

# ONLINE CAR PARKING RESERVATION SYSTEM

## Group 5

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For reference:

Demonstration video: <https://youtu.be/rKykvggg0Xs>

Github repository:

[https://github.com/3005coolik/Group5-Online\\_Car\\_Parking\\_Reservation\\_System](https://github.com/3005coolik/Group5-Online_Car_Parking_Reservation_System)

Website: <https://planyourpark.herokuapp.com/>

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## ❖ INTRODUCTION:

### ❑ Objective

We propose to create an online car parking reservation system where the user or the driver can book a slot beforehand, pay for the same through e-payment and then get an e-receipt on his/her mailbox. This will ease the hustle created while using the offline medium to find the right area to park the car.

Also, our system allows an individual to sign in as a parking owner and can add his/her parking area by adding the respective details and lending it for booking to others.

### ❑ Problem with the current system

Currently, most of the existing car parking systems are manually managed and they prove to be inefficient. In an urban area, the number of vehicles is higher as compared to the availability of parking spaces available and a lot of time is wasted in searching for the right parking location. Sometimes, people are unable to find a perfect parking area and this leads them to park in an unknown location. This seems to be quite unsafe and it leads to worries. So, it is a dire need to make a system online in which the user can easily find a perfect parking location according to their locality and book a slot through online mode and have a safe parking experience.

### ❑ Brief description:

To improve the efficiency of manually managed car parking systems, our project will allow users to book a slot at the ease of their homes. Through the map feature, users can easily locate the parking location. On finding the right parking area, he/she can enter the date and time and proceed with the payment process. Once the payment is successful, the user will receive an e-receipt for confirmation and the slot will be booked. The users are also allowed to provide feedback to the parking areas which the owner can view.

Also, the parking owners are allowed to add their parking areas and view the details for the same i.e he/she can view the customers currently parked in his/her area and the reviews provided by the customer.

### ❑ Scope:

Since in our country people in urban areas park their vehicles in whichever place they find an empty slot and managing the parking system manually becomes a difficult task. So, to combat this problem, our system will allow pre-booking of the slots

without creating the last-minute hustle. This system can be implemented in front of hotels, malls, hospitals, and other huge crowded places where only the users with e-Receipt will be allowed to park their vehicles. This will save a lot of time for drivers to find a safe place to park their car nearby.

## ❖ TOOLS AND TECHNOLOGIES USED:

The backend was done in nodeJs using the express.js framework. Login, registration and logout were performed using passport.js and JSON web token. For the google authentication process, we used google Oauth20. For displaying the dynamic data on the page .ejs file was used. To locate the location on the map we have used a geocoder to convert the location into longitude and latitude and displayed using map box API. For sending mail of invoice to user nodemailer library is used.

We decided to go with Nodejs as it has a wide range of open-source npm packages so we can implement various features such as maps etc. Also, many members of the group were already familiar with these technologies.

For the better styling of the ejs files and to make them responsive, we used the CSS tool and bootstrap.

## ❖ BACKGROUND:

### ❏ Users and stakeholders:

**Stakeholder:** Stakeholders are people who are invested in the project and their input will directly affect the outcome of the project.

The stakeholders of the car parking reservation system:

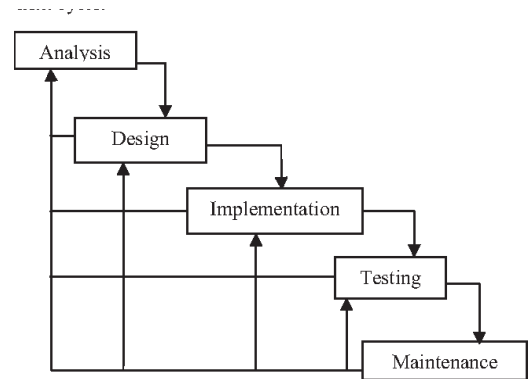
- User/ Driver
- Parking owner
- Manager/ Admin
- Project team

**User:** users are the people who interact with the application.

- Driver
- Parking Owner

## ❑ Process model used:

In this online car parking reservation system, we have used an Iterative waterfall model which is considered more efficient than the classical waterfall model. It provides feedback paths from every phase to its preceding phase. These feedback paths allow correcting errors committed by programmers during some phase. So, we will proceed in phases and at the end after the testing, the whole model will be provided to the user.



## ❑ Constraints:

### 1. Payment Constraints:

- The payment process on our website is a dummy process, as we were not able to implement the proper payment method and we were not able to add more payment methods like UPI, net banking, and others.
- As we were not able to implement the payment process on our website, so we weren't able to find a way to send the money directly to the owner on the successful payment.

### 2. Vérification Constraints:

- **Email and contact details:** The system is not able to verify the email and the contact details. Also the identity of a user or a parking owner can not be verified.
- **Payment details:** The information of the card for the verification process like cvv, card number and expiry were also not verified as a proper working payment framework was not set up.
- **Parking Location Verification:** The verification of the parking location was also not possible as we can't verify that the owner owes the land or even if it is present there. Also, if we request for the images and documents of the area they can be forged for uploading. So this process is better done manually by visiting the site and the owners.

## ❖ REQUIREMENTS ELICITATION:

### 1) Document Analysis

- Evaluation of the existing systems was done, like, <https://www.planyo.com/car-parking-booking-system.php> <https://www.parkr.in/>, wherein we got to know about the various pages of our website.
- Reviewing and confirming our collected details with the assigned mentors.

### 2) Interviews

- **Interview 1:**

Interviewee: Mr. Harshad Patel (Common Consumer)

Interviewer: Mahi Patel, Sudiksha Thusu

**Question 1:** Is it difficult for you to find a parking spot in a new space or a new city?

**Answer:** Yes, it is indeed very difficult for me to find parking in time at a new place. Sometimes parking slots are full, and we can't find a safe space to park.

**Question 2:** When you don't find the perfect place to park, where do you usually end up parking?

**Answer:** We usually park outside the place we are supposed to be, but it is very risky as we have no guarantee that it is safe. We have started using cabs and public transport to avoid this problem.

**Question 3:** If there was a website, where you can pre-book the parking, will you be using that?

**Answer:** Yes, Of course, I will use it as it will be safe and give me the details of the parking spot and pre-booking takes off the pressure to find parking.

**Question 4:** What all features do you expect from the same?

**Answer:** Advanced payment will help to save time and also for Confirmation, we can receive a receipt to handle the hustle while finding the place.

- **Interview 2 :**

Interviewee: Raj Mahla (Watchman roleplay)

Interviewer: Parthiv Patel, Nipun Patel

**Question 1:** How difficult it is to manage so many customers at a time?

**Answer:** It is too difficult to handle the parkers especially at the general high traffic times at around 10 am and at around 6 pm. Even with the support of 3 fellow watchmen, it is a tedious task to assign parking receipts and verifying.

**Question 2:** Your opinion on online parking reservations.

**Answer:** Absolutely, It is indeed a very good thing. If it somehow decreases at least the work of providing the parking receipts then it is a very good option. If we are somehow free from this work then we can focus more on traffic management which is an on-site vehicle Also in this modern time everything has gone online so I don't see any issues in taking this field online, too.

- **Interview 3:**

Interviewee: Jenil Khandhara (Parking Owner roleplay)

Interviewer: Ishang Kumar, Harshal Markana

**Question 1:** Are you comfortable with the parking system right now.

**Answer:** Not really, it is very difficult to maintain the record of the customers because there is not a proper booking system.

**Question 2:** Will you be comfortable using the parking booking system website, wherein you will be provided with the details of the customers who use your parking?

**Answer:** Absolutely yes, I will be using it. That will help me to keep track of my parking spaces.

### 3) Brainstorming

- We first understood the problem statement and as a group, we devised certain diagrams for a better understanding of tasks and issues to be solved.
- We came up with different sub-problem statements of this website, and also thought of the possible solution to them with the known technologies.
- We were constantly browsing through different websites and resources, to get an in-depth knowledge of the proposed application.
- Through the lab assignments and the lectures, we learned to put our ideas in a structured and more refined manner.

### ❖ FUNCTIONAL REQUIREMENTS:

- **USER LOOKING FOR PARKING**
  - Create Accounts
  - No. of parking areas near me
  - To view the parking status
  - Book the slot
  - Cancel the booked slot
  - Payment and Receipt Generation

- Time slot booking, duration
- Feedback

- **PARKING OWNERS**

- Create Account
- Add/Delete Parking spaces
- Edit parking spaces (details, time and parking slots, etc)
- Parking Status with details of the customers (Authentication)

## ❖ **NON-FUNCTIONAL REQUIREMENTS:**

- **USER LOOKING FOR PARKING**

- Atomicity (for payment)
- Secure data (personal information)
- Reviews (reliability)
- The site does not crash, the system should be effective with an increase in the number of users too (scalable)
- Fast response time
- Fast recovery from the disconnection
- 24x7 availability
- Users should be provided with a guide for the same. (User-friendly)

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## ❖ **USE CASE MODEL:**

### **USE CASE DESCRIPTION:**

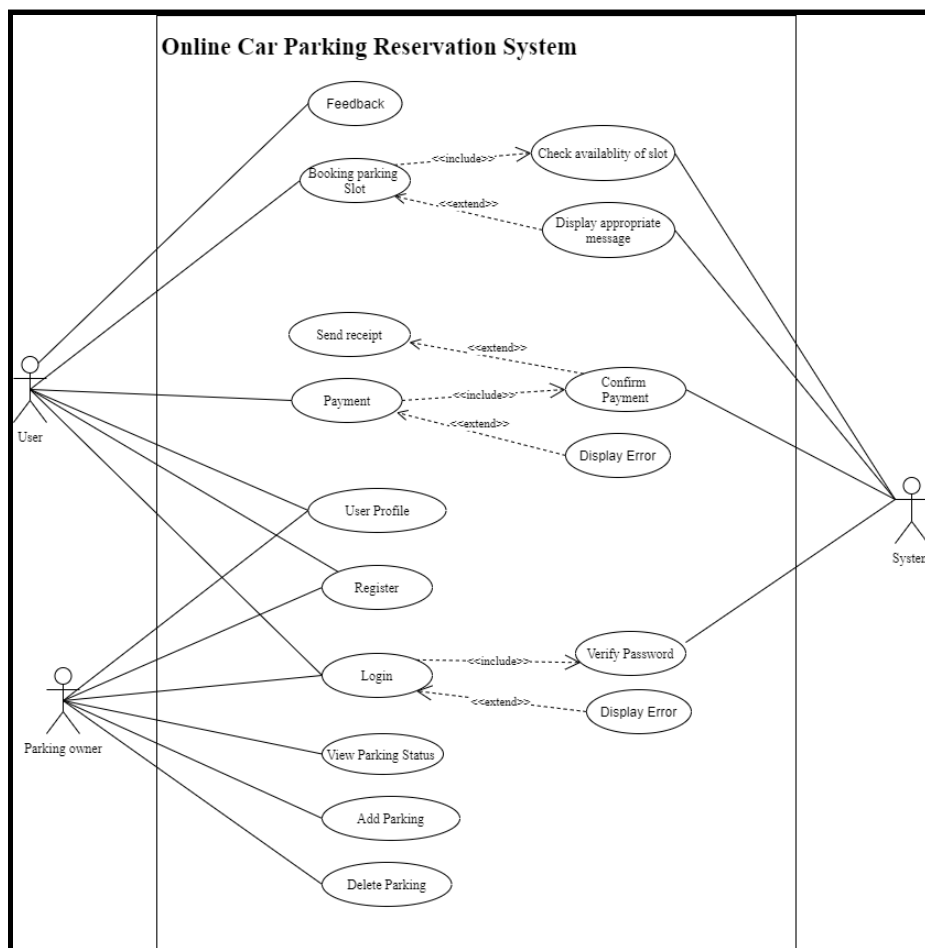
Based on the functional requirements we came up with different use cases which we depicted in the use case diagram.

In this car parking reservation system, we have 2 user classes.



**USER:** The user will be the one who would reserve the parking slot. To do so, he/she would be prompt to register in the system by entering the contact information. On the login, the user will enter the location and find the nearby parking slots. On finding the same, the user would select the preferred time duration. Based on that, he/she will be able to view the available parking slot and on selecting one, he/she can enter the vehicle details. Once that is done, he/she will be asked for the payment and after a successful transaction, an e-receipt would be generated. Henceforth the booking will be confirmed. The user can review and give feedback on the parking areas too.

**PARKING OWNER:** The parking owner would be one who would add his/her parking areas to be used for the reservation. He/she would register in the application as the parking owner. In doing that, he can add the details and photos of the parking area along with the slots allowed. He/she would also have to enter the fares of the parking and view the status of the vehicles placed in the parking slot. He also has the right to remove the parking area. The parking owner can view the feedback of the users.



Link: [Use Case](#)