Group No: 10

Requirements Document

E-commerce website for community car-rental service

TraWell

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8. Summary

1. Introduction

With the cities expanding and endless roadlines, transportation is becoming an issue for the people who do not have their own personal transport and in this information age, where anything and everything is facilitated through online means, we plan to build a Online Car Rental Website. Transport facility is a matter of headache for those people who do not have any personal transport in various cities. On occasions like Wedding, Vacation, house shifting, and tour and on many other situations they feel the necessity of a vehicle to sort out the problems problems. So if it is possible to design or develop a web based application for availing transport whenever and wherever possible, then it will be beneficial for both renter and transport provider. Nowadays, by some clicks only, we can get whatever you want at home. We already know about online shopping, e-banking etc. Similarly, The Car Rental System is the online facility to book cars online within a few clicks only. Some people can not afford to have a car, for those people this system becomes very helpful. This system includes various cars, as per the customer order and comfort, it place the order and deliver the car as per the location within the area. For travelling a long distance, booking can be done via internet service only.

1.1 Purpose:

The advancement in Information Technology and internet penetration has greatly enhanced various business processes and communication between companies (services provider) and their customers of which the car rental industry is not left out. This E-Car Rental System is developed to provide the following services

1.1.1 Enhance Business Processes:

To be able to use internet technology to project the rental company to the global world instead of limiting their services to their local domain alone, thus increase their return on investment (ROI).

1.1.2 Online Vehicle Reservation:

A tool through which customers can reserve available cars online prior to their expected pickup date or time.

1.1.3 Customer's registration:

A registration portal to hold customer's details, monitor their transaction and use the same to offer better and improve services to them.

1.2 Problem Statement:

A car rental is a vehicle that can be used temporarily for a fee during a specified period. Getting a rental car helps people get around despite the fact they do not have access to their own personal vehicle or don't own a vehicle at all. The individual who needs a car must contact a rental car company and contract out for a vehicle. This system increases customer retention and simplify vehicle and staff management.

1.3 Product Scope:

This project traverses a lot of areas ranging from business concept to computing field, and required to perform several researches to be able to achieve the project objectives. The area covers include:

- Car rental industry: This includes study on how the car rental business is being done, the process involved and opportunity that exist for improvement.
- General customers will be able to use the system effectively.
- Web-platform means that the system will be available for access 24/7 except when there is a temporary server issue which is expected to be minimal.

1.4 Aims & Objectives:

Specific goals are

- To produce a web-based system that allows customers to register and reserve cars online and for the company to effectively manage their car rental business.
- To ease customer's tasks whenever they need to rent a car.

1.5 Definitions, Acronyms and Abbreviations:

TERM	DEFINITION
User	Someone who interacts with the web application
Lender	Someone who's added cars for other users to rent
Renter	Someone who's looking to rent a car
Request	When a renter wants a specific car, a request is made to the lender. This request may be accepted or denied.
Booking	When a car request is accepted and a deal has been booked, the exchange is referred to as a booking.
Status	For requests, there will be accepted or denied status once the lender interacts with the request depending on their action. For bookings, there will be ongoing or complete status once it is confirmed depending on when the car is finally returned.

2. Description

2.1 Product Perspective:

2.1.1 Existing system function:

A car rental is a vehicle that can be used temporarily for a period of time with a fee. Renting a car assists people to get around even when they do not have access to their own personal

vehicle or don't own a vehicle at all. The individual who want to rent a car must first contact the car rental company for the desired vehicle. This can be done online. At this point, this a person has to supply some information such as; dates of rental, and type of car. After these details are worked out, the individual renting the car must present a valid Identification Card.

Most companies throughout the industry make a profit based on the type of cars that are rented. The rental cars are categorized into economy, compact, compact premium, premium and luxury. And customers are free to choose any car of their choice based on their purse and availability of such cars at the time of reservation.

Car Rental System gives car rental service for both foreign and local customers. This organization carries out its daily work by providing; their service to the customers using a manual system. The organization uses a manual system for reserving, renting, register and to keep record of all the rental activities and customer information. The detailed existing system functions are listed as follows:

- During car reservation the customers reserve a vehicle by making a phone call to the organization; otherwise he/she is expected to go to the organization to make a reservation.
- During renting a car the customer's personal information, payments status and rent agreements are filled in the car rent agreement form in order to hold a legal contract between the customer and organization for renting the vehicle.
- The organization normal work time schedule is from 1:30am – 6:00pm; therefore the organization gives services for ten and half hours a day.
- The organization makes a general report about the rented cars once at the end of the month and generates a report

2.1.2 Product functionality:

Car Rental System provides the features for booking and lending a car online. It includes several functionalities describes as below

2.1.2.1 Car Rental Management:

It provides car reservation facilities online. Customer can visit the website and check for various cars. If they are feasible with requirements, then booking can be done.

2.1.2.2 Car Lending Management

It provides car lending facilities online. Users can visit the website and add their car and with necessary car details. The user can add images and provide additional features about the car. Customers can decide the rental price while adding their car for rental service.

2.2 Benefits of Online Car Rental Services

- This online car rental solution is fully functional and flexible.
- It is very easy to use. This online car rental system helps in back office administration by streamlining and standardizing the procedures.
- It saves a lot of time, money and labor.
- Eco-friendly: The monitoring of the vehicle activity and the overall business becomes easy and includes the least of paper work.
- The application acts as an office that is open 24/7.
- It increases the efficiency of the management at offering quality services to the customers.
- It provides custom features development and support with the application.

2.3 Users and Characteristics:

2.3.1 User:

2.3.1.1 Renter

- To be able to browse and select a car to rent
- To be able to look for cars specific to the user's time and place requirements
- To be able to request a car for rent
- To be able to access expected total payment beforehand
- To be able to access final payment once the deal is completed

2.3.1.2 Lender

- To be able to add a car with all the necessary information
- To get a request for car rental before the booking is confirmed
- To be able to accept or deny the request
- To be able to enter car rental fare for their own cars

2.4 Operating Environment:

2.4.1 Server Side:

Processor: Intel processor

HDD: Minimum 250GB Disk Space

RAM: Minimum 8GB

OS: Windows 8.1, Linux, MAC

Database: MongoDB

Application: Robo3t

2.4.2 Client Side:

Processor: Intel Dual Core

HDD: Minimum 80GB Disk Space

RAM: Minimum 1GB

OS: Windows 7, Linux. Mac

2.5 Design and Implementation Constraints:

- The application will use Reactjs, Nodejs, Expressjs, MongoDB, as main web technologies.
- HTTP and FTP protocols are used as communication protocols. FTP is used to upload the web application in live domain and the client can access it via HTTP protocol.
- Several types of validations make this web application a secured one.
- Since the Car Rental system is a web-based application, internet connection must be established.
- The Car Rental System will be used on PCs and will function via internet or intranet in any web browser.

2.6 User Documentation:

There will be no user manuals, online helps or tutorials as it is made as simple as web beginners can also use it easily with best web GUI functionality

2.7 Assumptions and Dependencies:

2.7.1 Regulatory Policies:

Each center user has an account created and with appropriate authentication. This Website can be accessible to all the users. Each user has to first login itself to present him/her after entry in franchisee. This will be done automatically. No user can share their username and password to each other. User needs to accept the terms and conditions provided on the website before adding a car or before renting a car.

2.7.2 Hardware Limitations:

There is no limitation in the operating system in which the Car Rental System will work. However, the Car Rental System and the database will work on a server that needs to be always online. Users can access the system with any internet browser.

3. Proposed System

3.1 Stakeholder Requirements

3.3.1 User:

3.3.1.1 Renter

- To be able to browse and select a car to rent
- To be able to look for cars specific to the user's time and place requirements
- To be able to request a car for rent
- To be able to access expected total payment beforehand

- To be able to access final payment once the deal is completed

3.3.1.2 Lender

- To be able to add a car with all the necessary information
- To get a request for car rental before the booking is confirmed
- To be able to accept or deny the request
- To be able to enter car rental fare for their own cars

3.2 Business Requirements

3.2.1 Ease of Access(BR1):

a. The system should provide functionality for the customer to easily access and view their account details.

3.2.2 Provide functionality for updation(BR2):

a. Different stakeholders should be allowed to make updations as per their roles.

3.2.3 Integrated System(BR3):

a. Stakeholders and users should be able to access and utilise the functionalities in the system as a whole.

3.2.4 Car Renting System(BR4):

a. Appropriate functionalities associated with renting a car should be provided.

3.2.5 Car Lending System(BR5):

b. Appropriate functionalities associated with lending a car should be provided.

3.3 External Interface Requirements

3.3.1 User Interfaces:

b. All the users will see the same page when they enter this website. This page asks the users a username and a password.
c. After being authenticated by the correct username and password, users will be redirected to their corresponding dashboard page where they can do various activities.
d. The user interface will be simple and consistent, using terminology commonly understood by intended users of the system. The system will have simple interface, consistence with standard interface, to eliminate need for user training of infrequent users

3.3.2 Hardware Interfaces:

a. No extra hardware interfaces are needed.
b. The system will use the standard hardware and data communication resources.
c. This includes, but not limited to, general network connection at the server/hosting site, network server and network management tools.

3.3.3 Application Interfaces:

a. OS: Windows 7, Linux, MAC
b. Web Browser: The system is a web based application; clients need a modern web browser such as Mozilla Firefox, Internet Explorer, Opera, and Chrome. The computer must have an Internet connection in order to be able to access the system

3.3.4 Communications Interfaces:

a. This system uses communication resources which includes but not limited to, HTTP protocol for communication with the web browser and web server and TCP/IP network protocol with HTTP protocol.
b. This application will communicate with the database that holds all the booking information. Users can contact the server side through HTTP protocol by means of a function that is called HTTP Service. This function allows the application to use the data retrieved by the server to fulfill the request fired by the user.

3.4 Functional Requirements

3.4.1 User Accounts (FS1)

e. The system should allow the user to create a new user account. (FS1.1)
f. The system should perform OTP verification before registering a new account. (FS1.2)
g. The system should allow users to login to the system using their username and password. (FS1.3)
h. The system should allow the user to change account password. (FS1.4)
i. The system should not allow the user to continue with a username which is not unique. In that case the system needs to ask the user to enter a new username which is unique. (FS1.5)
j. The system should allow the user to set a password only if it fits the minimum strength criteria. (FS1.6)
k. The system should allow the user to log out. (FS1.7)
l. The system should allow the user to edit profile information. (FS1.8)

3.4.2 Data Accessibility (FS2)

a. Every user should only be able to change their own data. (FS2.1)
b. Every user should be able to access different car details. (FS2.2)
c. A lender should be able to get the renter's name and contact details with the car request. (FS2.3)
d. A renter should be able to get the lender's name and contact details along with the car. (FS2.4)

3.4.3 Car Renting (FS3)

a. The system should first ask the user to input the time period and location requirements for the potential car rental.(FS3.1)
b. The user should be allowed to browse through all the cars meeting the requirements.(FS3.2)
c. The user should be able to further filter the results. The filters should include features like Car type, Price Range, City, Fuel Type, Company.(FS3.3)
d. The user should be provided with appropriate information on every car. (FS3.4)
e. The system should provide the option to "request the car" on every car available.(FS3.5)
f. On selection of a car for renting, the required time period and dates of availability will be cross-verified. If the car is unavailable on the given date, an appropriate message should be displayed to the user.(FS3.6)
g. After the booking is confirmed, the expected car rental fees should be provided on display, inclusive of all the secondary payments like taxes and security fee.(FS3.7)

h. After the deal is completed and the car is returned, total payment details, including late penalty if any, should be provided to the renter.(FS3.8)
i. The system should preface the car rental deal with all the necessary legal warnings and not allow the user to proceed with making the request without accepting the terms. (FS3.9)

3.4.4 Adding a Car (FS4)

a. The system should allow users to register new cars. (FS4.1)
b. The system must ask the user to input all necessary information regarding the car being added to the system. The information should include features like Company name, Model name, Car category, Number of seats, Car Registration number, Car colour, Fuel Type, Engine Type, Car images and Additional Features if any. (FS4.2)
c. The system should ask the user to enter the rental price of their car. (FS4.3)
d. The system should present information on security and protection, and request the user to accept or decline regulation terms while adding their car. (FS4.4)
e. The system should allow the user to view all their added cars. (FS4.5)

3.4.5 Car Requests(FS5)

a. The car rental deal should only be finalised after the lender accepts the car rental request. (FS5.1)
b. The lender should be able to access the car rental requests they receive with ease. (FS5.2)
c. The lender should be allowed to either “Accept” or “Deny” the rental request. (FS5.3)
d. If the lender accepts the request, the booking will be considered confirmed the car will be lended/rented for corresponding users. (FS5.4)
e. If the request is denied, the renter should be updated of the same as well. (FS5.5)
f. If the request is accepted, other requests of the same car are automatically denied. (FS5.6)

3.4.6 Car Records(FS6)

a. The system must be able to display a booking summary for successfully completed bookings.(FS6.1)
b. These bookings should be bifurcated into Rented Cars and Lended Cars for the respective users.(FS6.2)
c. The booking summary should consist of the payment breakdown and the booking status.(FS6.3)
d. The car records must be actively updated to ensure transparency.(FS6.4)
e. The car records must be accessible to user on their profile.(FS6.5)

3.4.7 System Security (FS7)

a. Public has access to only car details via the website. (FS7.1)
b. Profile editing requires a password-protected user account with manually-assigned rights. (FS7.2)
c. Only logged-in users can add a car to the system. (FS7.3)
d. Only logged-in users can make a car rental request. (FS7.4)
e. Car rental requests have to be accepted by the lender before it's confirmed. (FS7.5)
f. Car return status has to be updated and confirmed by renter and leader respectively before the deal is deemed completed. (FS7.6)
g. Both lenders and renters have access to each other's contact details in case of a security hazard. (FS7.7)
h. Renter has to agree to the legal terms and conditions concerning car's protection before making a deal. (FS7.8)

3.5 Non-Functional Requirements

3.5.1 Performance

a. The system response time for every instruction conducted by the user must not exceed more than a minimum of 10 seconds.
b. The system should have a high performance rate when executing user's input and should be able to provide response within a short time span usually 40 second for highly complicated tasks and 20 to 10 seconds for less complicated tasks.
c. The site should load in 3 seconds when the number of simultaneous users are > 10000(example)

3.5.2 Recoverability

a. The database must run a full backup once a week with incremental backups daily,
b. A disaster recovery test will be scheduled and executed annually to ensure recovery from primary site failure is achievable, and the steps to perform this process are well documented and regularly revised

3.5.3 Availability

a. The system should always be available for access at 24 hours, 7 days a week.
b. Also in the occurrence of any major system malfunctioning, the system should be available in 1 to 2 working days, so that the business process is not severely affected.

3.5.4 Error Handling

a. Error should be considerably minimized and an appropriate error message that guides the user to recover from an error should be provided.
b. Validation of user's input is highly essential. Also the standard time taken to recover from an error should be 15 to 20 seconds.

3.5.5 Quality

a. The system provides a help and support menu in all interfaces for the user to interact with the system. The user can use the system by reading help and support.
b. Maintain a user friendly environment that is visually appealing
c. Easy to see and use navigation
d. Maintain readable content
e. Searching cars should be accessible to people who are and are not logged in

3.5.6 Security

a. The system provides username and password to prevent the system from unauthorized access
b. The system outlines basic terms and conditions for user to abide with before making a deal.

3.5.7 Scalability

a. For now, the website is limited to one city but we may expand it to multiple countries.
b. We may add new features later like a provision for renter and borrower to chat through our platform.

3.5.8 Data Integrity

a. Data of vehicles which were used for renting will be stored in a database along with the information of their owner.
b. Once the user inputs his personal information and other details for renting a car, he/she should not need to re-enter the details for renting another car.
c. Once a car request from one renter is accepted, the other car requests are automatically declined and updated in the database as well as the GUI.

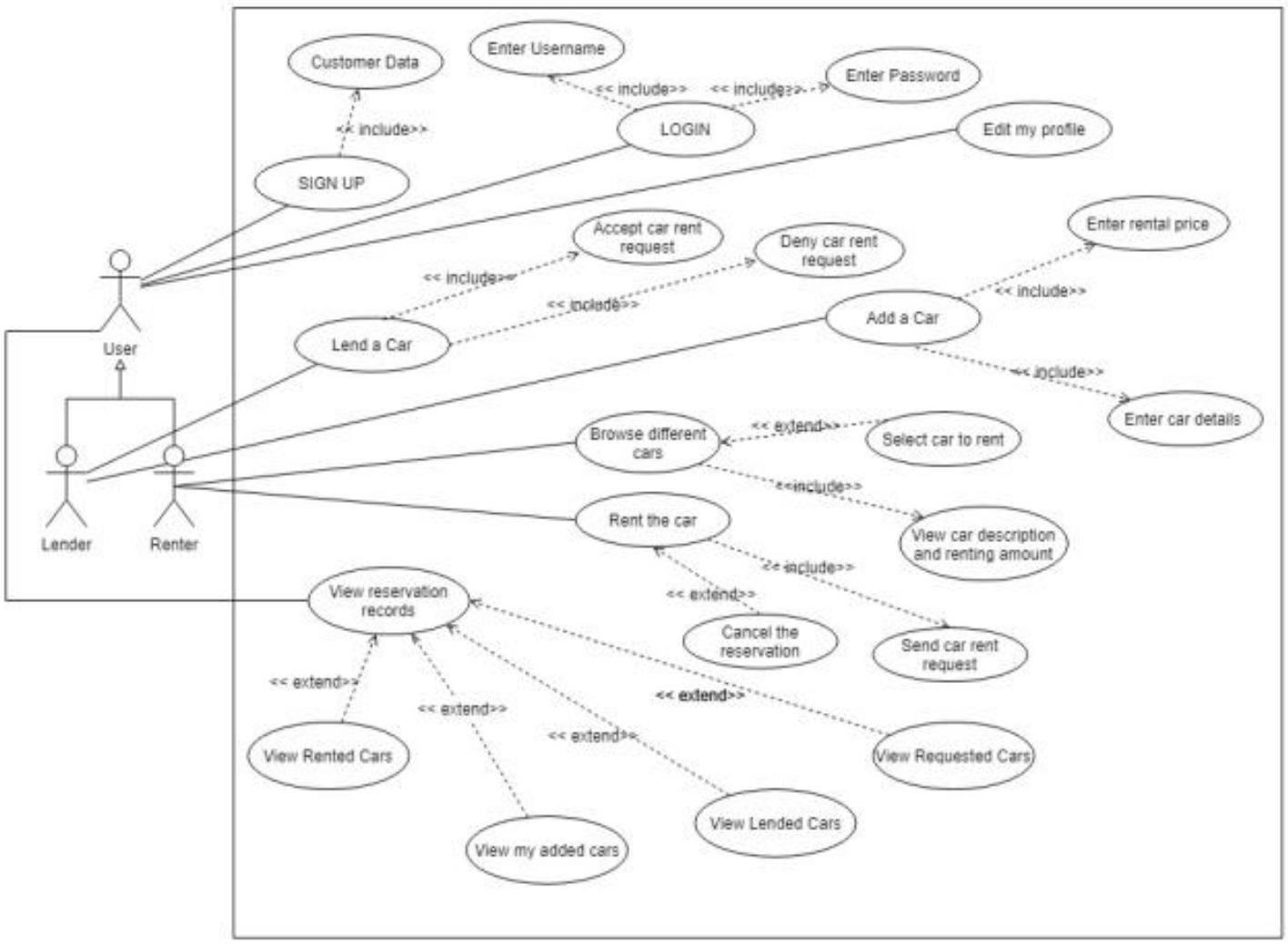
3.5.9 Usability

a. The error rate of users submitting their personal details at the checkout page mustn't exceed 10 percent.
b. The user should be able to learn and understand the interface in their first glance
c. The website should be accessible for all age groups.

3.5.10 Compatibility

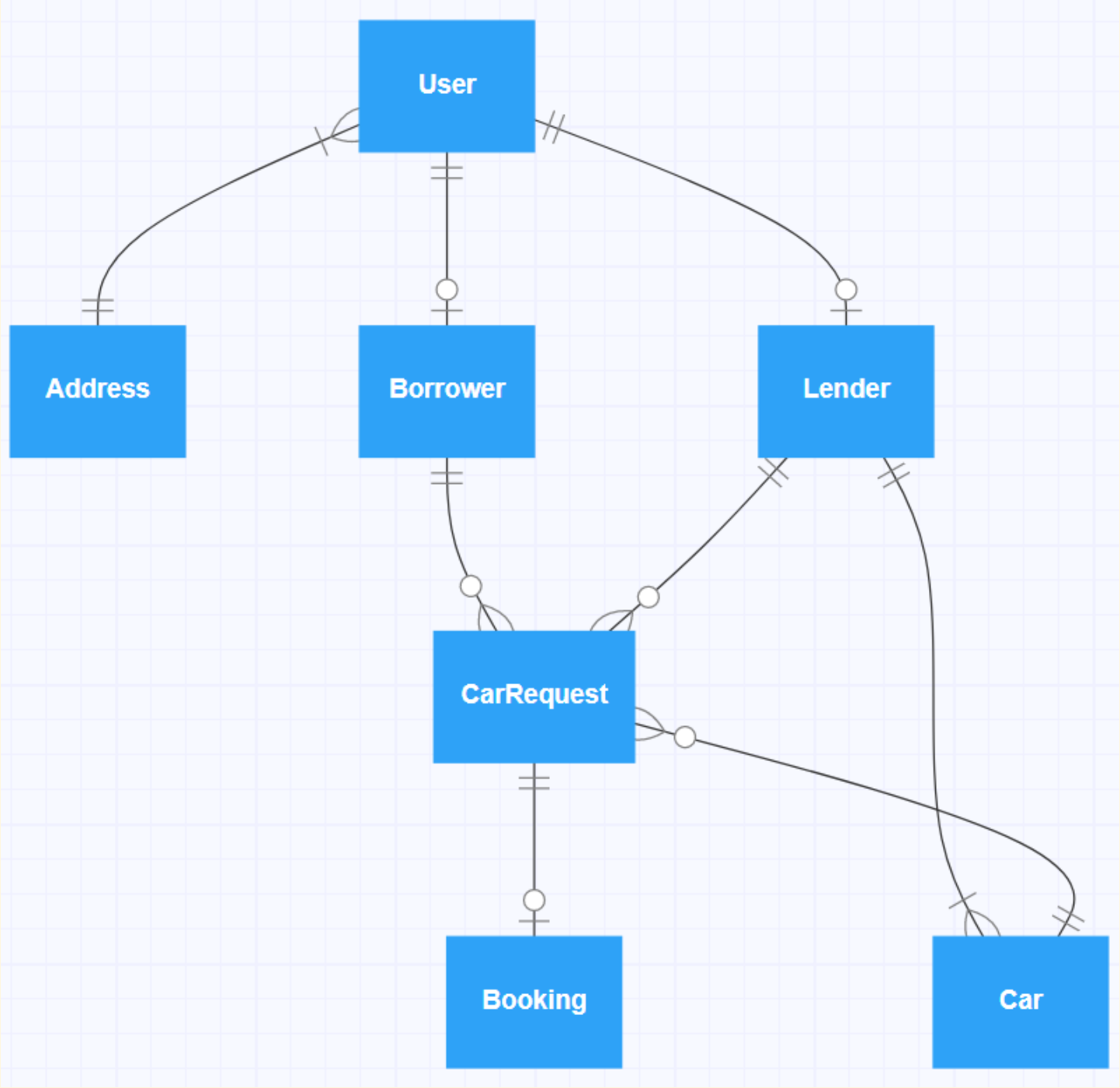
a. Website is compatible with most of the desktop devices

4 Use Case Diagram

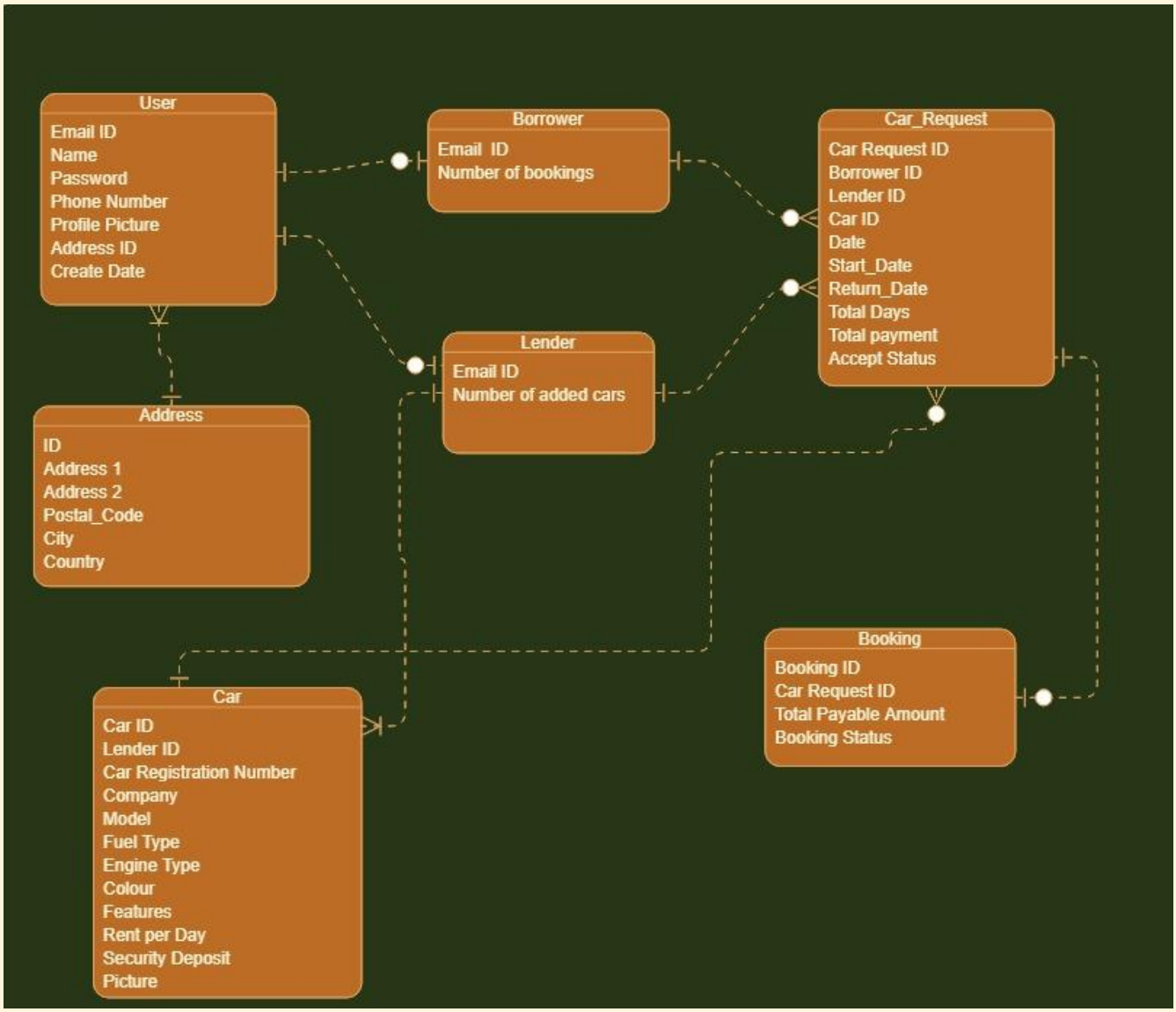


5 ER Diagram

5.1 Conceptual Data Model

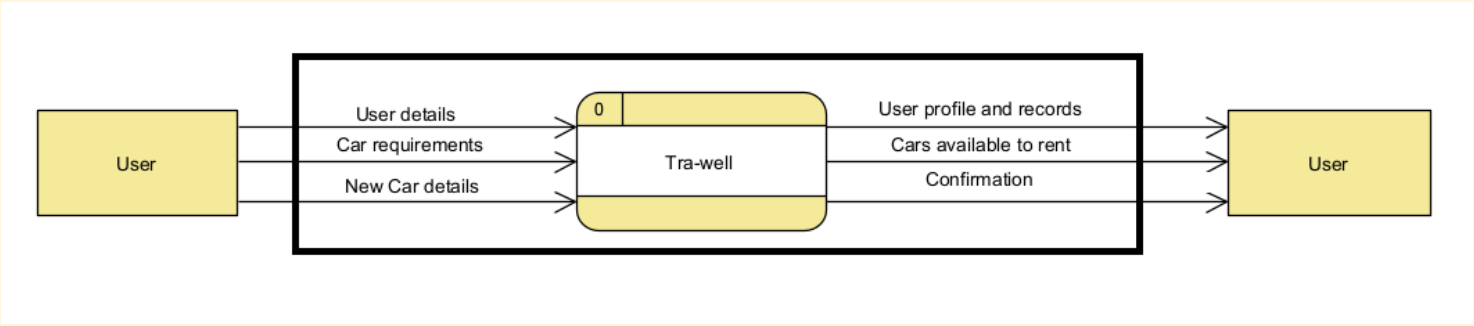


5.2 Logical Data Model

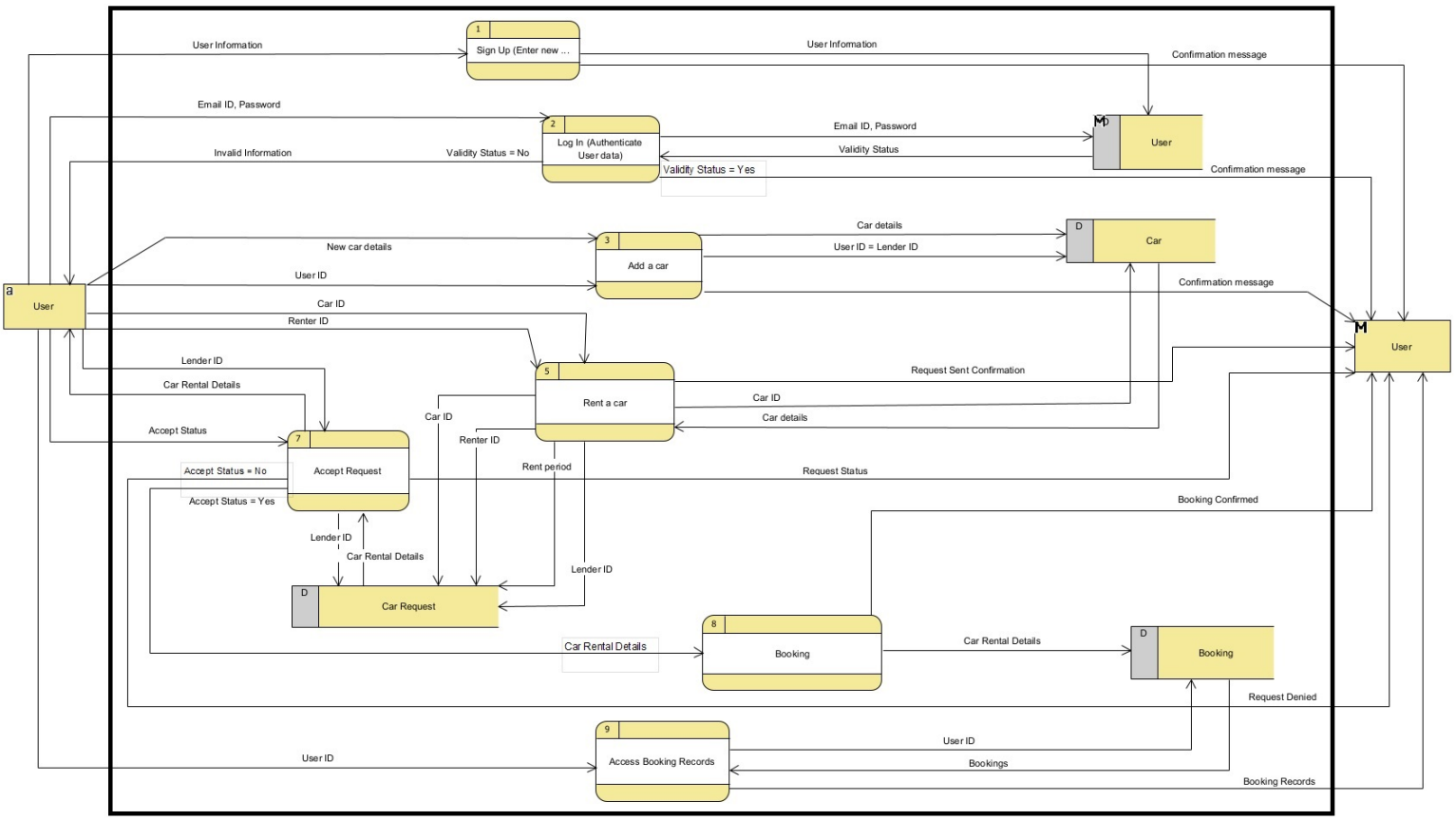


6 Data Flow Diagram

6.1 Level 0



6.2 Level 1


1
Sign Up (Enter new ...
User Information
User Information
Confirmation message
Email ID, Password
2
Log In (Authenticate User data)
Email ID, Password
Validity Status
User
Invalid Information
Validity Status = No
Validity Status = Yes
Confirmation message
Car details
User ID = Lender ID
D
Car
New car details
3
Add a car
User ID
Confirmation message
a
User
Car ID
Renter ID
User
Lender ID
Car Rental Details
5
Rent a car
Request Sent Confirmation
Car ID
Car details
Car ID
Accept Status
7
Accept Request
Renter ID
Rent period
Request Status
Accept Status = No
Accept Status = Yes
Booking Confirmed
Lender ID
Car Rental Details
Lender ID
D
Car Request
8
Booking
Car Rental Details
D
Booking
Car Rental Details
Request Denied
9
Access Booking Records
User ID
User ID
Bookings
Booking Records

6.3 Level 2

6.3.1 DFD Level 2: Sign Up

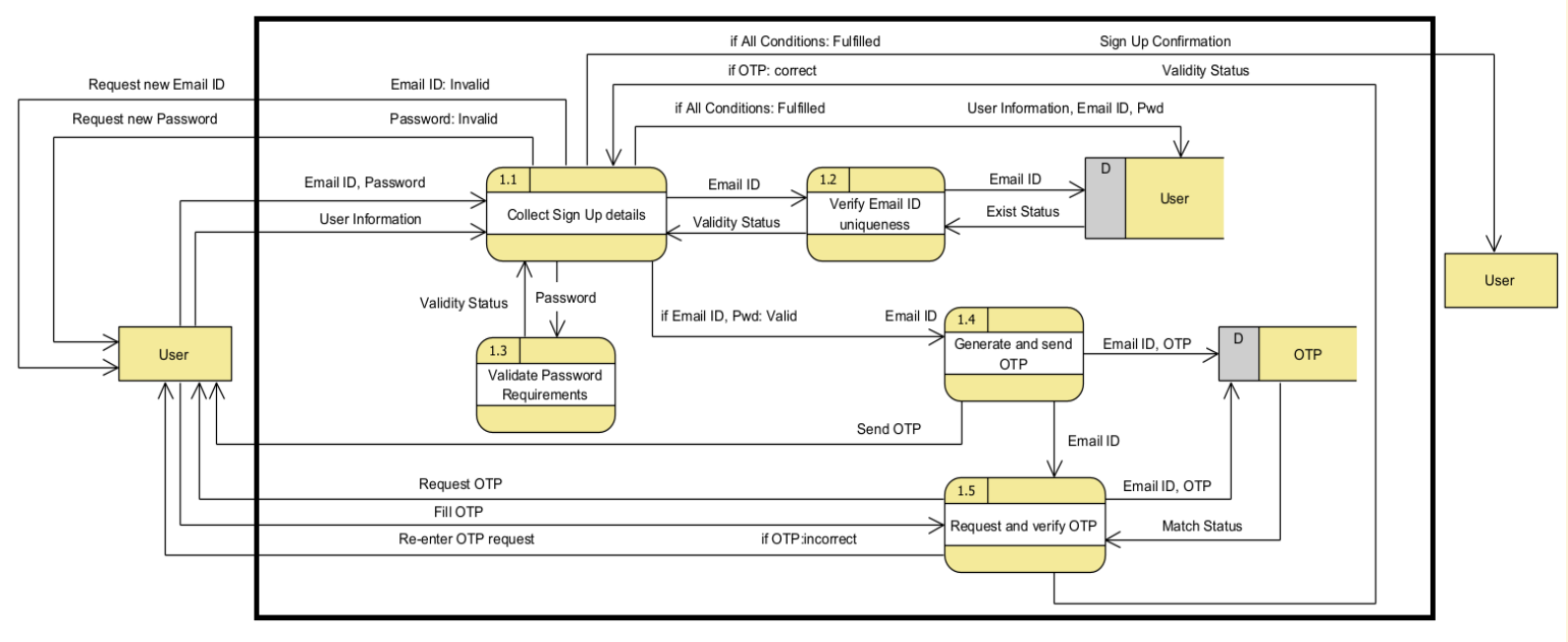


Fig: DFD Level 2: Sign Up

6.3.2 DFD Level 2: Add a Car

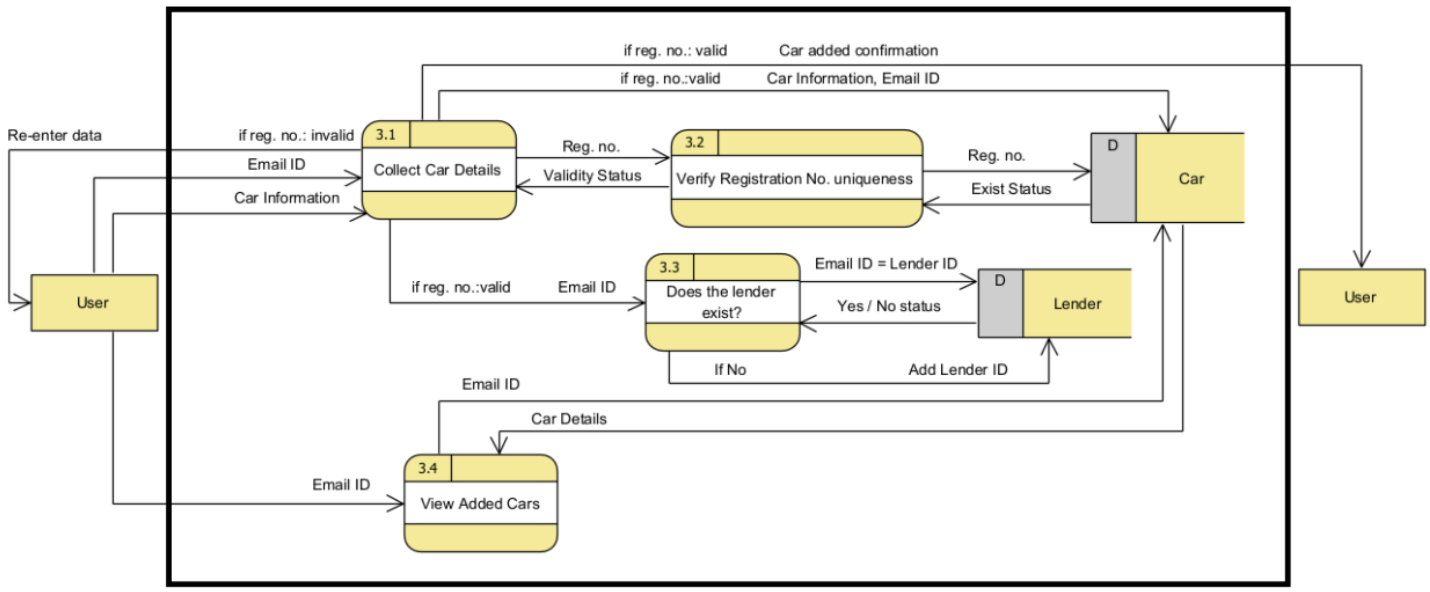


Fig: DFD Level 2: Add a Car

6.3.3 DFD Level 2: Rent a Car

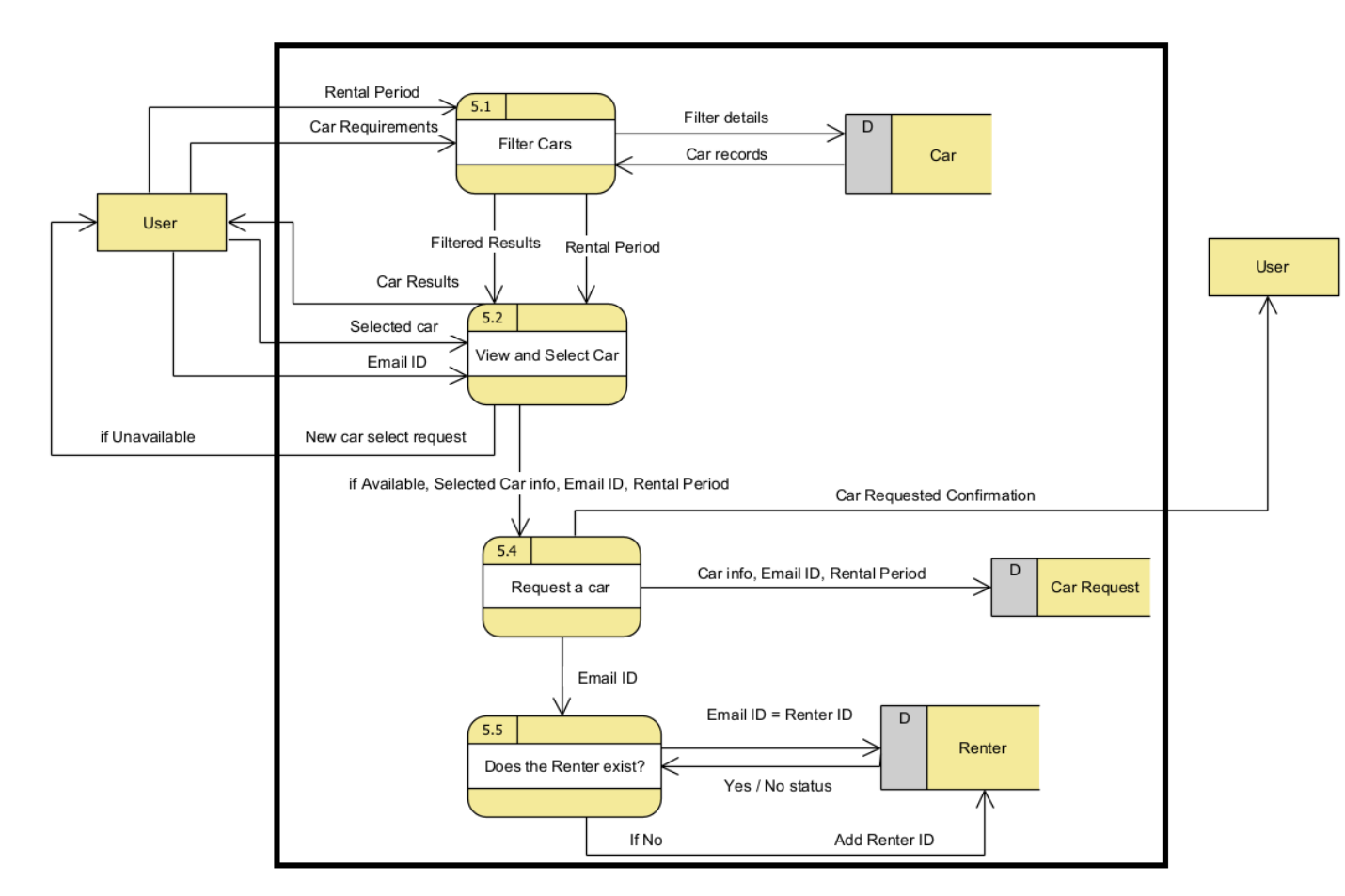


Fig: DFD Level 2: Rent a Car

6.3.4 DFD Level 2: Access Booking Records

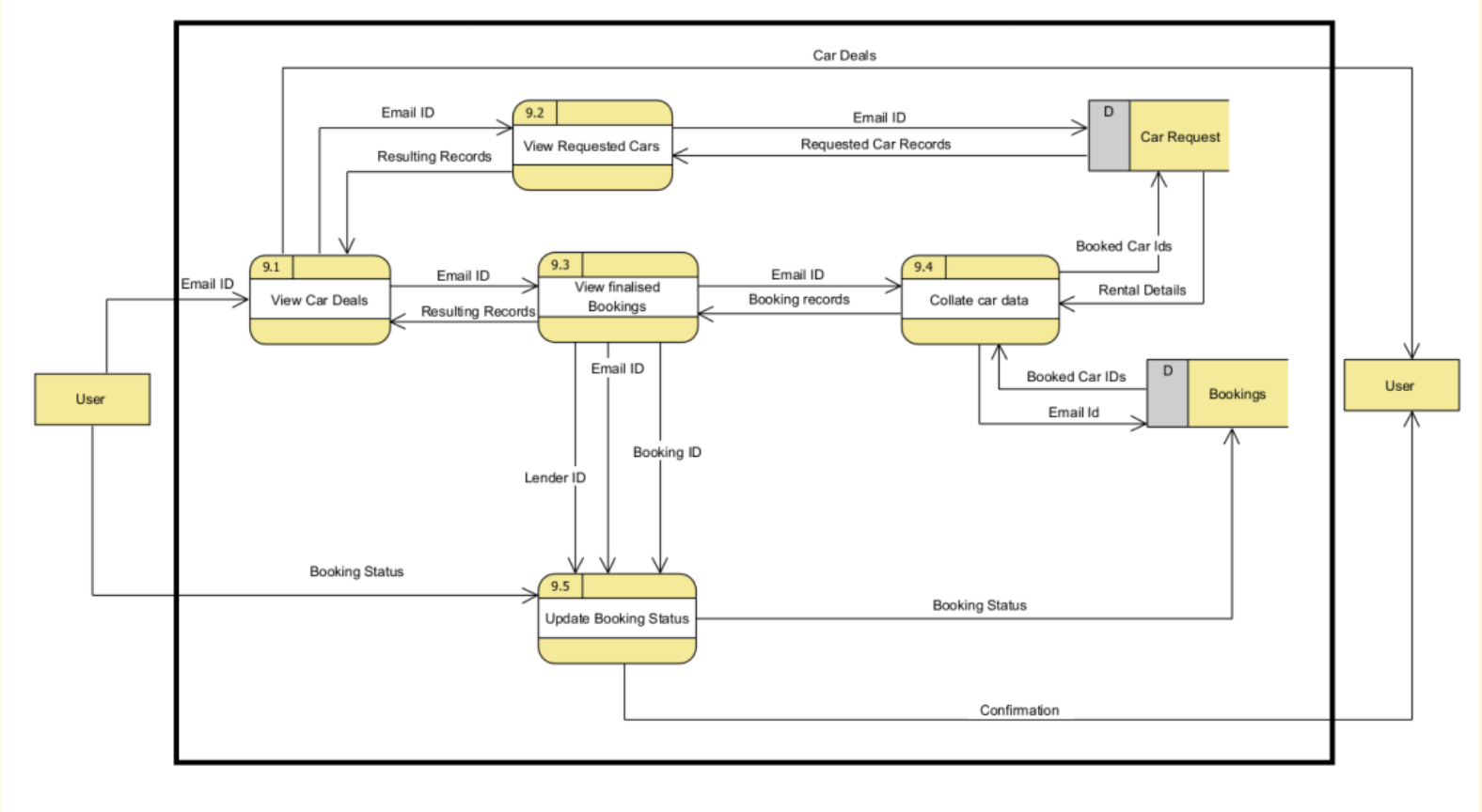
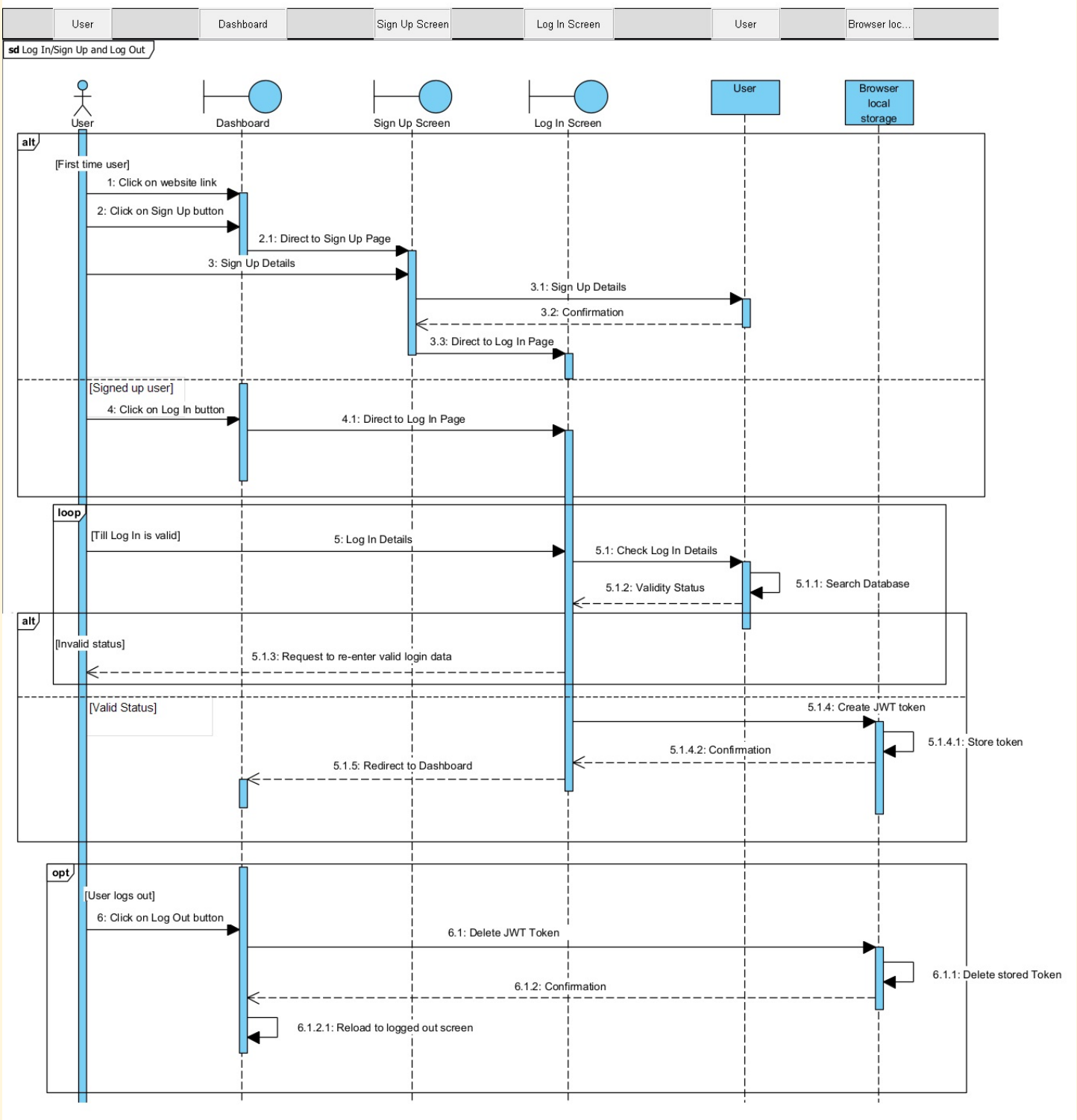


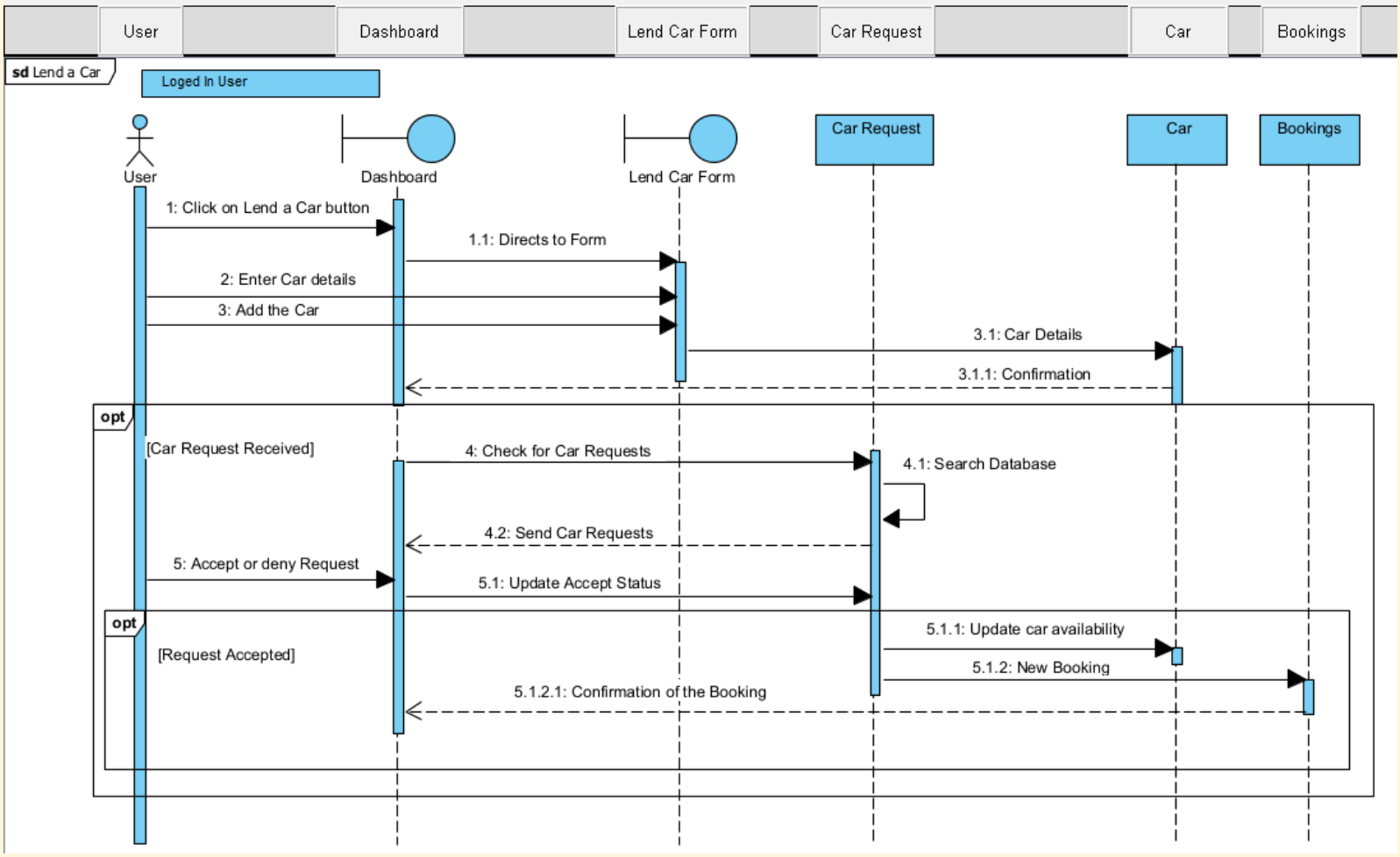
Fig: DFD Level 2: Access Booking Records

7 Sequence Diagram

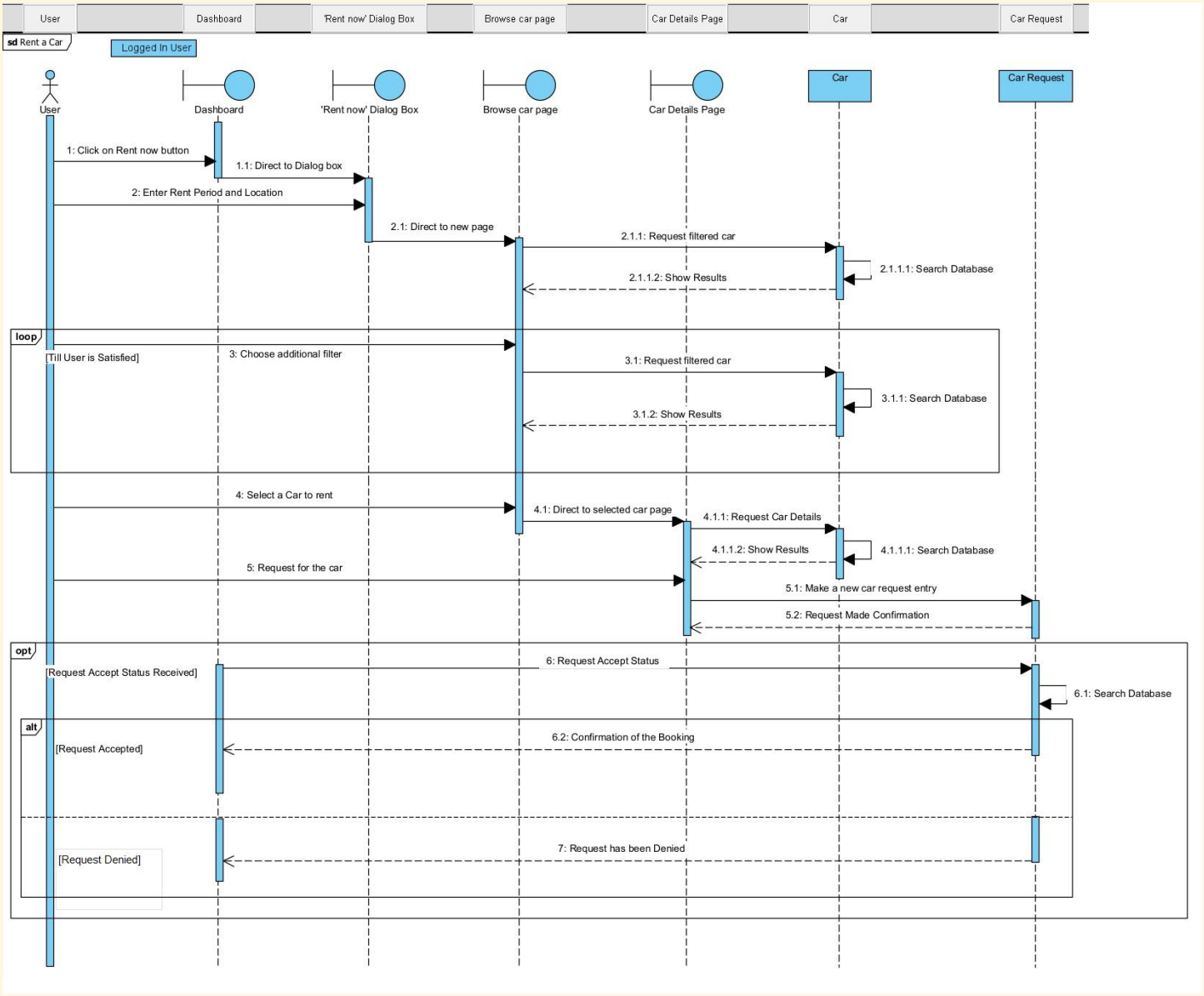
7.1 Log In/Sign Up/Log Out



7.2 Lend a Car


User
Dashboard
Lend Car Form
Car Request
Car
Bookings
sd Lend a Car
Loged In User
1: Click on Lend a Car button
1.1: Directs to Form
2: Enter Car details
3: Add the Car
3.1: Car Details
3.1.1: Confirmation
opt
[Car Request Received]
4: Check for Car Requests
4.1: Search Database
4.2: Send Car Requests
5: Accept or deny Request
5.1: Update Accept Status
opt
[Request Accepted]
5.1.1: Update car availability
5.1.2: New Booking
5.1.2.1: Confirmation of the Booking

7.3 Rent a Car


User
Dashboard
'Rent now' Dialog Box
Browse car page
Car Details Page
Car
Car Request
sd Rent a Car
Logged In User
1: Click on Rent now button
1.1: Direct to Dialog box
2: Enter Rent Period and Location
2.1: Direct to new page
2.1.1: Request filtered car
2.1.1.1: Search Database
2.1.1.2: Show Results
loop
[Till User is Satisfied]
3: Choose additional filter
3.1: Request filtered car
3.1.1: Search Database
3.1.2: Show Results
4: Select a Car to rent
4.1: Direct to selected car page
4.1.1: Request Car Details
4.1.1.2: Show Results
4.1.1.1: Search Database
5: Request for the car
5.1: Make a new car request entry
5.2: Request Made Confirmation
opt
[Request Accept Status Received]
6: Request Accept Status
6.1: Search Database
alt
[Request Accepted]
6.2: Confirmation of the Booking
[Request Denied]
7: Request has been Denied

8. Summary

The SRS provides overall description and an overview of the system functionality and system interaction with other systems. It also describes the probable user interfaces for the better understanding of the appearance of the system to the end users and stakeholders. It also provides the requirements specification in detailed terms and a description of the different system interfaces. Different specification techniques are used in order to specify the requirements more precisely for different audiences. It also depicts the system with user case scenario - use case diagrams, shows how data in the system will flow with - data flow diagram, changing of states due to action of events - using state diagram, relationship among entities of the system for database - Entity Relationship diagram. The SRS document helps the developer to gain better understanding of the system and a strong reference point for the developing and implementation stage of the project.