PARKING SYSTEM USING ANDROID BASED APPLICATION

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ABSTRACT: With a increasing population, the amount of vehicles is increasing considerably in metropolitan areas. Wireless sensor network consist of many sensor designed to provide information flow from a specific environment. Sensors communicate with each other and receive information from the surroundings. The parking system using android application provides user and easy way of checking availability of the parking slots through an android application. The information obtained from the physical environment is carried into the network environment. The user will only need to download this application and click button to find nearest location for parking. This application reduces the user's effort and time of searching the parking slot and also avoid conjection of traffics. With smart city parking system, it is possible to find suitable parking place, to prevent loss of customers time and to reduce costs.

KEY WORDS: Wireless sensor network, smart parking system, android based application, android.

A. INTRODUCTION:

The number of personal vehicles usage is increasing day by day. Finding a parking space in most metropolitan areas, especially during the rush hours, is difficult for drivers. The user requests the Parking Control Unit to check the status of available parking slot. It provide a vision where things becomes smarts and behaves like alive through sensing computing and communication by embedding small devices which has an interaction with the remote objects and persons through connectivity. In big cities chasing for an available parking slot is always is not easy for drivers and it tends to become difficult with increasing number of user having their own cars. This situation could be taken as an opportunity in order to make advancement in the efficiency of parking resources which will reduce the searching time, traffic congestion and road accidents. The user interface will be easy to use and allow the user to go in-between other apps with ease. For demonstrating the proposed solution, an android based application was developed to provide parking availability information to users. It will use the cell phones operating system Android, which is on a lot of cell phones today.

In earlier days, different models like CLAMP, PARKISM, PARAGENT, MULTILAYERS were used for parking. Before to this traffic authorities in many cities have developed a model called Parking Guidance and Information. This system tells about the dynamic information of parking in the controlled area and guidance the user to the vacant parking slots.

Having a system in place which can automatically keeps tabs on availability of parking spaces and keep the visitors inform so that they can be redirected to other parking slots, would help a great deal in reducing the load on parking authorities on these occasions.

Designing, developing and producing of leading-edge parking technology is called as Smart Parking system. Here we are going to see how to reduce the parking problem and to do secured parking using the smart parking slot allocation method with the help of android application.

B. SYSTEM ARCHITECTURE:

The Smart Parking System is a concept to combine real time reservation with share time reservation, in which a driver can book a slot few minutes ago or any time before arrival at the destination. The system consist of Wi-Fi technology and the IR sensors to monitor the empty space for parking. In this system, the user will look on android application installed in his mobile for the convenient space accordingly. After logging into the

system, the user will choose the space book the slot which will be suitable for him. Information regarding parking location will be given to the user via notification. After that the system updates the status of parking slots and the slot will be booked for the time being.

Detect occupancy status of each individual space in a multilevel parking lot.This means that there will be continuous monitoring of the parking through a hardware device and the status will be automatically updated to the vendor as well as the user. Parking monitoring and management software to coordinate and operate the various features.This will help in providing the accurate available slots for online users and also useful for vendor for calculating the total time taken by the user for parking his vehicle and display the amount to be paid. The mobile user should be able to access parking information for any location. This information is provided in form of maps showing colored streets. The mobile user should be able to choose between three views namely area view, block view and street view. The mobile user will also be able to select one particular parking space and obtain the routing information for that selection. The offline facility is also provided for the user in case if android phone or internet is not available at that moment. In this the user can only view the list of the available parking slots. [1] discussed about a method, Wireless sensor networks utilize large numbers of wireless sensor nodes to collect information from their sensing terrain. Wireless sensor nodes are battery-powered devices. Energy saving is always crucial to the lifetime of a wireless sensor network. Recently, many algorithms are proposed to tackle the energy saving problem in wireless sensor networks. There are strong needs to develop wireless sensor networks algorithms with optimization priorities biased to aspects besides energy saving. In this project, a delay-aware data collection network structure for wireless sensor networks is proposed based on Multi hop Cluster Network. The objective of the proposed network structure is to determine delays in the data collection processes. The path with minimized delay through which the data can be transmitted from source to destination is also determined. AODV protocol is used to route the data packets from the source to destination.

C. IMPLEMENTATION PLAN

1. Start the application:

The user needs to install the application on his Android based device. After installation, the icon of the app will feature on the Home Screen of the user's device. App welcome screen will be flashed to the user on opening the application.

2. Registration:

Initially, the user has to register his details with the application for the first time. This is a one-time registration. The user has to enter details like user name, gender, phone number and email- id. All this data will be stored on server. Booking for slots mandatory has to be done four hours prior to arrival. On server side the parking owner also needs to register the number of parking slots available and for what type of vehicles and the amount that needs to be paid.

3. Login:

Once the user registers, he can use his email id and phone number to login in future. This authenticates the user.

4. Selection of location for parking:

The user is provided with multiple parking locations. User has to select one of the locations provided where he desires to park the vehicle. That will be shown in detail the figure which is below.

Fig 1:location selection

5. Availability:

Status of the slots based on the type of vehicle selected availability of the empty slots will be displayed along with the total slots reserved for that vehicle type. Color coding is used to indicate empty v/s reserved slots. Grey indicates empty slots and Red indicates that currently there are no empty slots for reservation.

6. Enter user's details for slot reservation and Money Wallet:

In case the slot is available, the client can proceed further with the reservation process or else he can go back to change the location/vehicle type or else can terminate the

entire process. Money wallet is a simple, useful and intuitive personal finance assistant with online synchronization, through this a user will pay for his reserve parking slot and the parking owner will receive his appropriate amount.
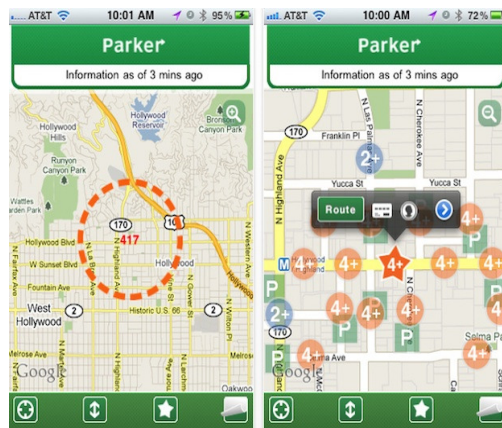

Fig 2: slot reservation

7. Confirmation to user:

On successful reservation, a confirmation page with user details is shown which is editable and Green is indicated to show user's reserved parking slot.

8. Parking Dashboard:

Parking dashboard provides more efficient distribution of parking slots and by using this dashboard the parking owner can manage their parking slots. The parking owner can allocate or de-allocate a parking slot. The dashboard also shows reserved slots which can be allocated when the corresponding user verifies his details and confirms the selected slot

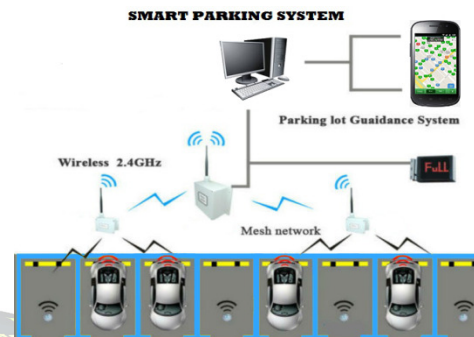**D. DIAGRAMATIC REPRESENTATION**

Fig 3: simple representation

The above diagram represents in simple way of the smart parking systems. It describes that at first the user needs to download that app from the play store that contains all the parking lot guidance that is in which way the user needs to use that app. And it also contains the diagrammatic representations that is it will show the available parking slots which is convient to the user. The full system is working in networks only that is also working in a wireless network.
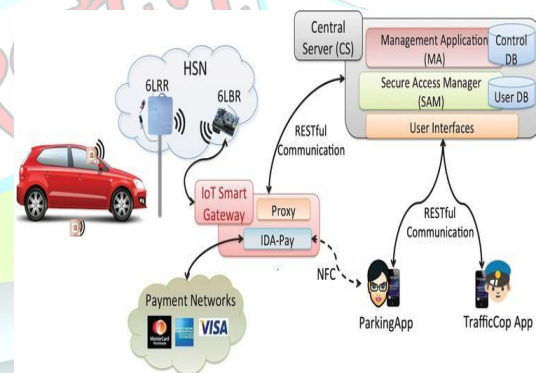

Fig 4: Diagrammatic representation

This is more detailed diagrammatic representation that it will shows the internal working process of the smart car parking system process. That is the parking amount can be paid through the online and what types of cards and mode of payment is also mentioned in that app itself. It contains two types of databases that is management database and the another kind would be the user databases. All the details would be stored in that database of the future use.

E. ADVANTAGES

A parking solution can greatly benefit both the user and the lot owner. Here are some of the top benefits:

1. Reduced traffic – Traffic flow increases as fewer cars are required to drive around in search of an open parking space.
2. Reduced pollution – Searching for parking burns around one million barrels of oil a day. An optimal parking solution will significantly decrease driving time, thus lowering the amount of daily vehicle emissions and ultimately reducing the global environmental footprint.
3. Enhanced User Experience – A smart parking solution will integrate the entire user experience into a unified action. Driver's payment, spot identification, location search and time notifications all seamlessly become part of the destination arrival process.
4. New Revenue Streams – Many new revenue streams are possible with smart parking technology. For example, lot owners can enable tiered payment options dependent on parking space location. Also, reward programs can be integrated into existing models to encourage repeat users.
5. Integrated Payments and POS – Returning users can replace daily, manual cash payments with account invoicing and application payments from their phone. This could also enable customer loyalty programs and valuable user feedback.
6. Increased Safety – Parking lot employees and security guards contain real-time lot data that can help prevent parking violations and suspicious activity. License plate recognition cameras can gather pertinent footage. Also, decreased spot-searching traffic on the streets can reduce accidents caused by the distraction of searching for parking.
7. Real-Time Data and Trend Insight – Over time, a smart parking solution can produce data that uncovers correlations and trends of users and lots. These trends can prove to be invaluable to lot owners as to how to make adjustments and improvements to drivers.
8. Decreased Management Costs – More automation and less manual activity saves on labor cost and resource exhaustion.
9. Increased Service and Brand Image – A seamless experience can really skyrocket a corporate or commercial entities brand image to the user. Whether the destination is a retail store, an airport or a corporate business office, visitors will surely be impressed with the cutting edge technology and convenience factors.

F. DISADVANTAGES

Though there are advantages of Smart City but there are disadvantages to like the disadvantages of smart city is because of smart city there is lot of pollution and it has many industries which can harm the water or our surroundings because of many people's that is air pollution and noise pollution to and most of the people because of the Smart City come and settled in the city so that they get everything which they need so because of this that is overpopulation in a particular City.

- The android mobile user will not be able to insert or view details if the server goes down. Thus there is disadvantage of single point failure.
- Requires an active internet connection.

G. FUTURE SCOPE

This app is a small step to make city a 'smart-city'. This can be developed in future for a wide area like a state or a country so that it can help people on large scale. This app can be sold to the government so that the database for number of parking owners and the server capacity can be utilized. This app server data can be used by government for certain crime investigation details. Currently the app is being developed for Android platform which can be then made available for Blackberry, iOS and Windows phone.

H. CONCLUSION

This paper summarizes an efficient way to park a vehicle using recent technology. This app allows the user to take control of the parking decision unlike traditional method of trying several parking spaces physically. Usage of this app at large scale would benefit user even if a user is in new place. The app is user friendly and handy so people of all age groups can use it easily. The user can check the status of parking area and book the parking slot in advance. This will result in overcoming many problems which are being created due to the bad management of the traffic. Mobile computing has proven as the best area of work for researchers in the areas of database and data management so this application is applied in Android Mobile OS. This application is utilized by can be applied nook and corner due to its easy usage and effectiveness.

I. REFERENCES

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