Basic Software Requirements Specification

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Introduction and Overview

This document presents the breakdown of a car rental system. It is intended to streamline the process of renting a car from a multi-location car rental company by making it both mobile and quick to use. While the intended users are renters, employees, general managers and regional managers will be able to access varying levels of information, both about the available cars and the renters.

This document is organized into three main sections, with the last two sections being split into two subsections each. The first section is the User Requirements, which provide a more detailed breakdown of the intended purpose of the system and what the uses of it are. The next main section is the System Requirements, which have a Functional Requirements and a Non-functional Requirements section.

The Functional Requirements subsection shows how each type of user is intended to interact with the system using case diagrams with a breakdown of the paths. The Non-functional Requirements subsection focuses on the operation of the system.

The last main section is the Additional section, which contains the Possible Risks and Future Improvements subsections. The Possible Risks subsection details some parts of the system that may be vulnerable and some ideas on how to cover for them. The Future Improvements subsection includes some possible features that can be added after the main implementation is completed.

User Requirements

As the system is meant to make the car renting process quicker and more streamlined, it is required to be able to be accessed anywhere. Therefore, it would be accessed from both a website and an app. The website will have a fully functional mobile version, for renters without access to a desktop and that have not downloaded the app.

Information about the locations, available cars, and basic user and employee information will be kept on a secured server, with the more private information, such as card details, emails and electronic copies of rental agreements, stored on a separate, more secure server to prevent data breaches.

All car data, such as color, make, model and maintenance history, will be linked to either a specific ID tag or the license plate number. This is so that the cars may be quickly transferred between locations without deleting and re-inputting the information. Locations will have a set number of available slots for cars, with a smaller overflow allowance for cars returned to that specific location that shouldn't have been.

Renters can use a one-time guest account with only their name and contact details, or make a permanent account. Permanent accounts would allow them to save searches and make it so that they would only have to sign the rental agreement at location on pickup without inputting payment details repeatedly.

Permanent accounts can be signed up for on any platform. They will require name, email, contact information, and payment information before sending a confirmation email. After signing in, renters can search by location, either with location services or manual input, or by a specific car type.

All employees will be able to use their employee ID and password to sign into the system. They will be able to access renter profiles to look for any notes or citations and warnings along with the rental history. After performing a check on returned cars, they will be able to mark cars that may need maintenance.

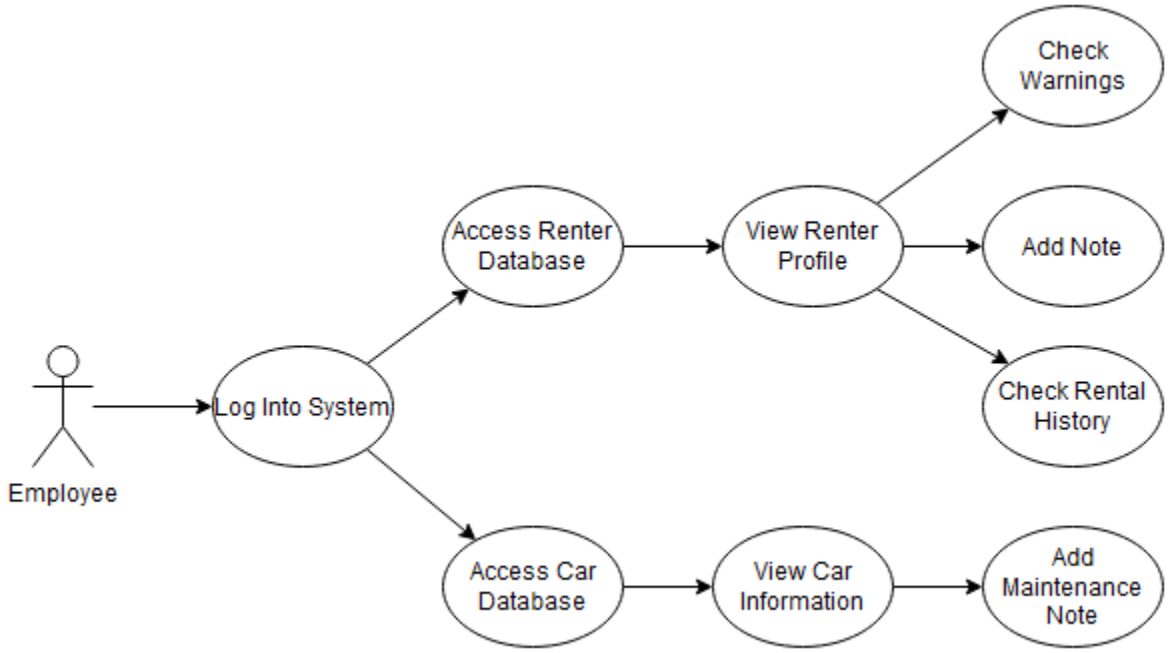
Managers will have the expanded access of being able to add or remove citations and warnings, approve or dismiss maintenance requests and transfer cars between locations. Cars transferred in this way are not rented cars, but returning cars to specific locations if that is where they are supposed to be.

Regional managers will be able to deactivate renters' accounts when the rental agreement is broken and/or too many citations or warnings are added to an account. They will also be able to remove and add cars from the system, such as when one is destroyed or acquired by the company, and edit specific location details, such as available slots.

System Requirements

Functional Requirements

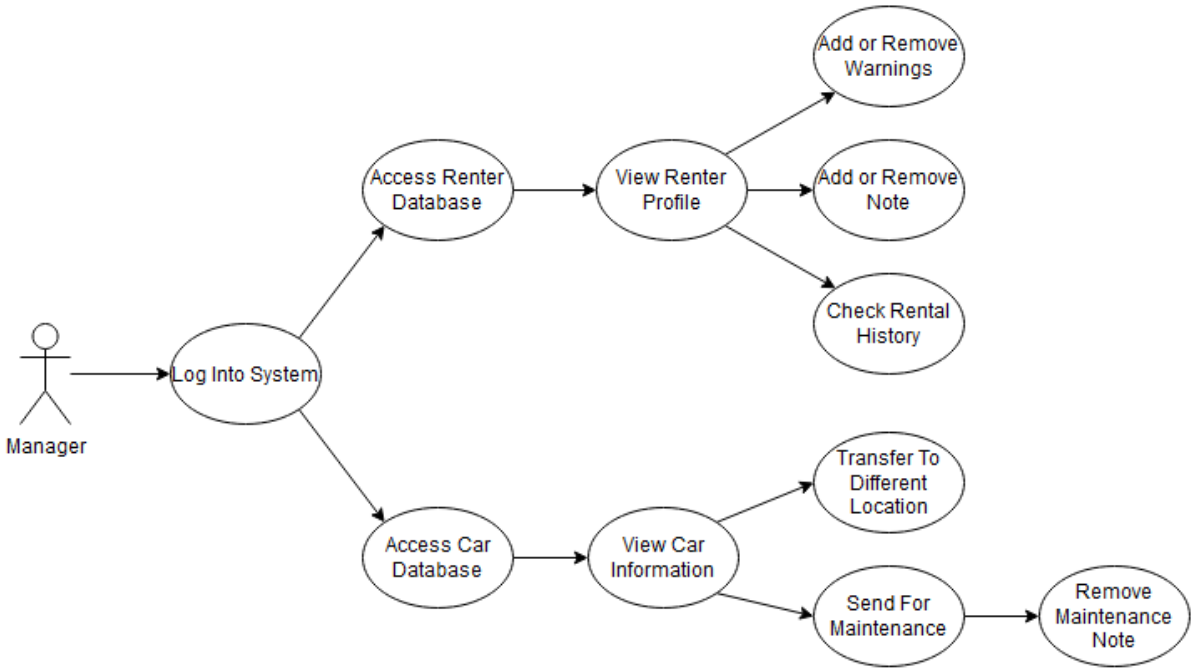
Employees will have limited access to two databases, the Renter database and the Car database. They will not be able to edit either of these databases, only look at select information and add notes to the selected renter profile or car.



In this diagram, the employee logs into the system and can access the renter or the car database. If they access the car database, they can select the specific car and view its information. If required, they can also add a maintenance note.

If the employee accesses the renter database, they can view select renter profiles. From the profile, they can check if there are any warnings attached to the renter, or they can check the rental history. If they feel the need to, they can add a note to the profile, such as when they notice a pattern of cars being returned with damages or if they feel the renter has expressed issues.

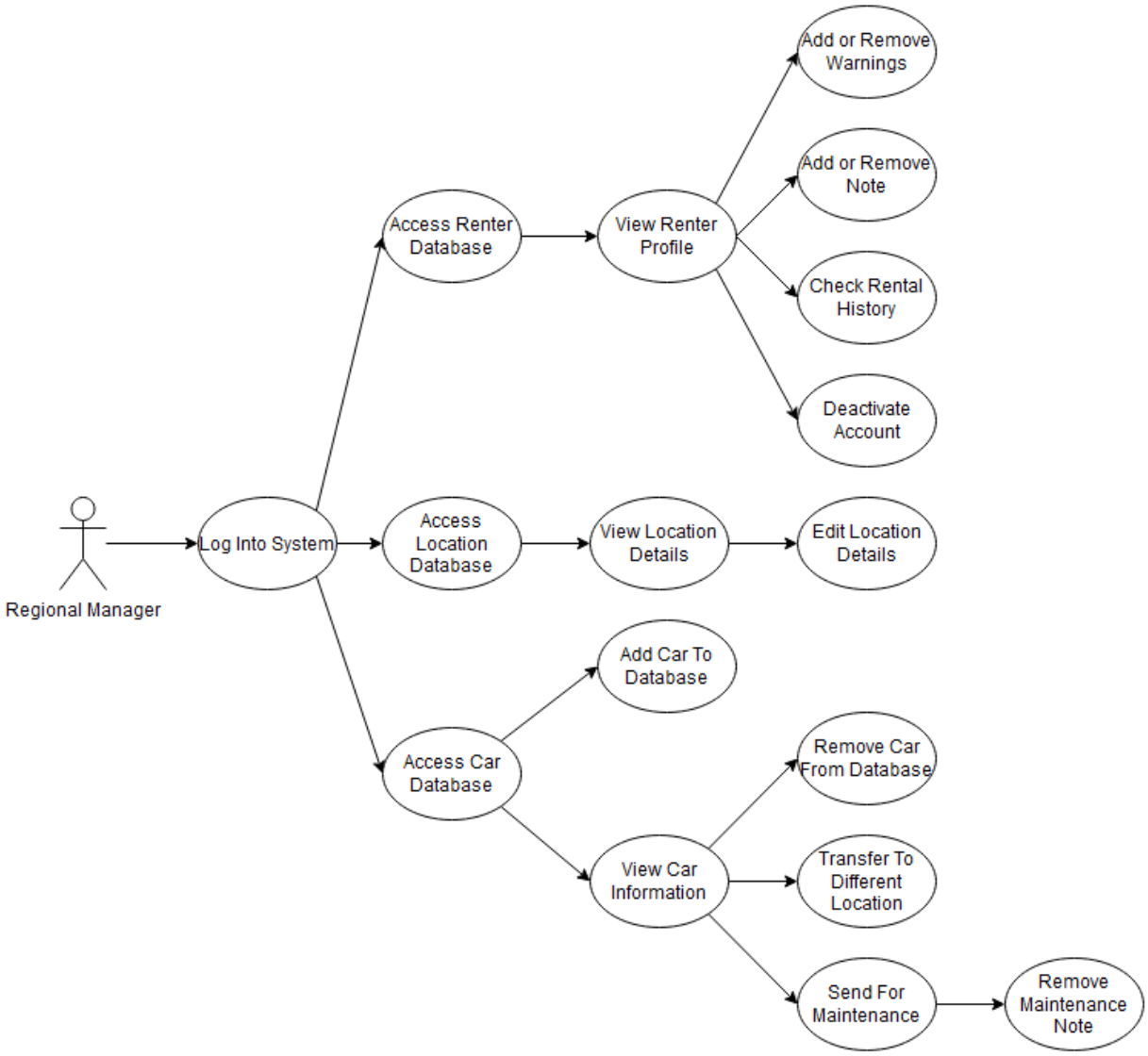
Managers will, on top of the normal employee access, will also be able add and remove warnings to renter profiles as required, send cars for maintenance, and transfer cars between locations.



In this diagram, the manager logs into the system and chooses to access either the renter database or the car database. Accessing the car database, they select a car and view the information. From there, they can either transfer the car to a different location or send it in for maintenance and remove maintenance notes.

If they choose to access the renter database, they can view a renter's profile. Managers can check the rental history of the renter as well as the notes added by other employees. They can add or remove warnings as required based on observed patterns and the notes. If they feel that a note is no longer required, they can remove it as well.

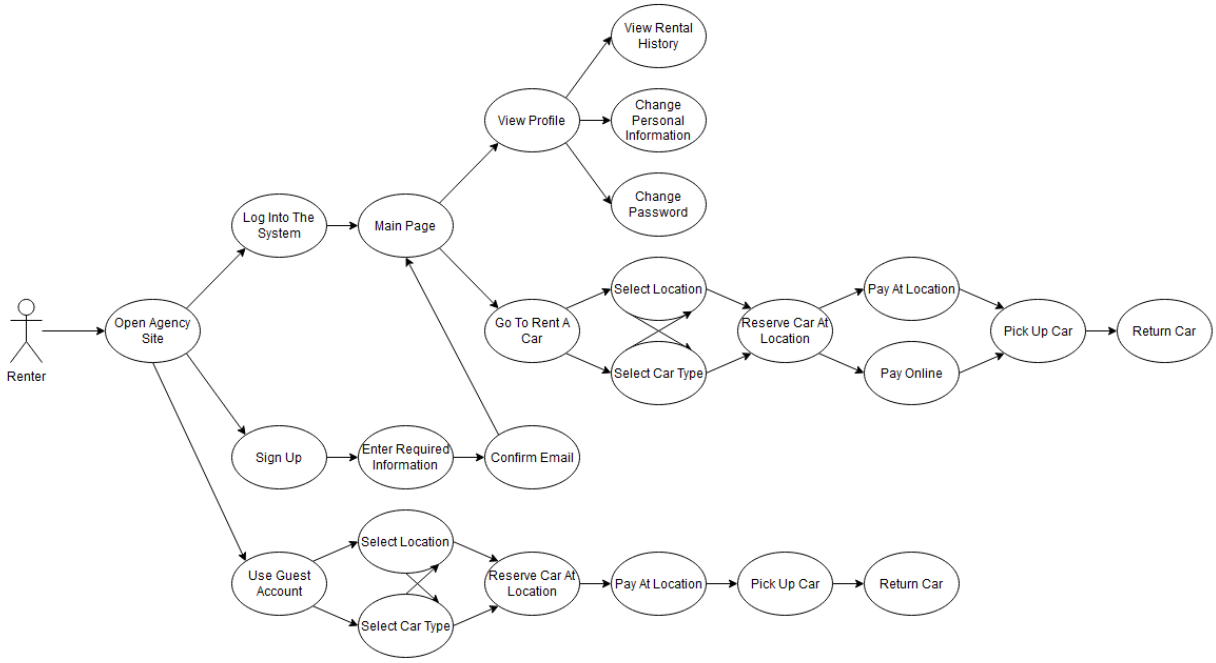
Regional Managers will have access to three databases, the Renter database, the Car database, and the Location database. They will have greater access to the first two than a Manager, able to deactivate renters and add and remove cars from the database. For the Location database, they will be able to edit the amount of cars a location is allowed to hold.



In this diagram, the regional manager logs into the system and can choose to access the location database, the car database or the renter database. When they access the location database, they can view and edit the details of a specific location.

Accessing the car database, a regional manager can either add a car to the database or view a pre-existing car. Viewing a car, they can send it in for maintenance and remove notes, transfer it between locations, or remove the car from the system. When they access the renter database and view a renter profile, regional managers can check rental history, add or remove both warnings and notes, or deactivate the account.

As the main intended users, Renters have the most options with the least access. They are able to use a guest account or sign up for and use a permanent account. From there, they will be able to rent a car and, for permanent accounts, view and edit their profile and personal information.



In this diagram, the renter opens up the agency's website or app, where they have three options; to sign into their account, sign up for a permanent account or use a guest account. Signing into a guest account requires the bare minimum of information in order to correctly pick up the car. They can then search for the desired car using location or car type, narrowing it down further by using both. They then reserve the car at the location, where they go, pay at location and pick up the car, which is then returned when they are done.

Signing up for an account, the renter must enter the required information and then find the confirmation email. Once the confirmation email has been found, the renter will be signed into the system and be on the main page, the same location that they would end up if they just logged into the system.

From the main page, a renter can either view their profile or rent a car. Viewing their profile, they can view their rental history, change their personal information or change their password. Choosing to rent a car, they can start the search by location or car type and refine the search more by using both options. Once they have located the car they want, they can reserve it and pay either online or on location when they pick up the car, which they return when they are done.

Non-functional Requirements

The system needs to focus on portability, security and reliability. For portability, the website needs to have a functional and intuitive desktop version that translates well to a mobile version. The application needs to be similar to the mobile version of the website, so that renters don't get confused and annoyed.

For the matter of security, the system has access to sensitive personal information of the renters, therefore it needs to be secure. The only ones that should be able to access that information should be the specific renter, the manager to a very limited degree and the regional manager.

Reliability is another important facet. Reserving a car should go through ideally 100 out of 100 times, but should at worst be 99 out of 100 times. There needs to be a confirmation on both the renter's and the location's end, done so that it only requires one to reserve a car in case the other is that 1 time it doesn't work.

Other than that, the system needs to be usable. No glaring color contrast and no shades that blend into the same shade of gray. Buttons should be grouped with similar buttons so that renters don't have to open seven sub-windows to make a search.

Additional

Possible Risks

There are several parts of the system where if it is done slightly wrong, maybe slow down or clutter the system. Two of these risks are deactivating a renter account and deleting a car from the database.

Deactivating a renter account might mean that the account is still there taking up space. If that is how it is done, the system may start to lag as deactivated accounts clog and take up too much processing power. In order to prevent that, either the account is completely wiped from the system upon deactivation or there is a regularly scheduled clean up of deactivated accounts to free up space.

Deleting a car from the database runs into the risk of the information not being deleted correctly. If that happens, the free floating information may interfere with the information of other cars or simply take up memory in the database. To prevent this as best as possible, deleting a car must be tested thoroughly and the database checked on a regular basis to ensure that there is nothing left behind.

There is also the risk of a data breach. Minimizing the risk to sensitive data is the most important part, in case there is one. In order to do so, the avenues of accessing that information should be as minimal as possible and two-factor authorization should be encouraged for renters.

Future Improvements

This system should be constantly evolving and being improved upon. The current design may end up having parts removed or added as needed as development progresses. Accessing the rental history for a renter may change from the profile to the account main page to streamline the process for renters.

Search saving can be implemented for renters as well, so that they can quickly search for their ideal car without continuously entering the criteria for every search. Another thing is that renters might be able to favorite cars so that they can see if it is the selected location.