Software Requirements Specification for Online Car Rental System

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Software Requirements Specification

- **Introduction**
    - Rental services are very popular since they provide the opportunity of ease of use.
    - Online Car Rental Service, which is an innovative reservation software designed for cars, may be considered one of the most important rental services.
    - Advantages of renting a car can be listed as money saving, comfort, affordability, low cost travelling and freedom of movement.
    - In this project, a requirement document is presented for an Online Car Rental Service.

- **Purpose**
    - To clearly define the requirement specification for the Car Rental System.
    - The intended audience of this document is the administrator and the end users of the system. Design, development and testing team are the other intended audiences

Software Requirements Specification

▶ **Product Scope**

Online Car Rental System is a web application which users can search for and book cars online. System will be developed according to the characteristics of the user stated as follows:

Admin:

- ▶ Login to the system
- ▶ Store, update or delete database content related cars, prices and customers

Employee:

- ▶ Login to the system
- ▶ Store and update database content related to rents
- ▶ Interface to the customer

Guest User:

- ▶ Search for cars

Member:

- ▶ Register to the system
- ▶ Login to the system
- ▶ Search for cars
- ▶ Book a car
- ▶ Update the order
- ▶ Cancel the order

Functional Requirements

- **User Requirements**
  - **Account Requirements**
    - A guest user shall be able to register to the system with their first name, last name, a driver's license, a bank card number, a phone number, an e-mail address and a valid password to become a member.
    - An admin shall be able to create employee accounts with employee social security number, first name, last name and office location.
    - An admin shall be able to update an employee account's office location.
    - An admin shall be able to delete employee accounts.
    - A member, an employee and an admin shall be able to log in to the system with an e-mail address and password.
    - A member shall verify their e-mail address using the verification code sent to their e-mail address.
    - A member shall verify their phone number using the verification code that sent to their phone number.
    - A member, an employee and an admin shall be able to change their password using their e-mail address and current password.
    - A member, an employee and an admin shall be able to change their password via a link sent to their e-mail by the system if they forget their password.
    - A member shall be able to activate/deactivate her/his membership.
    - A member, an employee and an admin shall be able to log out of the system safely.

Functional Requirements

- **User Requirements**
  - **Admin Requirements**
    - Admin shall be able to add new cars to the database with information about plate number, model, segment, price per day, fuel type, and transmission type.
    - Admin shall be able to remove cars from the database.
    - Admin shall be able to list all the rental cars in the fleet.
    - Admin shall be able to list all the employees.
    - Admin shall be able to update price per day for a rental car in the database.
  - **Employee Requirements**
    - An employee shall be able to register a new user with their first name, last name, a driver's license, a credit card number, a phone number, an e-mail address and a valid password.
    - An employee shall be able to create a reservation for a member.
    - An employee shall be able to update a member's reservation duration.
    - An employee shall be able to cancel a member's reservation.
    - An employee shall be able to track a member's criminal record background via her/his driver's license info.

Functional Requirements

- **User Requirements**

    - **Recommendation Requirements**

        - A member shall be able to pick one of the cars recommended by the system and proceed to the next steps of reservation.

        - A guest user shall be able to pick one of the cars recommended by the system and proceed to the login/membership registration page.

Functional Requirements

- **User Requirements**

  - **Search Requirements**

    - A member, an employee and a guest shall be able to search for a rental car based on rental start date, rental start location, rental end date, rental end location.

    - A member, an employee and a guest shall be able to filter their results based on car model, car segment, transmission type (automatic or manual), fuel type (diesel, petrol, electric, hybrid) and price per day.

    - A member and an employee shall be able to pick one of the search results as their rental car choice and proceed to the next steps of reservation.

    - A guest user shall be able to pick one of the search results provided by the system and proceed to the login/membership registration page.

    - A currently selected search result by a member shall be listed in new search results for other users as long as the member has not completed reservation.

    - A currently booked rental car shall not be listed in the search results until car returned.

Functional Requirements

- **User Requirements**

  - **Reservation Requirements**

    - Insurance and additional driver count selections shall be made by the member before the final price calculation.

    - Selected criteria and its final rental price shall be approved by the member for reservation.

    - A member shall be able to cancel her/his reservation not later than 3 days to the pick-up date.

    - A member shall be able to change the duration of the rent if the car is not booked by other members.

  - **Payment Requirements**

    - A member shall make the payment only by using a credit card.

    - The user shall enter their credit card details to the required credit card info fields.

    - A member or an employee shall be able to request an invoice for a rental car payment.

Functional Requirements

▶ **User Requirements**

   ▶ **Delivery and Return Requirements**

      ▶ A member shall be provided a pick-up location for their rental car via their chosen method of notification when the payment is approved.

      ▶ A member shall leave the rental car before the end of their rental end date at the rental end location.

      ▶ An employee shall create a new incident report for a rental car at the rental start date before it is handed over to the customer.

      ▶ An employee shall mark the delivery to the customer in the incident report.

      ▶ An employee shall mark it down in the incident report in the system when a rental car is returned by a member and when it was not returned in time.

      ▶ An employee shall enter the file number to the system which documents are stored related to the rent such as incident reports, signed documents by customer, etc.

Functional Requirements

- **User Requirements**

  - **Maintenance Requirements**

    - An employee shall be able to start the maintenance process when the car's periodic maintenance time comes.

    - An employee shall be able to update car's maintenance information in the database.

  - **Rating Requirements**

    - A member shall be able to rate their rental car's features in terms of comfort, price, fuel consumption, etc.

    - A member shall be able to rate their booking experience in terms of overall services.

  - **Notification Requirements**

    - A member shall be able to choose their preferred method of notification by the system as e-mail notifications or phone message notifications. At least one of the two must be chosen by the customer.

  - **Profile Requirements**

    - A user shall be able to see their profiles displaying their current reservation information and reservation history.

Functional Requirements

- **System Requirements**
  - **Profile Requirements**
    - A user profile will be created for a member, an employee and an admin account.
    - When a reservation is completed by a member, the system shall add the rental reservation information to the user's profile.
    - When a reservation is cancelled by a member, the system shall update the user profile with the related information.
    - The system shall update a user's profile accordingly when an employee makes a booking for the customer.
    - The system shall update a user's profile accordingly when an employee cancels a booking for the customer.
    - The system shall update a user's profile accordingly at the end of a rental and update the reservation history.

Functional Requirements

- **System Requirements**

  - **Recommendation Requirements**

    - A member's booking history shall be used for the recommendation system.

    - The system shall recommend rental options to a member based on their recent rental car choices and the most popular rental car choices by all members.

    - The system shall recommend rental options to a guest user based on the most popular rental car choices by all members.

    - When a guest user picks a recommended car, prior to proceeding with reservation, the system shall ask for them to login or register.

Functional Requirements

- **System Requirements**
  - **Search Requirements**
    - When a user queries a search, the system shall fetch & provide the search result to the user from the database.
    - When a guest user picks a car provided as a search result, prior to proceeding with the reservation, the system shall ask for them to login or register.
  - **Reservation Requirements**
    - Rental price based on the selected criteria shall be calculated.
    - User's criminal record shall be checked based on the info on her/his driver's license.
    - If the user is not eligible to reserve a car due to her/his criminal record, a notification shall be shown to the user regarding her/his eligibility.
    - Final rental price based on the selected criteria shall be shown to the user for approval.
    - A notification saying that "the paid amount will not be refunded due to late cancellation" shall be shown to the member if s/he tries to make a late cancellation for her/his reservation.
    - If the user requests an extension for her/his car rental date, the system shall check the database for the availability of the car.

Functional Requirements

- **System Requirements**

  - **Payment Requirements**

    - The system shall check the member's credibility info from the corresponding institute.

    - The system shall charge the member the rental amount and the deposit amount based on the selection criteria.

    - If the car is returned on-time with no damages included in the incident report, the deposit should be refunded to the member.

Functional Requirements

- **System Requirements**
  - **Delivery and Return Requirements**
    - The system shall not allow the users, who do not have a verified e-mail address, to make a reservation.
    - The system shall not allow the users, who do not have a verified phone number, to make a reservation.
    - The system shall make a rental car unavailable on the website for the dates it is rented out by a member.
    - The system shall make a rental car available on the website when it is returned by the member.
    - The system shall ensure a rental car is at the rental start location by the rental start date.
    - In case a rental car becomes unavailable based on its incident report, the system shall put all reservation options on it indefinitely on hold.
    - In case a rental car becomes unavailable based on its incident report but the car already had been reserved for dates it is now unavailable for, the system shall upgrade the car choice for the members who had reserved it prior to the incident, and notify the members accordingly.
    - The system shall notify a member of an upcoming rental via their chosen method of notification, stating the rental start date, car pick-up location, rental end date and return location.
    - In case of a traffic ticket received for a rental car during a user's rental period, the system shall withdraw the required amount by using user's bank card info.
    - The system shall notify the user with her/his preferred way of communication method if a traffic ticket received during the rental period of that user with mentioning the ticket amount received.

Functional Requirements

- **System Requirements**
  - **Maintenance Requirements**
    - The system shall make a rental car unavailable on the website for the dates it is in the maintenance process
    - The system shall make a rental car available on the website for the dates it is in the maintenance process

Non-Functional Requirements

- **Usability**
  - Help and support menus shall be provided to users while they are experiencing the car rental system.

- **Security**
  - A member's banking information shall not be seen by anyone without authorization.
  - Encryption shall be used for the members' private data.

- **Performance**
  - The system shall be able to respond to the requests in 5 secs at most.

- **Availability**
  - The system shall be available 99.95% of the time.
  - 2 web servers from each 2 data centers (main & disaster recovery data centers) shall be serving actively with a GS Load Balancing placed in front of them.
  - 2 application servers from each 2 data centers (main & disaster recovery data centers) shall be serving actively in front of a LB.
  - 2 database servers shall be serving on both data centers with synchronization available via replication.
  - Backup of database shall be taken every 5 mins in order to minimize the data loss in case of an emergency or an unexpected situation.

Non-Functional Requirements

- **Compatibility**

  - The system shall be available to use with Google Chrome, Safari, Firefox and Internet Explorer web browsers on computers and mobile phones.

- **Error handling**

  - Call-center information shall be provided to the users.

  - All information stored in the database should also be stored in a secondary backup database. In case of an incident, the data should be recovered from this backup database.

- **Ease of use**

  - User friendly web service shall be provided for the disabled users & members

  - Multiple language opportunities, English and Turkish, shall be provided.

▶ Thanks for listening!