

Parking HUB

The proposed project is a smart parking booking system that provides customers an easy way of reserving a parking space online. It overcomes the problem of finding a parking space in commercial areas that unnecessarily consumes time. Hence this project offers a web based reservation system where users can view various parking areas and select the space to view whether space is available or not. If the booking space is available then he can book it for a specific time slot. The booked space will be marked yellow and will not be available for anyone else for the specified time. This system provides an additional feature of canceling the bookings. Users can cancel their booked space anytime. Users can even make payment online via credit card. After making payment users are notified about the booking via email along with a unique parking number.

Modules:

- **Admin Login:** The system is under supervision of the admin who manages the bookings made.
- **User login/registration:** Users have to first register themselves to login into the system.
- **Manager login:** add new parking areas and spaces to the system. This feature allows the system to accommodate more parking lots and expand its services to different locations.
- **Parking areas:** The system will provide users with parking areas of different locations.
- **Parking availability check:** Users 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.
- **AI-Based Number Plate Detection:** The system integrates state-of-the-art Automatic License Plate Recognition (ALPR) technology to automatically detect and read vehicle number plates. This AI-powered feature tracks

vehicle entry and exit times, accurately calculating the parking duration for each car.

- **Automatic cost calculation:** The system calculates the total cost incurred for parking based on the time that user has asked for booking.
- **Automated Payment Systems:** Implement various payment options for customers, such as cash, credit/debit cards, or mobile payment methods. Integrate with payment gateways to process payments securely and efficiently.
- **Parking cancellation:** Users may even cancel their bookings by login into the system anytime.
- **Email on successful parking booking:** When a user is successful in parking the space, the system sends a confirmation and 'thank you' email regarding the space booked.
- **Integration with Payment Wallets:** Integrate popular payment wallet services such as PayPal, Apple Pay, or Google Pay to provide customers with convenient and secure payment options.
- **Location based hub search:** The system now provides a location-based HUB search functionality that enables users to find parking areas near their desired location. Users can input their preferred location, and the system will display available parking areas in that vicinity.

User side functionality:

- **Parking Space Availability:**
- Users can check the real-time availability of parking spaces before arriving at the parking facility. This feature allows them to plan their visit and find available parking spaces easily and book and reserve the slots according to their need.
- **Reservation System:** The system allows users to reserve parking spaces in advance through the mobile app or website. They can select their preferred date and time, making it convenient to secure a parking spot, especially during busy hours or special events.

- Secure Payment Processing: The application offers various payment options, such as cash, credit/debit cards, or mobile payment wallets. Users can pay for their parking using their preferred method, ensuring a hassle-free payment experience.
- Cancellation

Admin side functionality:

- Administers parking booked
- Cancellation
- View User Data
- Feedback view and reply

manager side functionality

- View Parking Areas: Once logged in, managers can view all existing parking areas in the system. They can see details such as the location, name, current occupancy, and other relevant information.
- Add Parking Areas: Managers can add new parking areas to the system. They provide essential details, such as the location, name, and capacity of the new parking area. This functionality allows the system to expand and accommodate more parking spaces in different locations.
- Edit Parking Areas: Managers can modify the details of existing parking areas. They can update the location, name, or capacity of parking areas as needed.

Software Requirements:

- Windows 7(ultimate, enterprise)
- Sql 2005
- Visual studio 2008

Hardware Components:

- Processor – i3
- Hard Disk – 5 GB
- Memory – 1GB RAM
- Sensors
- HD camera

Advantages:

- Users can learn about parking areas for particular locations.
- It saves user time in search of parking space available in such a long parking area.
- The system provides a graphical view of the parking spaces.
- Users can pay online on the spot and confirm their space.
- It excludes the need for human efforts for managing parking spaces.
- The system generates an online bill for requested time and even sends an email.
- Cost-effective.

Disadvantages:

- It requires an internet connection.
- It requires a large database.

Applications:

- The project can be implemented in commercial areas for employee parking.
- It can be utilized by companies and organizations (hospitals, schools, colleges) to automate their parking system.
- The system can also be used in public places for public parking like in malls, stations, and so on.

future addons

- **Feedback:** The system has a feedback form, where users can provide feedback into the system.
- **Subscriptions:** Allow frequent users to subscribe to notifications that inform them when their preferred slots become available. This ensures users are promptly informed of relevant updates. Users receive notifications about

promotional offers from service providers within their locality. This helps users stay updated on discounts or special deals and encourages engagement with service providers.

- **Parking Reservations for Special Events:** Enable the system to handle parking reservations and management for special events. Allow event organizers to reserve a specific number of parking spaces in advance and efficiently allocate them to attendees.