Multistoring Car Parking System

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Abstract: A recent survey shows that in this fast-growing economy in most parking systems ,the number of vehicles are always more than the number of available parking slots, thus to fix this problem we propose a " Multilevel" parking system which reserves a space for parking the vehicles. It provides a comprehensive parking solution both for the user and owner of the parking space. Features are provided for reserving a parking space, authenticating a reserved user, identifying nearest free space. IR sensors are used to identify if a parking is free. RFID tag attached to a vehicle is used to authenticate a user who reserves the parking slot. Using this system user can easily find out the nearest free available parking area . Availability of a free slot with its location information is transmitted using WIFI module technology, microcontroller and wireless communication technology to the server and is retrieved though a mobile application.

Keywords: RFID Tag, Wi-Fi Module, Ultrasonic Sensor, Arduino, Servo Motor, Node MCU,RJ45 Cable.

I. INTRODUCTION

As the population increased in the metropolitan cities, the usage of vehicles got increased. It causes problem for parking which leads to traffic congestion, driver frustration, and air pollution. Driver don't know where the exact place for parking, it not only takes time but can also fails to find free parking space. This project can minimize wasted time in looking for a parking space and can reduce cost and fuel also. In this project we provided the Payment using RFID technology. Problems concentrated: Traffic congestion, Car cruising for parking created the equivalent of 38 times trips around the world, burning 177914.8 litres of fuel and producing 730 tons of CO2, Air pollution due to traffic congestion. In order to face as smarter, the cities use technologies to enhance their daily routine to develop the standard of life. With a larger number of families exceeding the whole number of vehicles, the parking scenario is falling in need of this requirement within the country. According to a recent survey there will exist a rapid increase in the vehicle population over 1.6million around 2035. Around a million barrels of the world's oil is being burnt daily. In present-day cities finding an available parking spot is often difficult for drivers, and it tends to become harder with an ever-increasing number of personal car users. This case is often seen as a chance for smart cities to undertake actions so as to enhance the efficiency of their parking resources thus resulting in a reduction in searching times. Problems per parking and tie up are often solved if the drivers are often informed prior to about the supply of parking spaces at and around their intended destination. Recent advances in creating low-cost, low-power embedded systems are helping developers to make new applications for the Internet of Things. Thus, a smart parking system is the key solution to scale back the waste stage of the fuel, the answer to the issues that are being raised. The smart parking is often an answer to reduce user's time and efficiency also because the

overall cost of the fuel burnt in search of the parking zone. Creating an efficient and proficient parking system in real-time remains an enormous challenge for any multi-level pubic parking facilities. When the user enters within the car park, the RFID card allotted to the registered user is scanned. This allows the user to urge the knowledge of the parking zone also as SMS notification to the user's mobile number. The scalable and robust nature of Cloud computing is allowing developers to make and host their applications.

II. PROBLEM STATEMENT

The objective of the project is to allow users to reduce the pressure on existing parking spaces in urban areas. An efficient parking system it allows for multiple parking slot on different floor , thus accommodating more vehicles on the same piece of real estate.

III. PROPOSED WORKING

In metropolitan areas, people prefers cab or car as convenient to go to shopping centers, theaters or hotels. Finding place to park vehicles in densely populated area would waste time and consumes fuel during searching for parking space. Hence there is a need for assistive technology, which would communicate the availability of parking slots to the registered users. Mobile app would allow the users to register for the service and if the destination and estimated arrival time is specified, app need to find the free parking space and send the location to the user. User makes the online payment to book the parking slot.
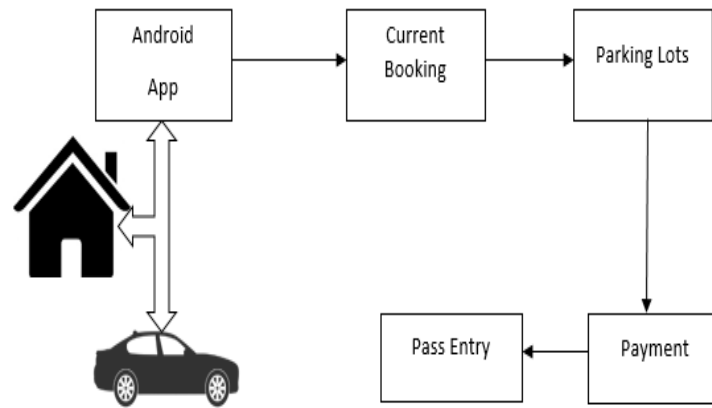
Advance booking

For each parking region, Infra-Red (IR) sensors are deployed and IR sensors would detect the number of parking slots, Number of free and booked slots are graphically displayed in Mobile application and LCD display board, WIFI module is used for communication between mobile app and sensors. Figure 3 shows a detecting of empty parking slot and communicating used Wi-Fi to Arduino.
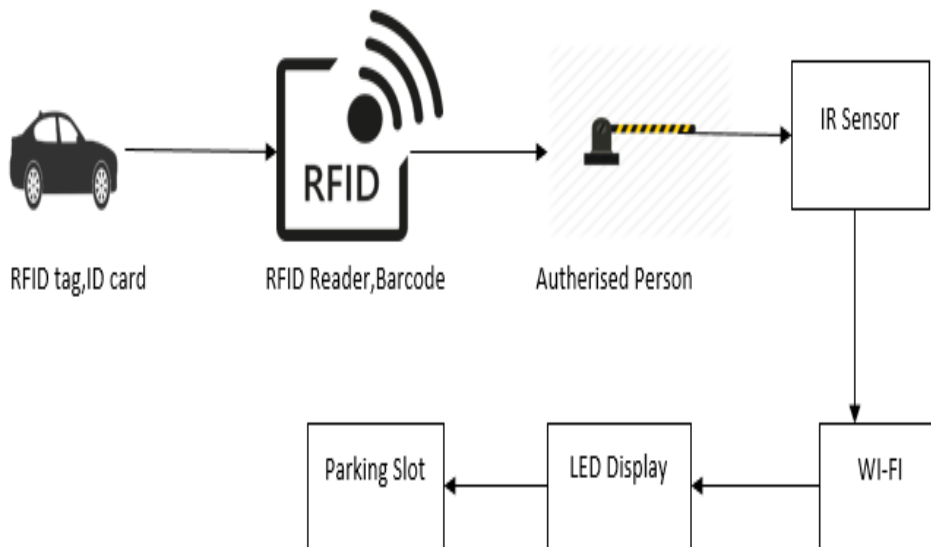
IV. RESULT AND DISCUSSION

- **Identifying Free Parking Slot :**

Free slot identification is verified using Infra-Red (IR) sensors. The IR sensor used for each parking slot. The infra-red sensor detect the vehicle in infra-red waves reflected and covers short distance. A pulse of IR light is generated by the IR sensor and emitted by emitter. Detected the information will be send via WI-FI module to transfer the information to Arduino board and results are displaying LED screen.

- **Authenticating User Vehicle :**

It is assumed that each vehicle has built in RFID tag and vehicle is authenticated by RFID reader. First time users need to register to avail the facility. Authenticated vehicle would get a pass for entry and slot number would be allocated.

- **Mobile App : Parking App :**

The mobile app is developed using Android bundle and Android Studio application platform is used. Application Modules are Registration, Login, selecting date and timing or how many days, Parking slot selection, Price calculation and payment. App also supports current booking and advance booking option. If the booked vehicle doesn't enter parking slot within fifteen minutes of threshold booking is automatically cancelled. shows on the android mobile application starting page user login and registration option.

- **Arduino :**

It is Arduino device which is considered as fundamental part of the system. It is functional for collecting sensors data using wireless communication and it does filtering on the collected data from the sensors and processes the data locally. This step is important to minimize transmitted data over the network and to save the energy. Furthermore, it sends the processed data which contains the number of free car parking spaces to the cloud using web processing the data.

V.CONCLUSION

The multistoring car parking system had successfully designed and developed. The multistoring car parking system can reduce the traffic problems. By using this system park multiple number of cars in small area. The number of
 entering and existing car from all the floors was controlled as per the signals from the sensors on each floor at the entry and exist point. The process of accessing the RFID will take time in microseconds. The multilevel car parking system that enhances the performance of saving users time to locate an appropriate parking space and reduces the general costs for moving to chosen parking area space. A multilevel car parking systems offers the greatest possible flexibility for the realization of of optimum parking solution. Developing a multistoring car parking system within a city solves the pollution problem.

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