Project Proposal

Car Space Renting System

COMP9900-9900-H11A-Team Winning5

Car Space Renting System

UNSW SYDNEY

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1. Background

1.1. Problem Overview

In our urban cities, the ratio of parking spaces to drivers is approximately one for every six. This scarcity of parking spots makes finding one nearly impossible. Surprisingly, there is a significant amount of unused parking spaces throughout the day that remains hidden, locked away, and privately owned. Instead of constructing more unattractive parking lots, it's time to optimize the utilization of existing untapped spaces. This is where the Care Space Renting System comes in.

1.2. Existing Systems and Their Drawbacks

Feature	Parkhound[1]	Sharewithoscar[2]
Home page	1. Search bar based on address for daily and monthly booking. 2. Recommend some popular CBD and suburbs. 3. Introduce the website with consumers' reviews.	1. Search bar based on address. 2. Recommend some popular locations with prices, favorable rates, and descriptions.
Searching function	1. The user can search for the required parking places by typing location in the search bar. 2. The user has the option to apply filters to the search results, including price, type, distance, instant availability, EV charging, and disabled access. 3. A map displays the parking prices and locations near the provided address.	1. The user can search for the required parking places by typing location in the search bar. 2. The user has the flexibility to apply filters to the search results, including sorting by starting time and ending time, as well as sorting options by price or distance. 3. A map displays the parking prices and locations near the provided address.
Booking function	1. Provide detailed information about the parking space, including its availability, location, size, amenities, pricing, and any additional relevant details. 2. Several pictures showcase the parking space.	1. Provide detailed information about the parking space, including pricing, description, maximum vehicle size, access method and owner's information. 2. Several pictures

	3. The user can easily send a booking request by entering their payment details and vehicle information.	showcase the parking space. 3. The user can easily send a booking request by entering their payment details and vehicle information.
User page	1. Provide a basic profile page and integrates personal income, bookings, listings and other information in the dashboard. 2. The billing column is set and allows users to add or change bank card information. 3. The overall design is centered, and a star icon is set on the left menu bar to remind new content.	1. Provides bookings, my spots, and other basic information, and adds a promotion column. 2. The account balance is set, and different payment bank cards and paid bank cards are supported, and automatic recharge can also be set. 3. The overall design on the left and only provides the most basic information.

By analyzing and comparing the two websites, several issues and problems can be identified.

①To enhance the search results when looking for parking spaces, additional filters can be incorporated, such as space size and rating. Including these filters allows users to narrow down their search based on their specific requirements, ensuring they find parking spaces that align with their preferences in terms of size and quality. By expanding the available filters, users can have more control over their search results and find parking spaces that best suit their needs.

②There are no reviews or ratings available from previous users for the specific parking space. Having reviews for specific parking spaces benefits both users and parking space providers. It facilitates informed decision-making, builds trust, and promotes the improvement of parking services based on user feedback.

③The user interface should be designed to be simple and clear, highlighting the information that users are most likely to care about. For parking space rental websites, the reserved parking spaces should be clearly displayed.

2. User Stories and Sprints

2.1 Project objectives

1.all users of the platform should register their account and fill in the personal information.

2.the consumers are allowed to view the car parks in the region and within the prize they prefer.

3.the providers can register a new empty car park and give the information of the car park to match the consumer.

4.the users can view the details of one car park.

5.the location of car larks will be shown through the google map.

6.the admin has the right to delete or update the information of one car park with privilege.

7.the consumer can book the car park if the car park is available at that time, and the system will calculate the fee automatically.

8.the system will automatically pay the money to the providers' bank account when the order finish.

9.the costumers are allowed to cancel the order before the order start.

10.the users can view the history order and the consumer can leave a rating to a car park when one order finish.

2.2 User stories

2.2.1 User type

- Provider – Users who want to rent out their parking space through the website.
- Admin - Users with high level privileges and the ability to manage the system, eg:update the information of a parking space.
- Consumer – Users who want to rent a parking space through the website.
- System

2.2.2 User Stories Table

The table below shows a table of the user stories presented in this project.

User	User Stories	Acceptance Criteria
Provider 1	As a provider, I want to register new parking spaces and update them to the platform so that they are available for consumers to view and book.	Providers can register new parking spaces and enter parking space information: ● Title ● Address ● Photos ● Space type ● Way to access ● Description ● Size of parking space ● Vehicle type ● Price per hour and per day ● Availability

Provider 2	As a provider, I want to be able to manage my parking information and fix existing parking information so that I have control over the accuracy and updates of the parking details.	Users can view and change their existing parking space information, or add new parking space and delete existing parking space.
Provider 3	As a provider, I want to be able to receive the rent fee that is due to me so that I can ensure that the platform pay me the earning timely and consistent for my property be rented.	The system can pay the earning to provider through the bank account (with 15% service fee).
Provider 4	As a provider, I want the system to automatically accept available reservations instead of requiring me to manually confirm, so that it would be very convenient for me.	The system can accept reservations for parking spaces based on availability.
Provider 5	As a provider, I want the system to automatically terminate the user's reservation if the consumer doesn't pay in time after booking, so that i can be paid more conveniently.	When a consumer pays for an order during the window period, there is a 5-minute countdown, after which the system must be able to automatically cancel the unpaid booking.
Provider 6	As a provider, I want the system to recommend my parking space to potential consumers, so that it can increase the chances of attracting interested users.	Consumers will receive the recommendation from the system based on their current location, and they will be showed on the first page and be obvious.
Admin	As an administrator, I want to be able to view, edit, and delete existing parking spaces in the database, so that I have full control over managing the available parking spaces.	The system allows the admin to manage the existing parking spaces,like deleting,editing,viewing the information of the existing car parking spaces.
Admin 2	As an administrator, I want the system to authenticate providers, consumers, including administrators, before any sensitive information is updated, so that it ensures security and prevents unauthorized access to sensitive data.	The system can authenticate administrators, providers and consumers before a user can update any sensitive information. Authentication is carried out by human verification.
Consumer 1	As a consumer, I want to be able to pay my bills online, so that I can conveniently manage my payments without the need for physical transactions.	The platform allows the consumers to pay for the order through their bank account.
Consumer 2	As a consumer, I want to register for the service and input my personal and vehicle details so that I can create an account and provide the	Consumers can register for the service and enter personal information and vehicle details: ● Name

	necessary information for a smooth user experience.	• Phone number • Email • Password • Vehicle type • Bank account detail
Consumer 3	As a consumer, I want to be able to find a car space from the list of registered parking spaces in the system, so that I can easily locate and choose a suitable parking spot.	The consumer can search or filter from the list of car spaces in the system to find a car space: Filter: • Price • Space type • Distance to the search place • Way to access • Vehicle type
Consumer 4	As a consumer, I want to be able to view the details of the selected parking space, so that I can gather relevant information about the parking spot such as location, availability, and pricing.	Consumers can view the details of the parking spaces by opening the individual page for a parking space: • Title • Address • Photos • Space type • Way to access • Description • Size of parking space • Vehicle type • Price per hour and per day • Availability • Rate and comments
Consumer 5	As a consumer, I want to be able to book an available car space and specify the duration of the booking, so that I can secure a parking spot for a specific period of time according to my needs.	The consumer can freely select the booking date from the available booking times and the system will calculates the price automatically.
Consumer 6	As a consumer, I want to be able to view the list of orders and have the option to cancel the reserved parking space, so that I can manage my bookings and make changes if needed.	Consumers can view their order history and cancel orders from their order history 24 hours before the starting time of the order.
Consumer 7	As a consumer, I want to be able to browse my own bookings, rate and review the spaces I have booked by providing ratings on the platform, so that I can share my experiences and feedback with others in the community.	After completing an order, consumers can view the order, give it a rating and write a review for the parking space. The system can display the ratings and comments for the parking spaces.

Consumer 8 (novel)	As a consumer, I want to be able to bookmark my favorite parking spaces, so that I can easily access and find them more quickly whenever needed.	Consumers can bookmark a parking space at any time while browsing the list of spaces and can manage their own list of favorites.
Consumer 9 (novel)	As a consumer, I want to be able to earn points for each of my historical orders, which will grant me discounts on subsequent orders, so that I can enjoy benefits and savings as a loyal customer.	On the checkout page, consumers can see their current accumulated points and choose whether to use them to pay off a part of their order.
Consumer 10	As a consumer, I want to be able to know the exact cost of the reservation I want to make, so that I can have full transparency and clarity regarding the pricing before confirming my booking.	On the checkout page, the total cost of parking can be calculated based on the duration of the booking.
Consumer 11	As a consumer, I want to be able to pay online directly after selecting the desired booking date, so that I can conveniently complete the payment process without any additional steps or delays.	The consumer can successfully jump to the payment page after selecting the scheduled date.

2.3 Sprints

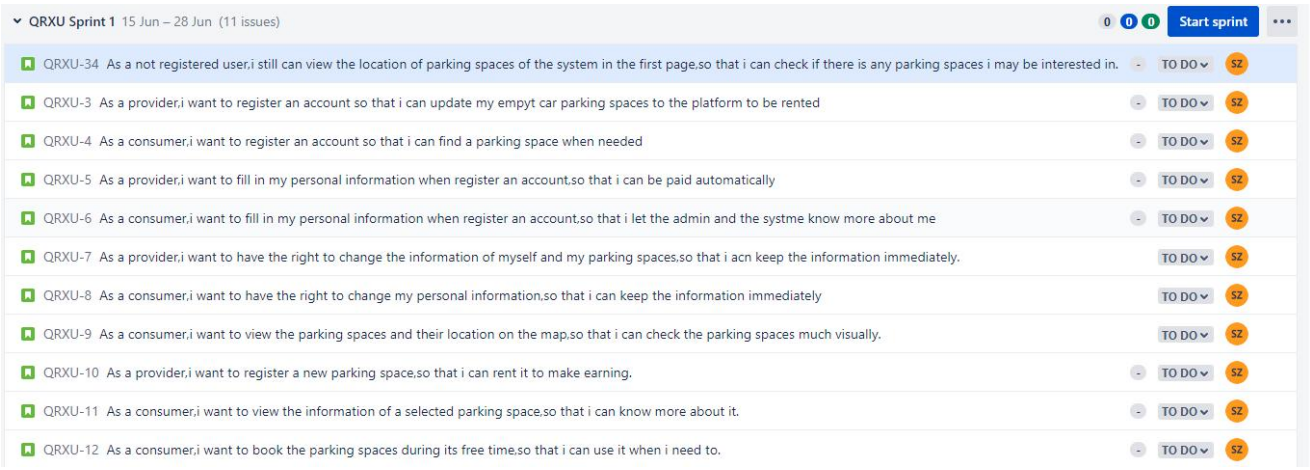
Our project follows a sprint cycle that lasts approximately two weeks. These sprints serve as checkpoints for showcasing our progress, with demos scheduled in week 5, 8, and a final presentation in week 10. The duration of each sprint is determined by the lab time allocated for the demo, dictating the end date for each sprint.

Sprint	Start Date	End Date	Sprint Scope
1	15/June	28/June	Define the website architecture and technology stack. Design and implementation of the basic user interface (UI) and user experience (UX). Homepage structure of the webpage, and some car park rental interfaces, user registration and login interfaces, user information interfaces. Create database architecture and determine data structure for storing car park information and user information. Basic functionality should be implemented, such as user account registration and login functions, and parking space list display.
2	29/June	19/July	During this phase, the core functionality of the website is developed and implemented. Implementation of parking space search and filtering functions, including filtering parking spaces by various filtering criteria. Development of parking space booking and payment functionality. Implemented the ability

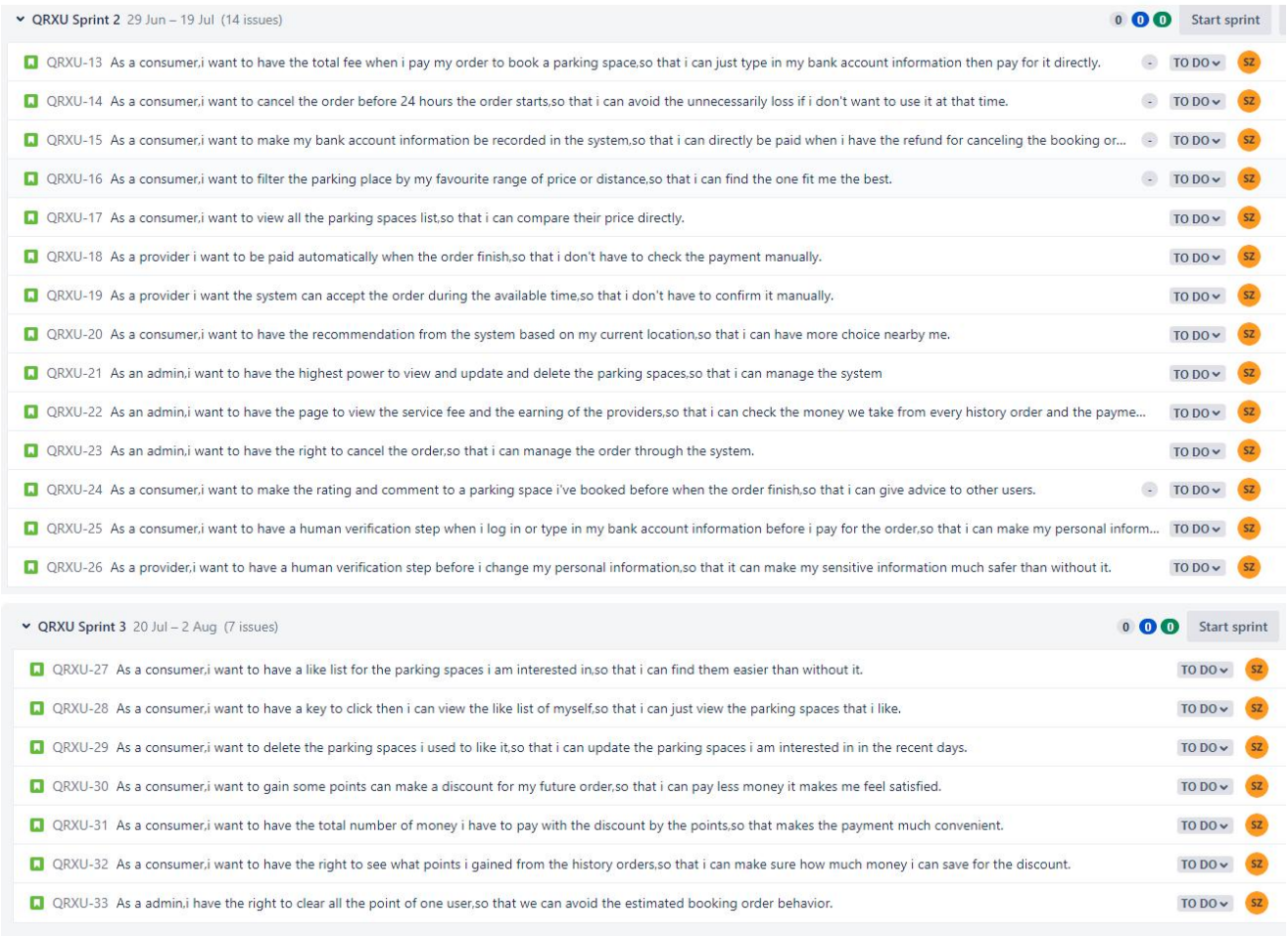
			to view parking space details, book spaces and pay for orders. Finally, complete with user reviews and feedback on parking spaces. Users can rate parking spaces and get recommendations for parking spaces.
3	20/July	2/August	The rest of the features should be implemented in this final sprint. Improve the security and stability of the site and deal with possible security vulnerabilities and performance issues. Implement a back-end management system for users and administrators, manage order information, and conduct comprehensive testing of the site, including functional, performance, and user acceptance testing.

2.4 Jira Screenshot

Sprint 1



Remaining Sprint



2.5 Novel Functionalities

①Favorites list

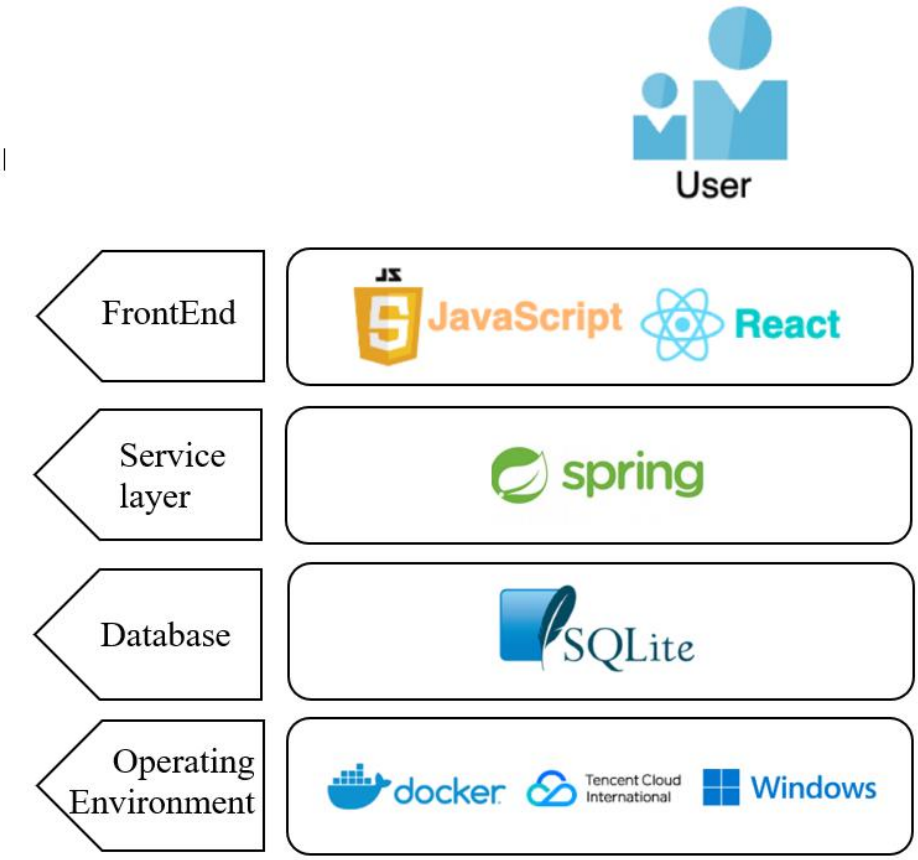
Add a favourite button to the details page for each parking space to enable users to easily add that space to their favourite list. When the user clicks on add to favourite, the space will be added to their favourite list; when the user clicks on remove from favourite, the space will be removed from the list. Provide a dedicated page or area for users to display a list of their favourite spaces. This list can be displayed in the order of the user's favourite and provide basic information (such as location of the space, price etc.) as well as links to the details page. Also, users can share parking spaces with others via the favourite list.

②Points crediting function

Create a points system that allows users to earn points after making payments on the website. Users can accumulate points to earn entitlements against their rent. Set a ratio of points to the amount of rent to be deducted. For example, every 100 points can be credited against $10 of rent. When the user pays the rent, provide an option for them to choose whether to use points for crediting or not. The user can decide whether to use points to reduce the actual amount paid based on their needs and points balance and can see the final amount paid after using points for crediting on the payment page or order confirmation page. Provide a page or area for users to display their points balance and points history. Users can view their points balance at any time and see how they earned their points and how they can use them for crediting.

3.Technical Depth and Scale

3.1 Software Architecture Diagram



The parking space rental system is an online platform that provides users with the service of renting private parking spaces or providing parking spaces for rental. Users can browse the available parking spaces in the surrounding area on the website and make or cancel reservations. Users can also use the search function to filter and quickly find parking areas that meet the requirements.

In terms of front-end, the parking space rental system adopts the React framework and uses a componentized development approach to improve the maintainability of the code. In order to facilitate user use and improve user experience, the application integrates Google Maps and uses the React Google Maps library to provide support, allowing users to easily view the location of parking areas and the surrounding environment. In addition, in order to beautify the user interface, the parking space rental system uses the Material UI framework and Sass preprocessor.

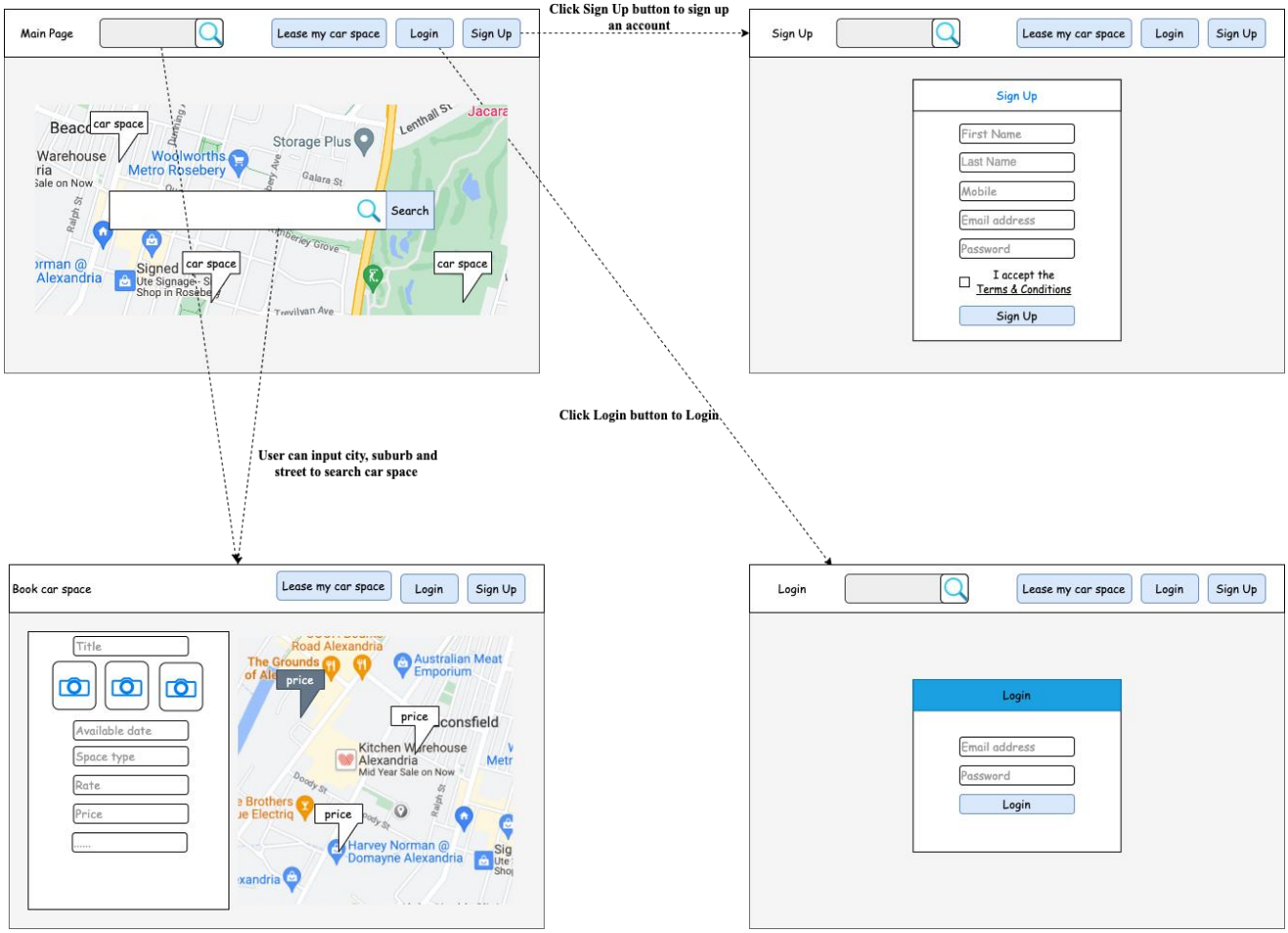
In terms of back-end, the parking space rental system uses the Spring Boot framework to simplify service deployment and JPA to simplify database operations. In addition, in order to improve the security of applications and prevent robot automation attacks, the system can use the React Google Recaptcha plugin to achieve human-machine verification. Meanwhile, in order to improve the user experience, the parking rental system can use the React Router library for routing management, providing better navigation and user interface operations.

In short, the parking space rental system is a powerful and easy-to-use online platform that provides users with convenient parking services. Adopting modern technology and framework, the system provides comfortable, fast, and safe parking services to help users better manage their travel plans.

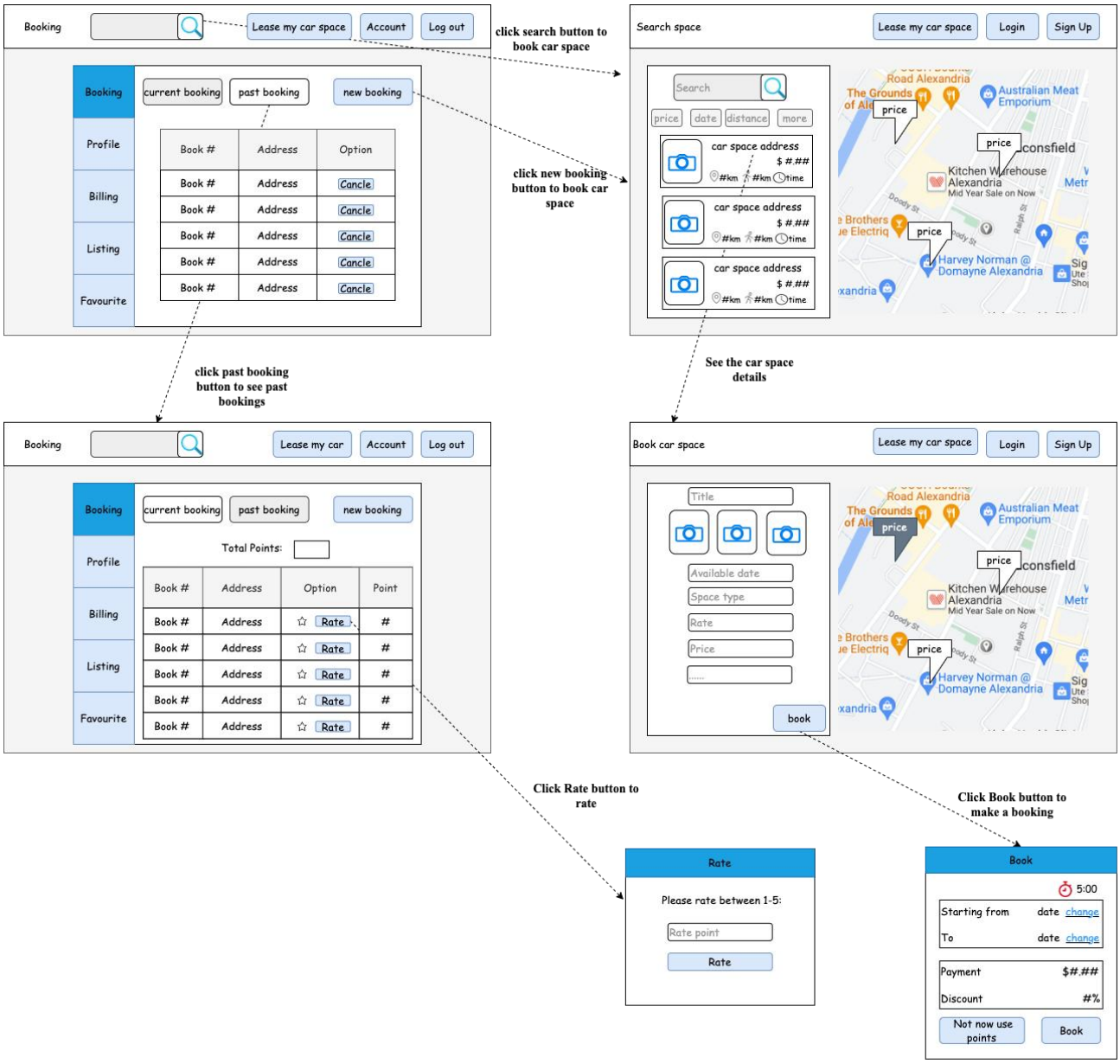
4.User Interface and Flow Diagram

4.1 Consumer

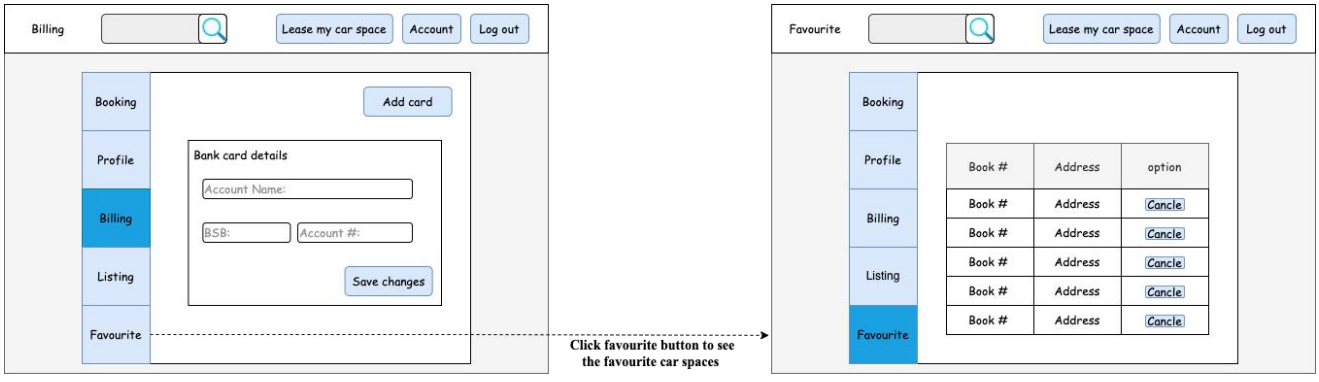
4.1.1 Main Page



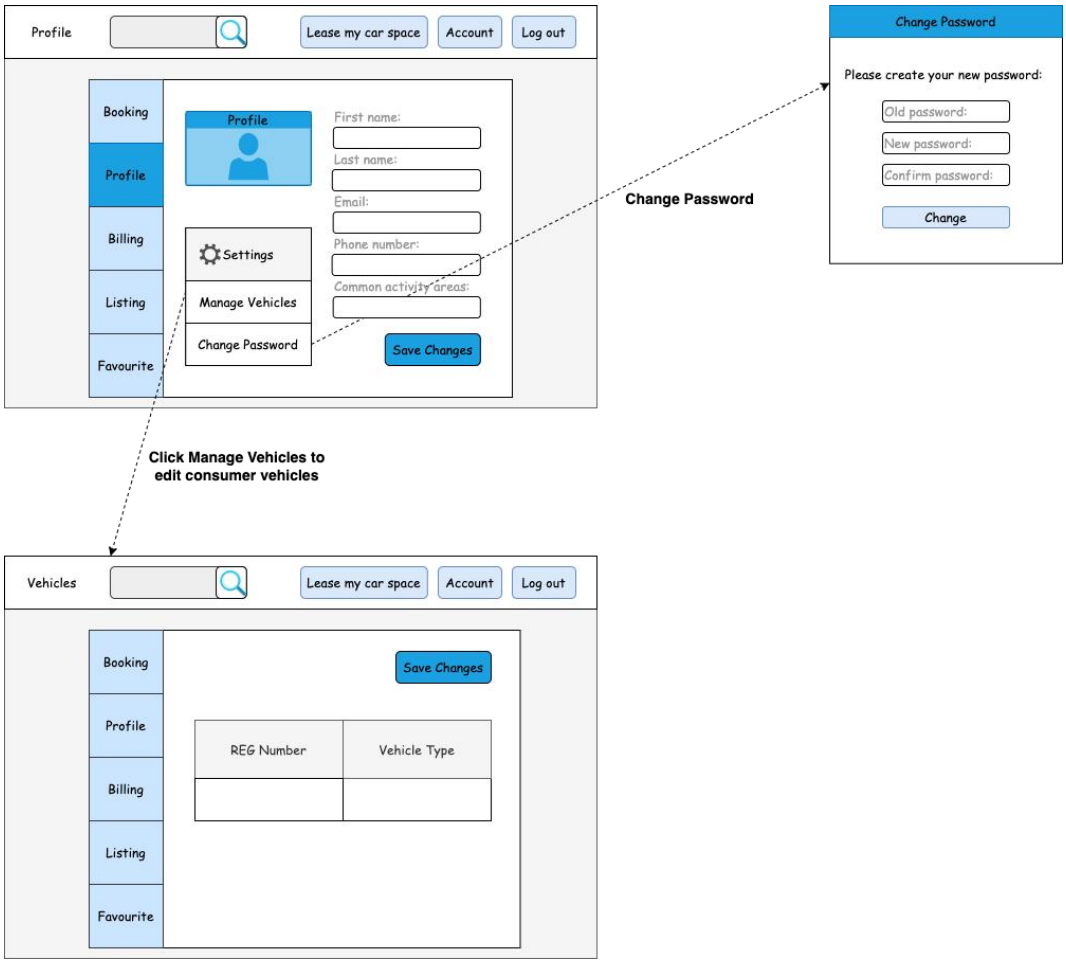
4.1.2 Booking Page



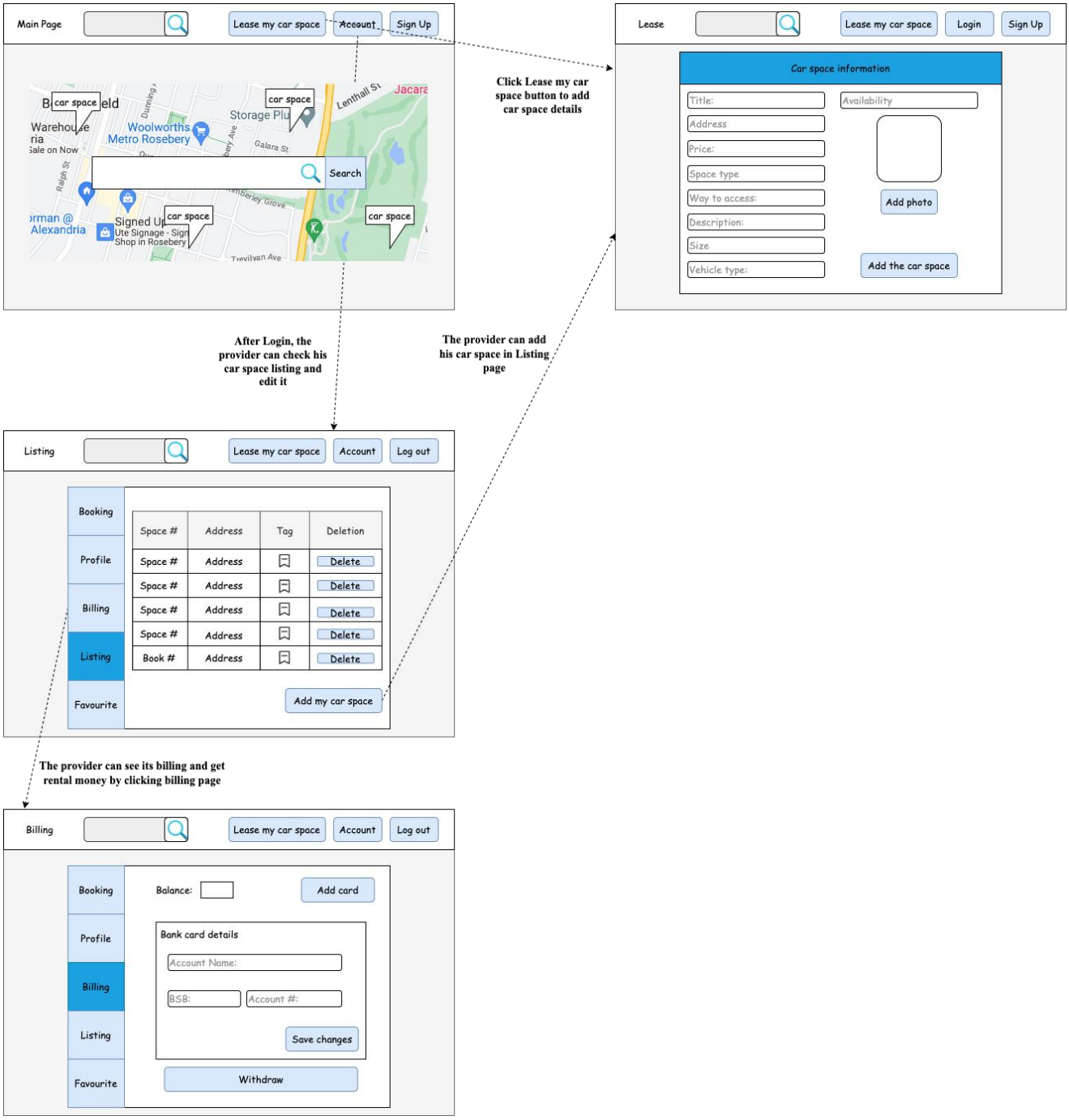
4.1.2 Billing and Favorite Page



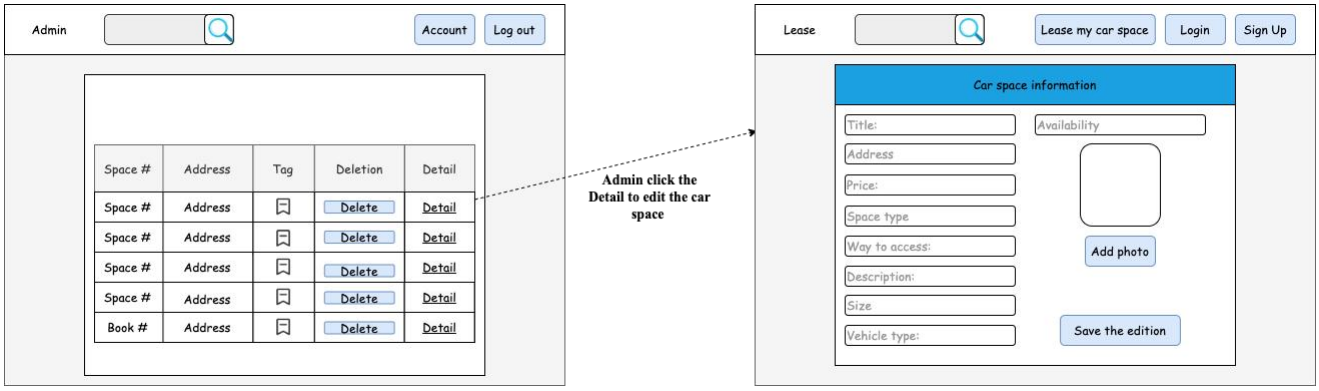
4.1.3 Profile Page



4.2 Provider


Main Page
Lease my car space
Account
Sign Up
car space
Search
Lease
Login
Car space information
Title:
Availability
Address
Price:
Space type
Way to access:
Add photo
Description:
Size
Vehicle type:
Add the car space
Click Lease my car space button to add car space details
After Login, the provider can check his car space listing and edit it
The provider can add his car space in Listing page
Listing
Booking
Profile
Billing
Listing
Favourite
Space #
Address
Tag
Deletion
Delete
Book #
Add my car space
The provider can see its billing and get rental money by clicking billing page
Balance:
Add card
Bank card details
Account Name:
BSB:
Account #:
Save changes
Withdraw

4.3 Admin


Admin
Account
Log out
Space #
Address
Tag
Deletion
Detail
Space #
Address
Delete
Detail
Book #
Admin click the Detail to edit the car space
Lease
Lease my car space
Login
Sign Up
Car space information
Title:
Availability
Address
Price:
Space type
Way to access:
Description:
Size
Vehicle type:
Add photo
Save the edition

5.Reference

[1]https://www.parkhound.com.au/

[2]https://www.sharewithoscar.com.au/