# SOFTWARE DESIGN DOCUMENT

## ON-CLOUD PARKING MANAGEMENT SYSTEM

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# İçindekiler

# 1.Introduction

## 1.1 Purpose

The On-Cloud Parking Management System aims to find reliable parking spaces for their vehicles in the shortest time and easily where they want to go. When the vehicles wandering to find a parking space can easily find a parking space, it will have a little effect on the reduction of the traffic problem in big cities. In addition, it will create a tracking and management system for parking lot owners.

## 1.2 Scope

The Software Design Document will include the general description and features of the project, design constraints, overall system architecture and data architecture, our current progress, and a brief description of the project's schedule. The design of the system and its subsystems will be explained visually with the help of UML diagrams to help the programmer understand all the information stated in this document accurately and easily.

## 1.3 Definitions, Abbreviations, Acronyms

| SDD | Software Design Document |
|---|---|
| UML Diagram | Unified Modeling Language |
| IEEE | Institute of Electrical and Electronics Engineers |
| Use Case Diagram | Represents user's interaction with the system. |
| Sequence Diagram | A sequence diagram is the most commonly used interaction diagram. |

## 1.4 References

IEEE. IEEE Std 830-1998 IEEE Recommended Practice for Software Requirements

Specifications.

IEEE Computer Society, 1998.

## 1.5 Overview

The Overview section, of this document gives an overview of the functionality of the product. It describes the formal requirements and is used to for the technical support in the next chapter.

# 2. Design Considerations

## 2.1 Approach

Important points were taken into consideration while designing the WWTTMS project. This project is aimed at resolving the requests of the user in the fastest and most reliable way. One of the most important points discussed in the user section is that when the user starts using this application, the screen description is detected without difficulty. As shown in section 5.2.1, the implementation is understandable and simple for people of all structures. Every effort has been made to keep the personal data entered by the user securely and to work without errors. The structure shown in 5.2.2 was designed with the necessary conditions in order to facilitate the work of the working chief for this system. The structure shown in 5.2.3 is designed so that there is no business complexity between teams and different teams do not work on the same problem.

## 2.2 Tools Used

- Django for framework
- PostgreSQL for database
- Python
- Flutter For GUI

## 2.3 Constraints

Since it is a mobile application for application visuals presented to the user, there will be maximum efficiency on the restricted screen. The user will be kept busy in order not to lose the user during delays in the application. (*ex.* transition from blurry to sharp image.)

## 2.4 Assumptions and Dependencies

We assume that users will provide correct and complete data to be entered while signing up for our application. If there is an incorrect login, it is the user's duty to make the necessary corrections with the guidance of our system.

Our application will first be designed for Ankara parking lots. Our first version is not available for potential users in other provinces.

# 3. Architecture

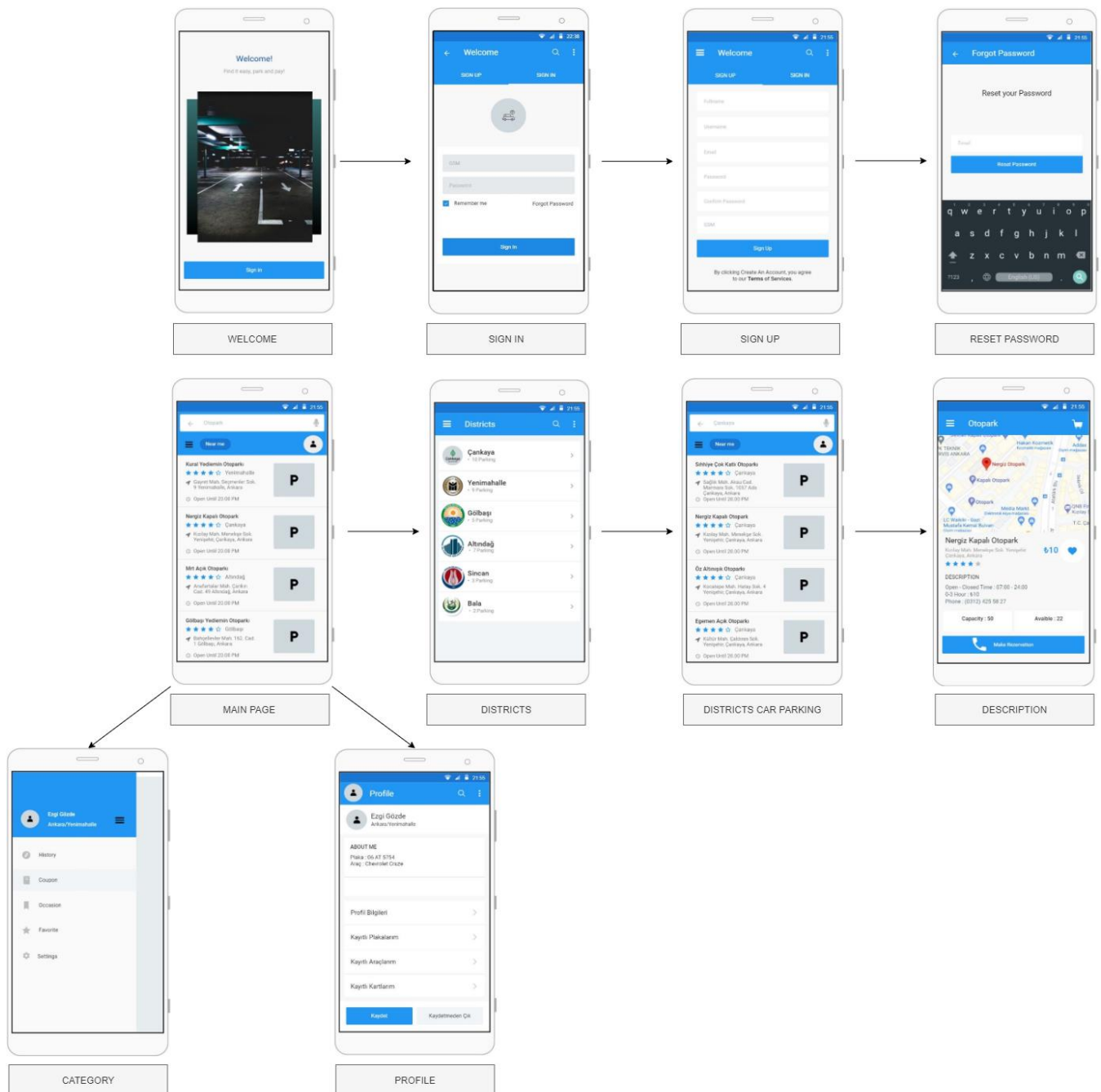## 3.1 Software Architecture
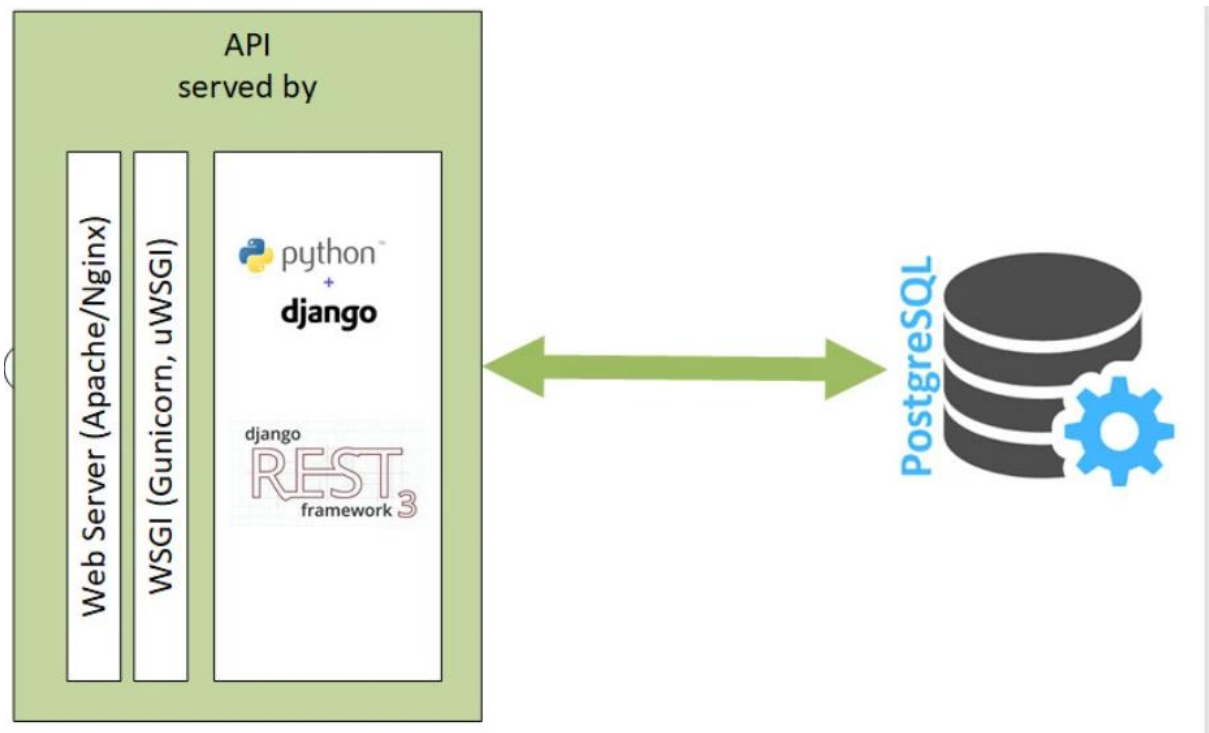


## 3.2 Hardware Architecture

# 4. System Interfaces
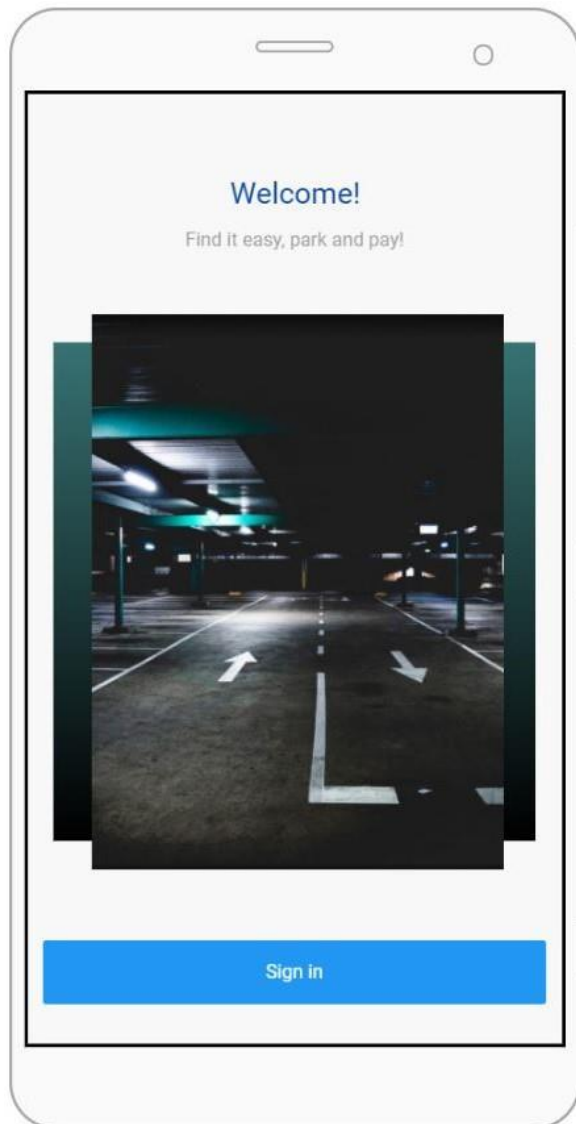
## 4.1 External System Interfaces

Our system interacts with the external system called Google Map Platform API. Within the parking service to be offered to the user, the closest parking lot to the user, the parking lot information arranged according to the districts, the location information of the parking lots will work on this platform.

# 5. User Interface Design

## 5.1 Navigation



| | | | |
|---|---|---|---|
| WELCOME | SIGN IN | SIGN UP | RESET PASSWORD |

| | | | |
|---|---|---|---|
| MAIN PAGE | DISTRICTS | DISTRICTS CAR PARKING | DESCRIPTION |

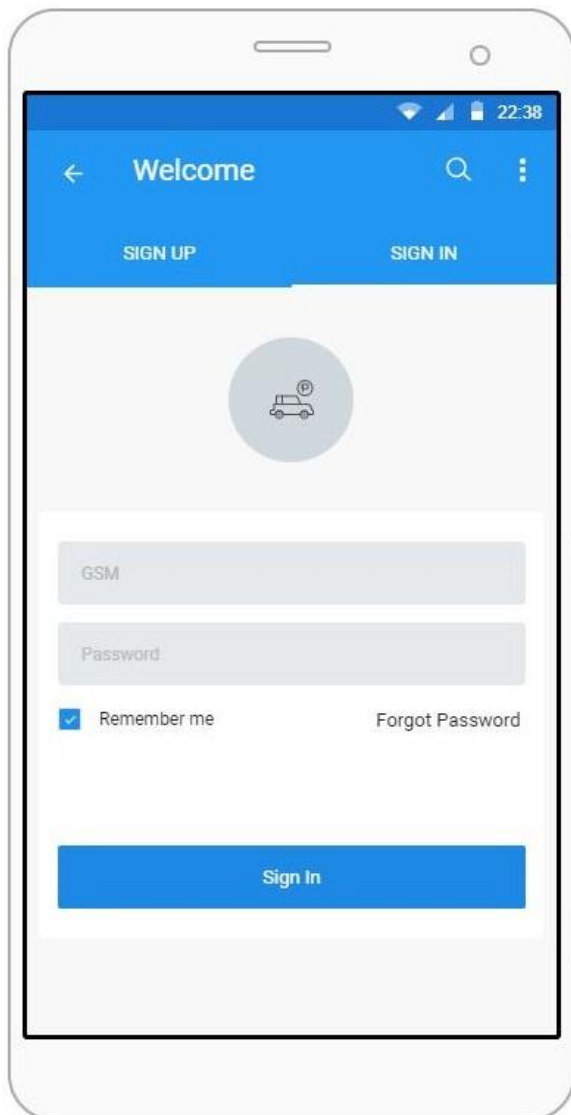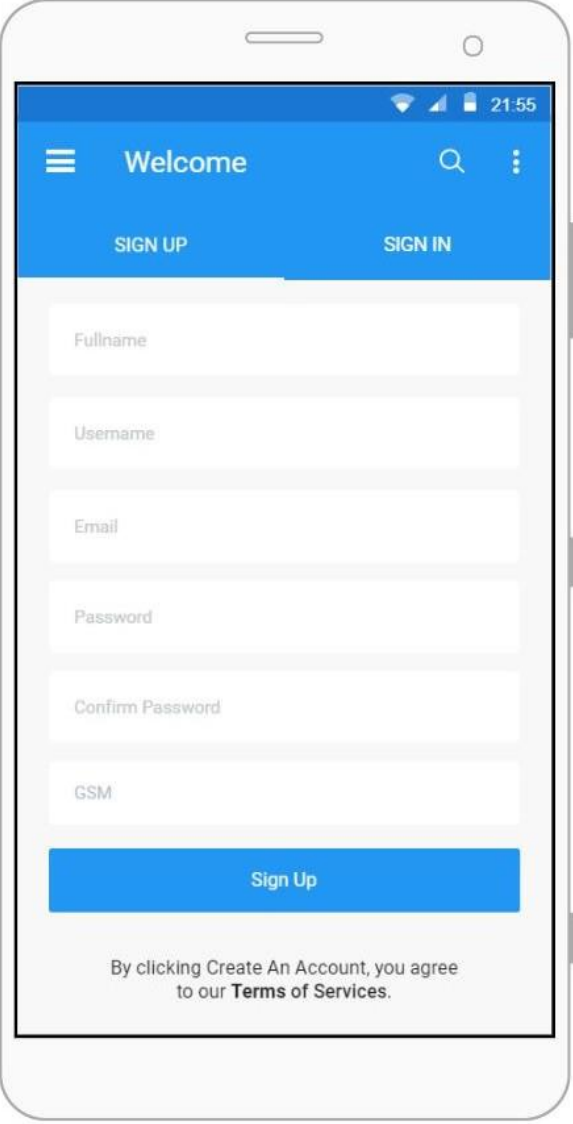| | |
|---|---|
| CATEGORY | PROFILE |

## 5.2 Screen Definitions



When the application is first opened, the user is greeted with a Welcome page. If he is a registered user, he/she is directed by the 'Sign In' button.

## 5.2.1 Sign In



The registered user logs in by entering his/her GSM number and password to log into the application.

## 5.2.1 Sign In

## 5.2.2 Sign Up



The user who is not registered in the application registers to the system by entering the First name, Last name, E-mail, Password and GSM numbers respectively. To verify the gsm number, an activation code is sent to the number entered, the user activates his registration by entering this code. E-mail information, on the other hand, is prompted for a reliable password reset when the user forgets his password.

## 5.2.3 Forgot Password
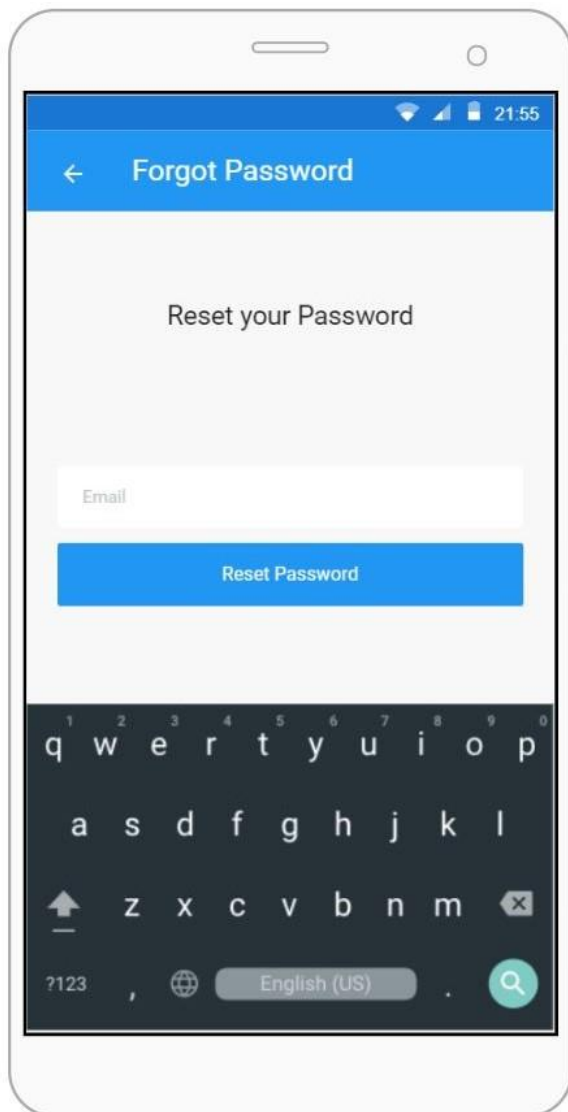


When the registered user forgets his password, he is directed to this screen and writes the e-mail address he entered while registering the application. The link to the e-mail is directed to the new password creation section.
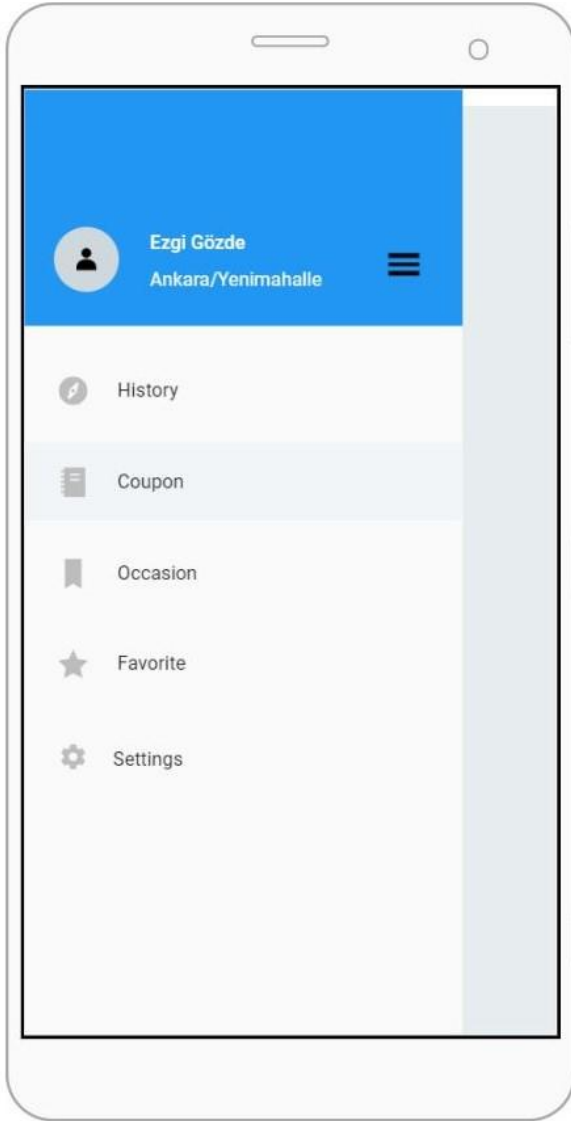
## 5.2.4 Main Screen
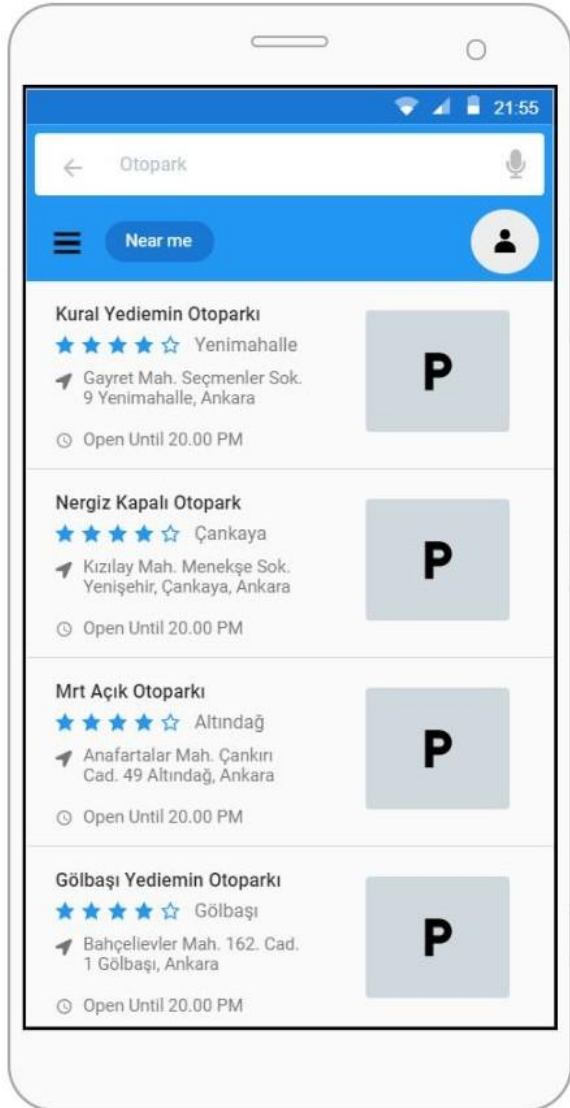


It is the first screen that the registered user will encounter when entering the application. In this section, it is listed with the top 5 parking features that have received the highest appreciation in Ankara. These features include the name of the car park, its photograph, if available, star rate, location and closing time.

With the Near me button, the closest parking lots are shown to the user.

With the selection box on the upper left corner of the screen, the category screen shown in 5.2.5 will open.

By pressing the profile box in the upper right corner of the screen, the user will open the profile screen shown in 5.2.6.

## 5.2.5 Category



This screen opened with the main screen contains the History, Coupons, Occasions and Favorites.

User history searches in the history section,

Discount coupons that can be used as a result of agreements with parking lots in the Coupon section,

Discounts or campaign news about parking lots in the Occasion section,

In the Favorite section, it contains user-favorite parking lots.
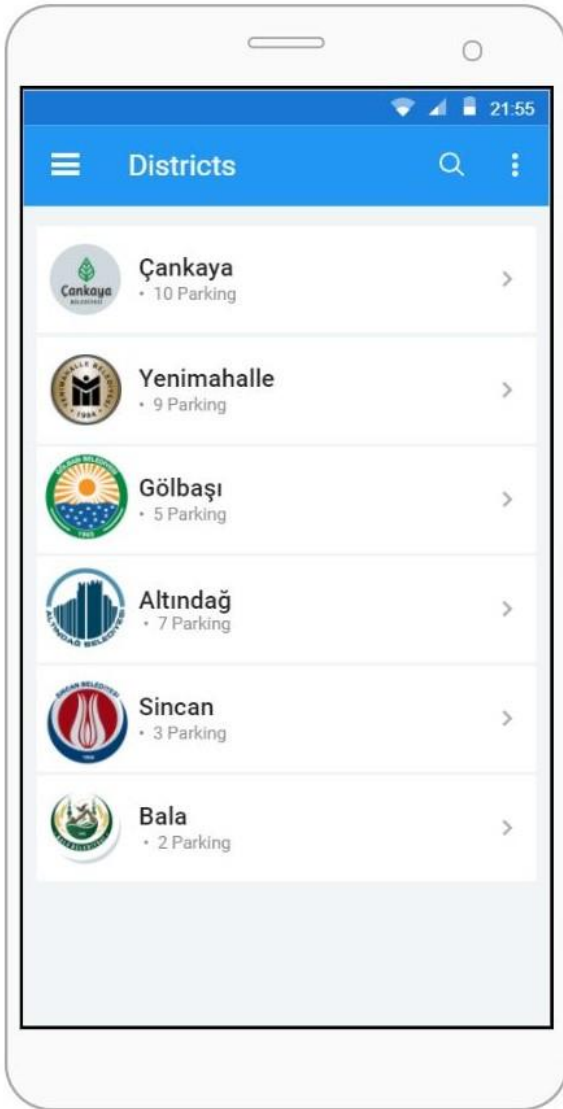
## 5.2.6 Profile
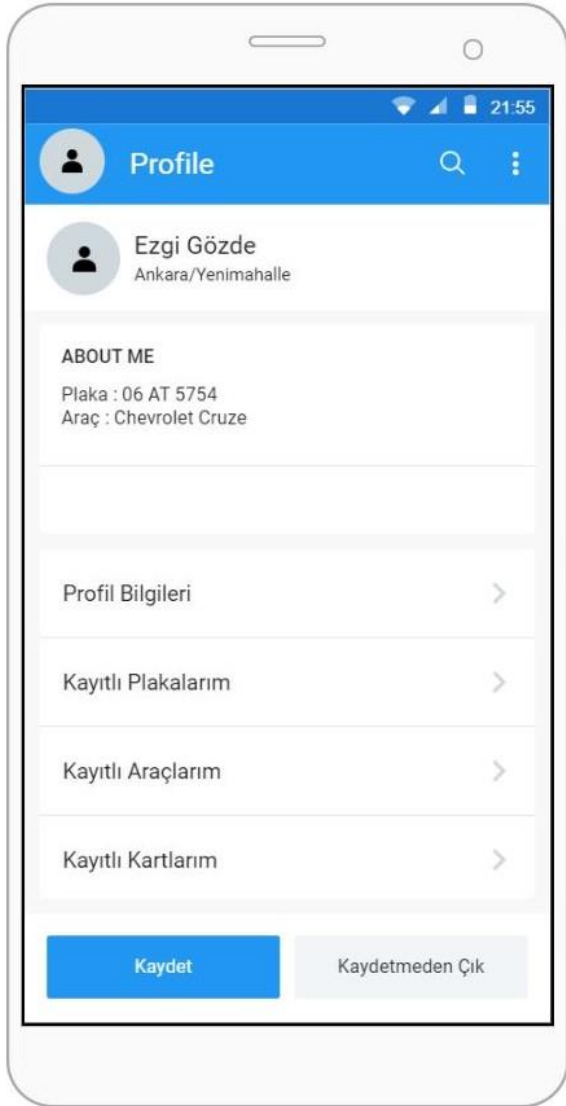


On this screen, the user can view and update their personal information.

The information on the screen includes the user's vehicle license plate and model.

If the user wants to enter more than one feature for the license plate and model, they can add and update from the recorded information section.

## 5.2.7 Districts



The application has categorized the districts in its first version for ease of use. The user accesses this screen with the search button on the main screen shown in 5.2.4. Since the first version is limited to Ankara province, districts in Ankara are listed on the screen. The user can easily choose the area where he / she wants to park his vehicle and limit his choice.

## 5.2.8 Find Car Parking
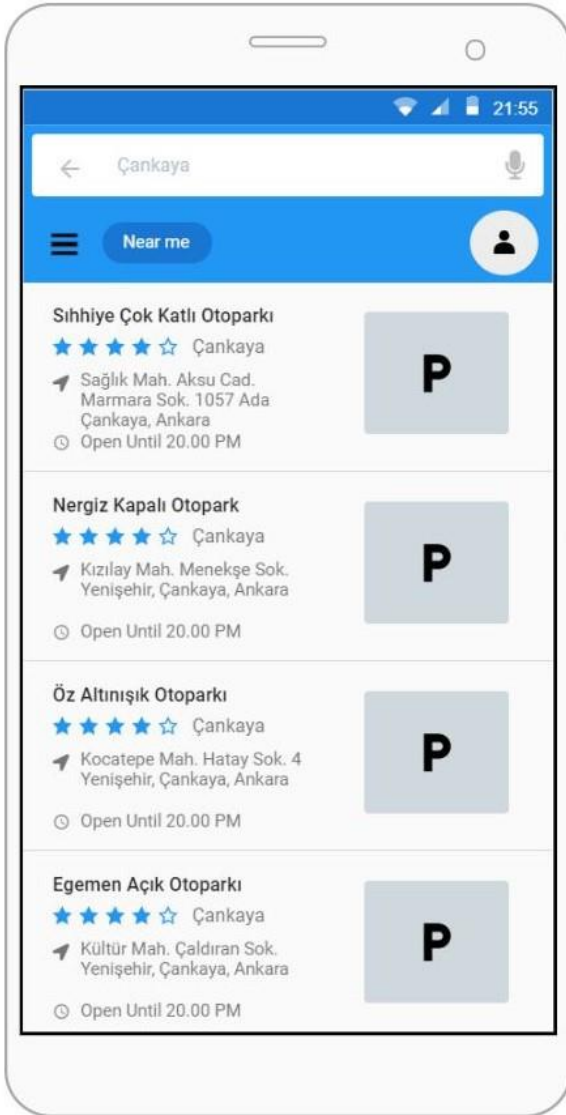
On this screen, the parking lots in the municipality determined by the user are listed according to the star rate. It has a similar structure with the main screen shown in 5.2.4.

## 5.2.9 Car Parking Description
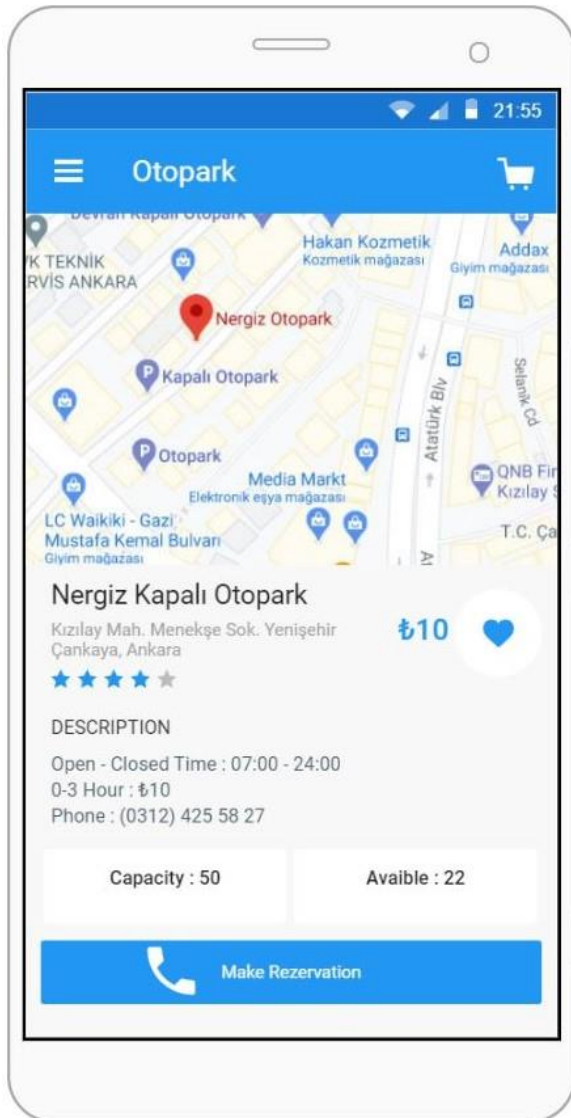


On this screen, the information of the parking lot the user has selected in 5.2.8 section is listed. There is a map view of the park at the top of the screen. In the lower part, there is the fee, opening-closing time and number of the parking lot.

The capacity section shows the general capacity of this car park.

With the Avaible section, the user is informed about how many free places are available during the day.

With the easy search section, the user can make a reservation by directly calling the parking lot. This part will be developed by online payment in other versions of the application.

# 6. Process Design

## 6.1 Use Cases

| Use Case Name: | Sign In |
|---|---|
| Use Case ID: | UC1 |
| Included Use Case(s): | Sign Up |
| Primary Actor(s): | User |
| Description: | The user logs in here to use the application. |
| Precondition: | Must have downloaded the application and must be a registered user. |
| Main Scenario: | 1. The Application should be entered. If not registered user must be registered.<br>2. He must enter his registered phone number.<br>3. He must enter his password. If they forgot it, they should click Forgot Password and get a new password.<br>4. In the Forgot My Password section, he / she should update his / her password with the password renewal e-mail received.<br> 5. Finally, the application is entered by pressing the Sign In button. |

| Use Case Name: | Sign Up |
|---|---|
| Use Case ID: | UC2 |
| Included Use Case(s): | - |
| Primary Actor(s): | User |
| Description: | It is for the new user to complete the membership form and become a member. |
| Precondition: | The user must have downloaded and run the application. |
| Main Scenario: | 1. The user must first enter their full name.<br>2. The user must set himself a username. |

| | |
|---|---|
| | 3. User must enter their email.<br>4. The user must set himself a password and enter it, and re-enter the same password in the control password section.<br>5. Finally, by entering the phone number and clicking the sign up button, the member form is completed.<br>6. Membership is completed with the verification code sent to your phone. |

| | |
|---|---|
| **Use Case Name:** | Check Out the Main Menu. |
| **Use Case ID:** | UC3 |
| **Included Use Case(s):** | - |
| **Primary Actor(s):** | Customer |
| **Description:** | The main menu is the first part that opens when you log in to the application. Popular parking lots are listed here and access to everything that the application provides is provided here. |
| **Precondition:** | It must have installed and run the application and logged in as a member. |
| **Main Scenario:** | 1. The highest rated popular car parks are listed in the main menu. Parking can be selected here.<br>2. In the upper left there are three line icons. With this icon, can switch to the menu section. This is an option.<br>3. There are 5 options in the menu section.<br>4. Looking at the settings in the Settings section.<br>5. The user can access the car parks he added to his favorites from the My Favorite Car Parks section.<br>6. Occasion, discounts or packages offered by the car parks are found in the "Occasion" section.<br>7. In the My Coupons section, the coupons offered by the car parks or the application, if any, are displayed.<br>8. In the History section, the parking lots where the user has booked in the past are listed.<br>9. Profile information can be accessed as an option from the top right of the main menu.<br>10. Profile information can be updated or viewed from the Profile Information section.<br>11. In the Registered Plates section, registered plates can be changed, deleted or a new one can be added.<br>12. There is a search box at the top of the main menu. You can search with this box. |

| Use Case Name: | Search Box |
| --- | --- |
| Use Case ID: | UC4 |
| Included Use Case(s): | - |
| Primary Actor(s): | User |
| Description: | This area is for parking or area search. |
| Precondition: | It must have installed and run the application and logged in as a member. |
| Main Scenario: | 1. Click on the search box in the main menu.<br>2. As soon as the box is clicked, the districts within the province of Ankara are listed in order. If the user wants, they can choose from the districts and proceed or make the search they want.<br>3. According to the search, the parking lots are listed. |

| Use Case Name: | Check out the parking lots |
| --- | --- |
| Use Case ID: | UC5 |
| Included Use Case(s): | - |
| Primary Actor(s): | User |
| Description: | Here, the car parks are presented to the user in order. The user can quickly inspect the parking lots. |
| Precondition: | It must have installed and run the application and logged in as a member. |
| Main Scenario: | 1. Parking lots are shown one under the other.<br>2. Important details (parking lot rating, availability, price, etc.) are in the box of the relevant parking lot.<br>3. Can filter and sort. (Price, location etc.) |

| Use Case Name: | Select Parking |
|---|---|
| Use Case ID: | UC6 |
| Included Use Case(s): | - |
| Primary Actor(s): | User |
| Description: | The user selects one of the car parks and the user can access detailed information of the selected car park. |
| Precondition: | It must have installed and run the application and logged in as a member. |
| Main Scenario: | 1. The user selects one car park among the car parks. <br> 2. You can see the detailed information of the parking lot chosen. These are: the exact location, photos, price information, detailed information of the car park, opportunities if there are opportunities, total capacity and the number of available par areas <br> 3. If he likes the parking lot, he can add it to his favorites and reach the parking lot quickly in the next use. <br> 4. If he has decided on the parking lot, he can make a reservation by calling the parking lot directly from the Search button. |

UML Diagram:
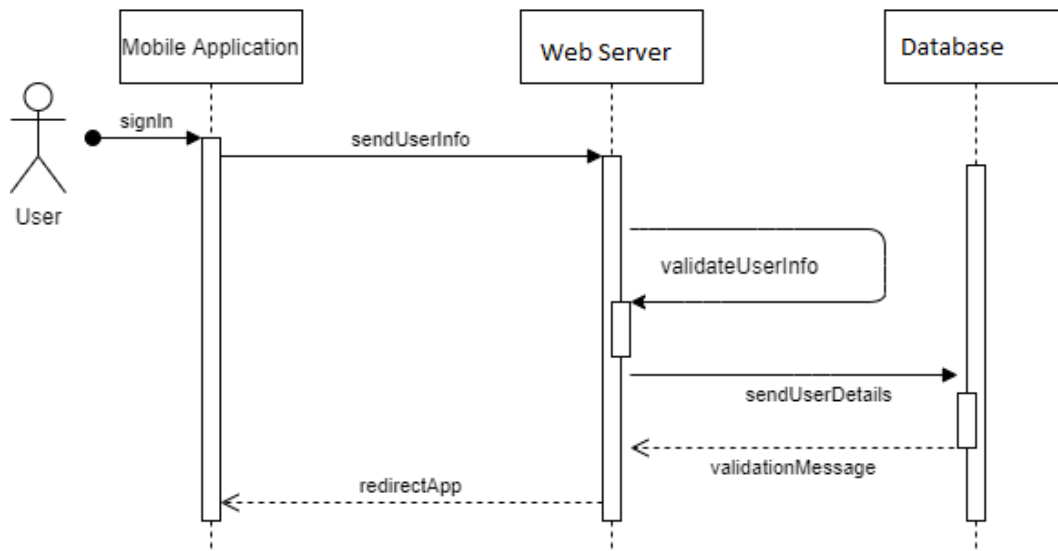
## 6.2 Sequence Diagrams

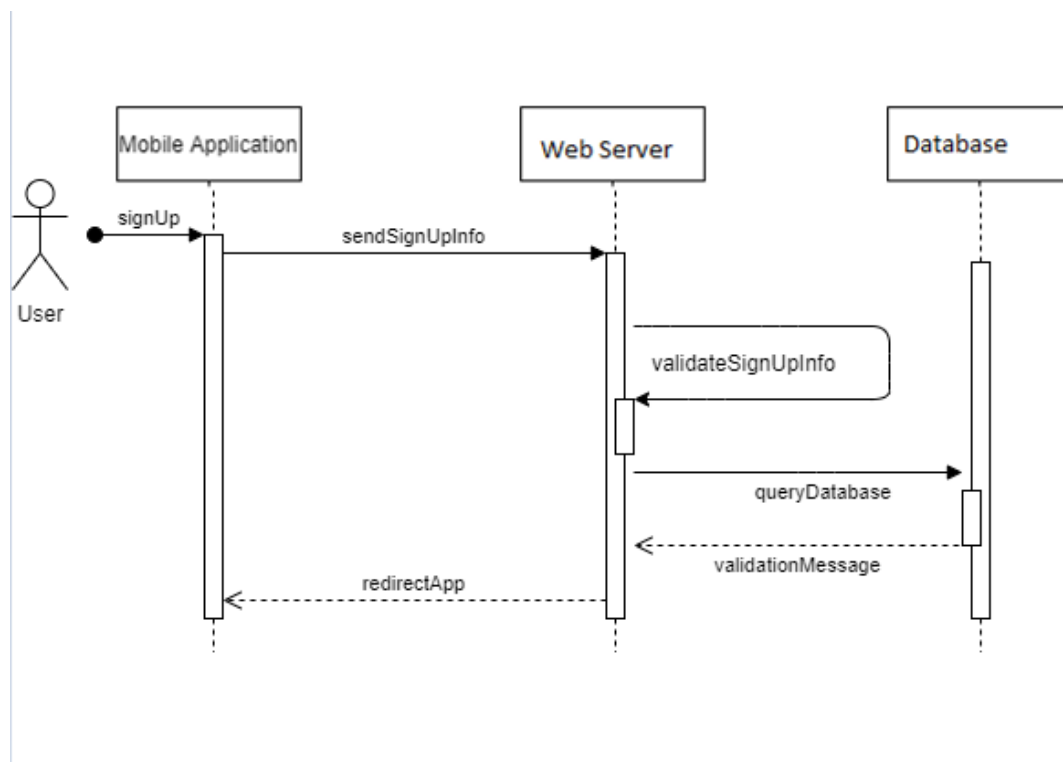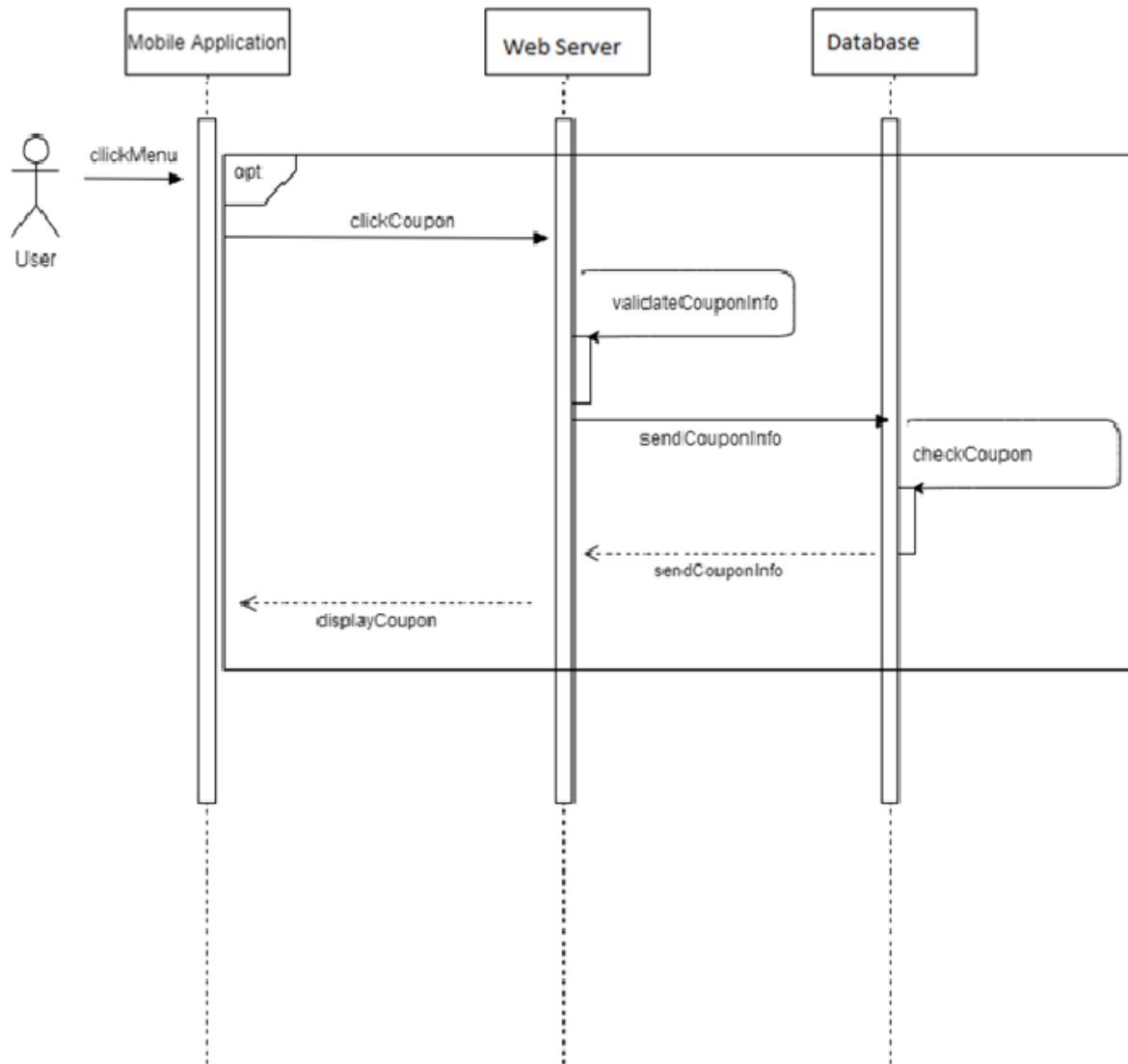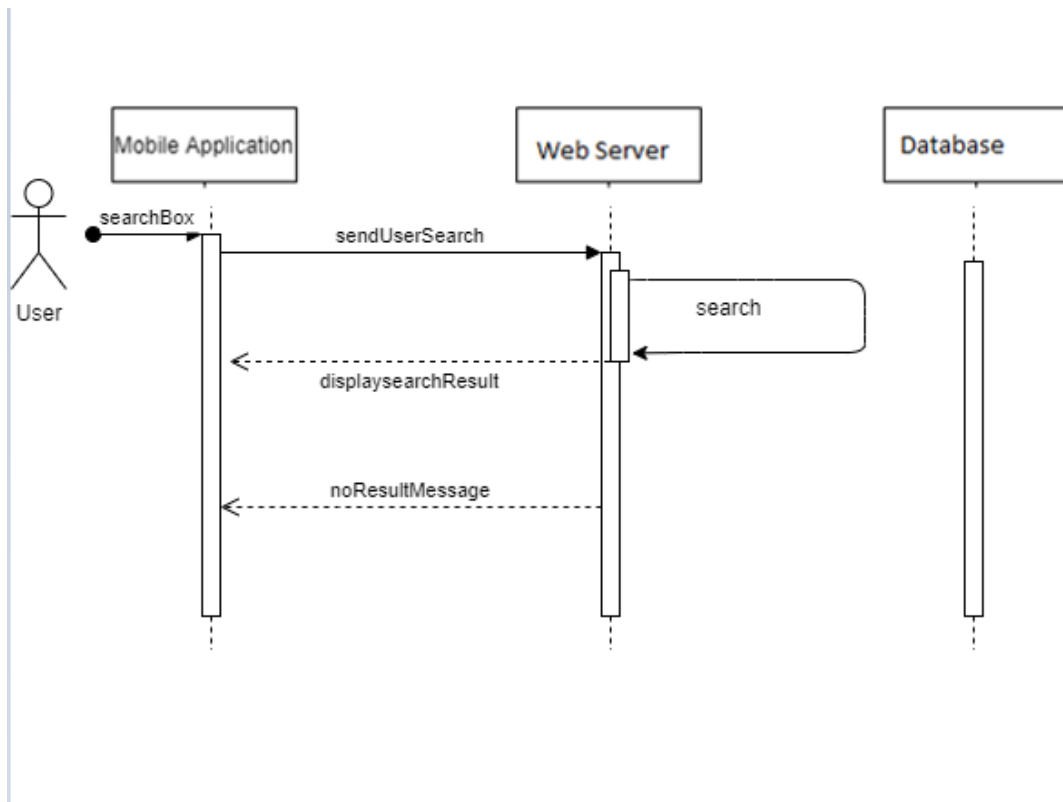Diagram for UC1:



Diagram for UC2:

Diagram for UC3:

Sample Coupon Option:
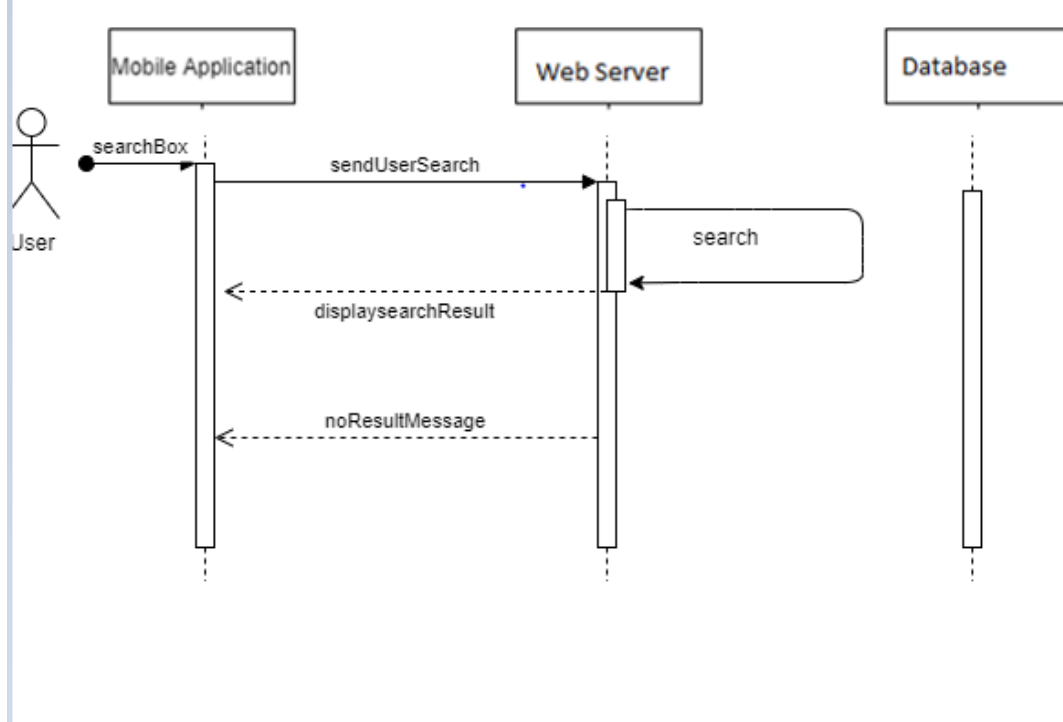
Diagram for UC4:



Diagram for UC5:

Diagram for UC6: