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A Survey on Smart Parking System Using QR Code

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ABSTRACT: Now a days, parking is really a problem for almost everyone. It is indeed a critical issue. So this paper proposes a solution to handle this issue using GIS (Geographic Information System).

GIS parking system runs on our mobile and provides a visual display of parking slots so that the user can reserve a space in that particular parking area. We are using Quick Response (QR) code scanner for this purpose. The user needs to scan the QR code for parking and leaving. All of the user's activities will be immediately mirrored in the database. This system thus diminishes the time interval involved in searching the parking slot which directly reduces fuel consumption and user's frustration.

KEYWORDS: GIS;API;QR;

I. INTRODUCTION

Use of vehicles has increased enormously in today's world. The vacant parking spaces are not deployed properly. The prime reason for this is the inadequate data the user has regarding available parking spaces. The user generally follow a prediction based approach to find a parking slot and most of the times get disappointed. Many a times he parks in unsought and inconvenient places. The above given approach causes loss of fuel and user's precious time. Incrementing the number of parking spaces is an answer to this problem but it is not an easily workable solution because it requires very large expenditure and is a chronophagous process. Extra parking spaces also affect area traffic and local habitants.

There should be a system which can solve all these dejecting concerns of parking automobiles. Using internet makes the system more pliable as anyone can ingress and use such a system. Technologies like Geographic Information System helps in gathering a lot of information for creating a parking management system. So here we are making an application which helps the user to search the parking space in an efficient manner.This Android application is created that is able to acquire parking information from the map server. The system considerably minimize the fault involved while in search of a parking space thus increasing user's confidence, reducing the search of parking time.

II.EXISTING SYSTEM

Now a day the common parking enlightenment approaches are adopted by people. The most common approach which is ratified by every driver is blind search. Parking spaces are searched by drivers in a hit-and-miss method. If the driver gets the unoccupied space, he parks his automobile else his search for the parking space goes on. Parking details sharing is another way which is ratified by the drivers. It depicts the present state of the parking spaces .If the driver acquires the details regarding the parking lot which is nearby to his destination, then the driver will inevitably know regarding the spaces unoccupied in the lot. So it is in the hands of the drivers to park their vehicle .During the working hours, if the parking spaces are few then the driver has to struggle in search of a parking space. This event is called "multiple-car-followingsingle-space", which further causesterrible bottleneck. To reduce the "multiple-car-following-

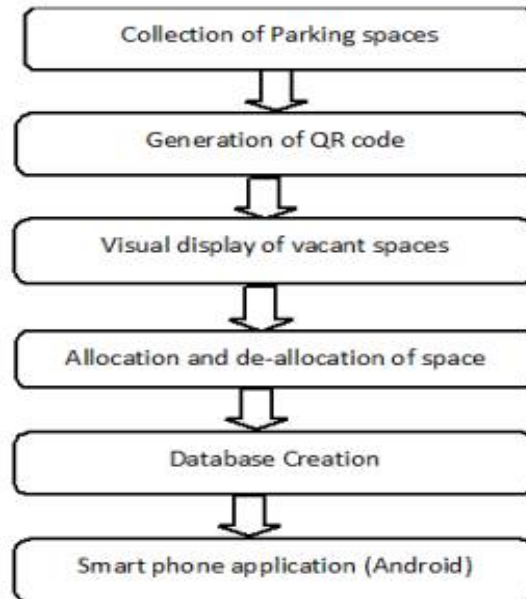


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single-slot”event, some designers have invented a solution to use a buffer that discloses the live availability details. The beginning of the buffer is determined. Therefore, the system will show the parking spaces as fully occupied if the parking spaces are very few then in the beginning. But it is difficult to determine the threshold for the buffer. If the buffer is too little, the problem of “multiple-car-following-single-space” will not be eliminated. If it is inordinate, the usage of parking spaces will be low. Therefore to overcome the drawbacks of the above parking approaches we have designed a system that can be used on Android cellphone. With the help of this system the driver can determine the availability of parking spaces advance to entering the parking lot. The system provides a screen to the user regarding the available parking spaces by which he can book or find a space whenever he needs. The system notably reduces traffic mess and the resulting environmental pollution by decreasing the time required for users to find parking space.

III.PROPOSED SYSTEM

To overcome the disadvantages of previous applications, we put forward an application for android users. In our system we are mainly dealing with searching and location problems which resulted in termination of previous systems. To deal with the parking system we introduce mobile application which will help people to overcome from the problem of parking. In map user can see the free space and reserve that particular space. Parking guidance information system plays a very vital role in managing parking demand in time and space, upgrading the parking facility utilization, minimizing the road traffic appearing from searching for parking, upgrading the efficiency of the transportation system, upgrading operation conditions and incrementing economic vitality of business areas and so on.

IV.DESIGN APPROACH

Figure depicts how the system is assembled. At first parking spaces with their longitude and latitude in the college campus were registered on the web map server to make the system more dynamic by using internet. Each parking space is uniquely recognized by QR Code. The QR code was created using fields like space id, latitude and longitude of the space. The QR Code was printed and stick at that particular parking spaces. A database is created which shows all the delineated parking spaces with their attributes. A web server Application Programming Interface, API (Application Programming Interface) is established and published over the internet. The driver can then ingress the API using the application. The user who wants to use the application must be connected to the internet via his smart phone. The user



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has to download the application and install the application on his phone. He has to register himself to the system by giving details like name, password, email id, phone number. The user can then log in to the application whenever he needs to find or reserve a parking space the available space.

Modules

- **Admin Login:** The system is under supervision of admin who manages the bookings made.
- **User login/registration:** Users have to first register themselves to login into the system.
- **Parking availability check:** User can click on spaces to view the availability. If the space is already booked it will be marked yellow and the available ones will be seen in normal color.
- **Parking booking online for date and time:** Users can book parking space for their required date and time.
- **Automatic cost calculation:** The system calculates the total cost incurred for parking based on the time that user has asked for booking.
- **Parking cancellation:** User may even cancel their bookings by login into the system anytime.
- **Email on successful parking booking:** When user is successful in parking the space, system sends a confirmation and 'thank you' email regarding the space booked.

V.SYSTEM ARCHITECTURE

There are three components in the smart parking model, comprises parking lots, users and the management system. The parking prices, and broadcast live parking availability information to users (also drivers) is determined by the management system. With knowing about parking information, the user chooses a desired parking lot and reserves a space for parking in the parking lot. The state of parking resource is changed by users' decisions taking for parking. The parking lot consists of a group of parking spaces for parking. The on-street parking can also be considered as a virtual parking lot. The number of occupied spaces versus total spaces is the current state of parking lot. To communicate with the management system and users, and share parking information with other parking lots, every parking lot has access to the Internet. In each parking lot, the reservation authority is positioned for verifying the individual user's identity and reservation request. In this case, the reservation authority in the parking lot communicates with the specific user individually. Once the reservation order is confirmed, to hold the related space for the user the reservation authority updates reservation information. For monitoring the real-time condition of parking lots there is sensor system which is deployed in parking lot and it delivers the live aggregated sensing information (the number of available spaces) to the smart parking system. On demand the sensing information is updated. Simultaneously retrieving the parking information, the system updates the state of the parking lot. Based on the state of parking lots, determines the parking prices according to their pricing scheme, the system analysis their occupancy status and congestion level, broadcasts the prices to all users periodically, and stores the parking information and prices for further analysis. In a planned economy the system serves as the centralized decision-making body. It makes all pricing decisions regarding user demands and the state of parking lots. This system is a closed-loop system to actively balance the benefits between users, and service providers, adjust parking price, and reduce traffic searching for parking. We clarify a lot of issues related to the implementation, synchronization, load balancing, including communication overhead and reservation by placing the reservation authority in individual parking lots. Since each user has authority to only communicate with his desired parking lot to make his reservation, rather than the centralized system, the communication overhead of reservation is highly reduced.

VI.CONCLUSION

The application gives a visual display to the user concerning the current parking scenario. The system minimizes work of hand-operated parking process by converting the entire parking process to automation. The system makes it uncomplicated for the user to book or find a space on the smartphone. Thus this application acts as a park space



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seeker. This eventually decreases the time that every person spends for seeking a parking space which then ultimately reduces the fuel consumption, traffic volume and environmental pollution by increasing the efficiency of transportation.

VII. APPLICATIONS

- The proposed project can also be implemented in commercial area for employee parking.
- For public places this system is useful, like parking in malls, stations.
- It can be utilized by companies and organizations (hospitals, colleges) to automate their parking system.

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