

# SMART PARKING USING IOT

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## **ABSTRACT:**

Proliferation in the number of vehicles is leading to problems of vehicles parking at an appropriate place especially the car parking. This indirectly leads to traffic congestion. This is because of the fact that current transportation infrastructure and car park facility are unable to cope with the arrival of large number of vehicles on the road. To alleviate the aforementioned problem, authors proposed a Smart Parking Management System that helps users to automatically find a free parking space with a smaller amount. Smart Parking involves use of Ultrasonic sensor, Arduino Uno, ESP8266-01 Wi-Fi Module, Cloud server. IOT based new parking platform enable to connect, analyze and automate data gathered from devices and execute smart parking possible. Smart parking would enable vehicle occupancy, monitoring and managing of available parking space in real-time that reducing the environmental pollution. Proposed system provides optimize usage of parking space and get considerable revenue generation.

## **INTRODUCTION:**

Traffic congestion caused by vehicles is an alarming problem at a global scale and it has been growing exponentially. Car parking problem is a major contributor and has been still a major problem with confined parking spaces in urban cities. Searching for a parking space is a routine (and often frustrating) activity for many people in cities around the world. This search burns about one million barrels of the world's oil every day. These problems will get worse as the global population continues to urbanize without a well-planned, convenience-driven retreat from the car. According to a report Smart Parking could result in saving 2, 20,000 gallons of fuels till 2030 and approx. 3, 00,000 gallons of fuels by 2050 if implemented successfully. Smart Parking systems obtain information about available parking spaces in a particular geographic area. This process is real-time to place vehicles at available positions. It involves real-time data collection using low-cost sensors and mobile-phone-enabled automated payment systems that allows people to reserve parking].

The importance of smart parking is:

1. Accurately sense and predict spot/vehicle occupancy in Real-time.
2. Guides residents and visitors to available parking spot.

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3. Optimize Parking Space Usage.
4. Simplifies the parking experience and adds value for parking stakeholders, such as merchants and drivers.
5. Helps the free flow of traffic in the city leveraging IoT technology.
6. Enables intelligent decisions using data, including real– time status applications and historical analytics reports.
7. Smart Parking plays an important role in creating better urban environment by reducing the emission of CO2 and other pollutants.
8. Smart Parking enables better and real time monitoring and managing of available parking space which results in significant revenue generation.
9. Provides tools to optimize workforce management.

### **EXISTING SYSTEM:**

- No optimum use of available spaces
- Congestion may increase due to parking traffic
- Increase fuel consumption to search space
- Increases time to search space
- No Real Time parking space tracking
- No efficient revenue monitoring

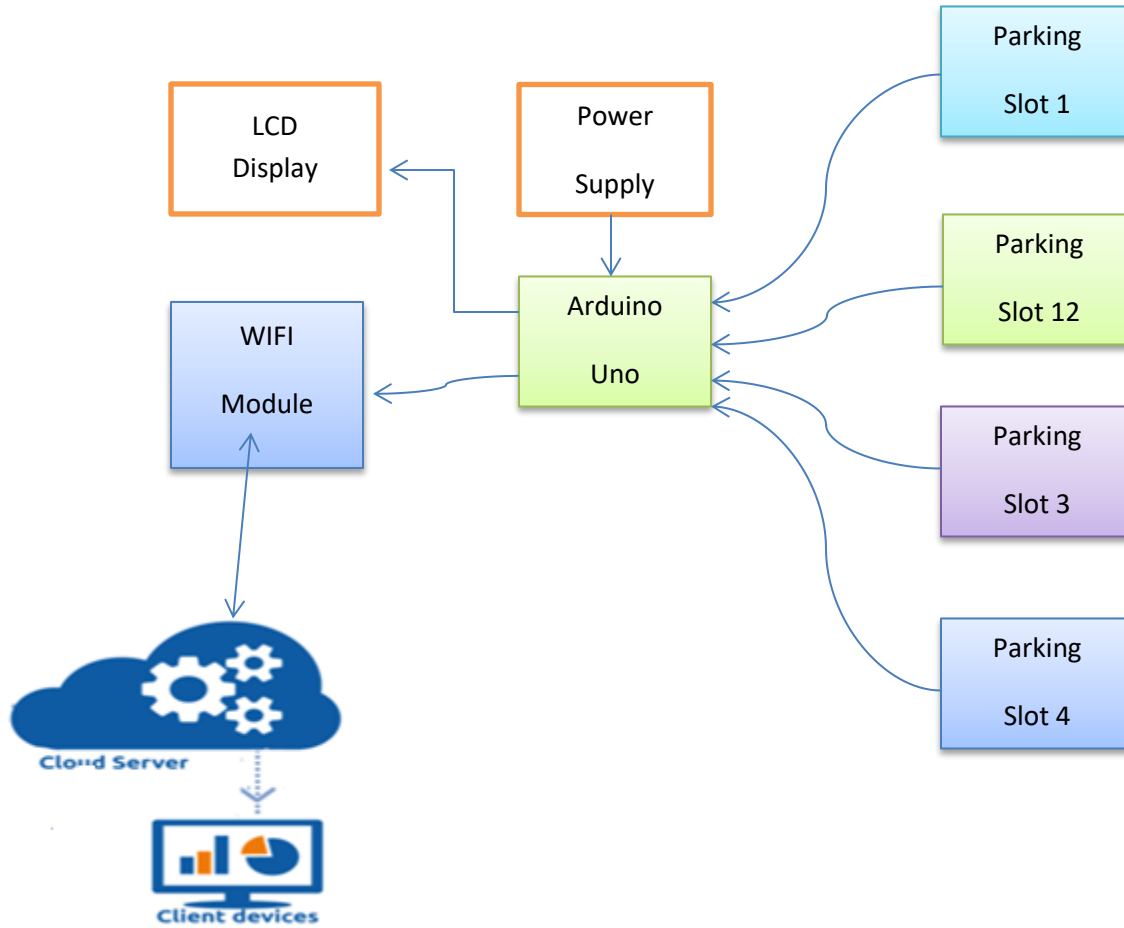
### **PROPOSED SYSTEM**

Moving towards smart city, smart parking is a very good example for a common citizen of how the Internet-of-Things (IoT) can be efficiently and effectively used in our day to day life to provide different services to different users. Proposed application is user friendly and even non-technical person can use it through mobile device. Through this application user can search a free parking slot from anywhere in the world. Proposed system provides well-organized car parking Management through isolated parking spot localization. Conventional reservation based car parking method has a limitation of space and time. Proposed smart parking system providing the free parking slot efficiently that saves time and fuel and reduces atmospheric pollution and congestion in cities. IOT based new Parking platform enable to connect, analyze and automate data gathered from devices, and execute efficiently that makes smart parking possible.

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## Block diagram:



The proposed system will have IR sensor, Arduino Uno, ESP8266-01 Wi-Fi Module, Cloud server i.e. [www.thingspeak.com](http://www.thingspeak.com), User-End Application on Smartphone. The interfacing is shown.. The ultrasonic sensor is used to determine the availability of the vehicle at the parking spot. It is connected to the Arduino Uno module interfaced with Wi-Fi shield [5]. The Arduino Uno module is connected to the cloud server through an Internet connection to transfer the data from the local car park. At the user end application a software system runs on Android operating system. The user has to install this application on their smart phones and use it to reserve parking spaces.

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## **ADAVANTAGES:**

- Provides optimum use of all available spaces
- Congestion can be decreased by diverting traffic to available spaces
- Decrease fuel consumption to search space
- Decreases time to search space
- Provides Real Time Parking space tracking
- Provides efficient revenue monitoring

## **APPLICALITION:**

- Used in malls
- Used in offices
- Used in public parking lot
- Used in public function and meeting

## **HARDWARE REQUIREMENTS:**

- IR sensor
- Embedded system board (Arduino or MSP430 or TIVA-Arm boards any one)
- ESP8266 Wi-Fi module
- Buzzer
- LEDs
- Jumper wires
- Power adaptor 12V 2amp and 9V 1amp

## **SOFTWARE REQUIREMENTS:**

- Serial terminal software like Hercules, Teraterm, Flashmagic etc.
- Embedded C compiler with IDE (Arduino, Energia, Keil etc.)
- Google Maps
- Windows XP or Higher
- Microsoft Office 2010 or higher

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