the coding part using Android Studio in Java. And the data is stored in the database SQLite. We have examined the application by login to the application as user as well as admin and reserved the parking spaces and various action performed by admin given in detail in further chapters. We have given

our application to different users of our society. Our users really like the application and idea that this helps in relieving the stress and they are free from tension for the parking spaces as they reserved it already.

XI. CONCLUSION AND FUTURE ENHANCEMENT

The application provides the user with a visual representation of the current parking situation. By automating the entire parking procedure, the technology reduces the amount of work required by hand-operated parking. The method makes booking or finding a spot on a smart phone simple for the user. As a result, this application serves as a park space finder. This reduces the amount of time each individual spends looking for a parking spot, which reduces fuel consumption, traffic congestion, and pollution by enhancing transportation efficiency.

As shown in the paper, we may embed Google maps into the user and admin applications so that the user can view the direction using maps to find the suitable parking spot. The GIS (Global Information System) assists the user in locating the parking spot's coordinates and correct path.

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