**Software Requirements Specification**

**for**

**Travel Agency Automation Software (TAAS)**

**(Version 1.0)**

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**Revision History**

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| --- | --- | --- | --- |
| **Name** | **Date** | **Reason For Changes** | **Version** |
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**1. Introduction**

**1.1 Purpose**

Purpose of this software is to automate various operations of a typical travel agency. The travel agency has a fleet of vehicles which it rents out to customers. This automation should allow a customer to book any car online, based on the available models and also inform the customer about the estimated rental charges for the selected model type.

The customer should have a provision to book a car online by paying some advance. He should also be able to check his booking online. The travel agency manager should be able to add a new vehicle to its fleet or decommission some vehicle.

The software must keep a record of every rental booking, every maintenance or servicing activity of each vehicle and also the fuel consumption of every vehicle. Based on these records, the agency staff should be able to track the current status of any car; i.e., whether it is currently rented out or under maintenance or is available for rent.

The software should also help the agency to collect statistics about various types of vehicles: the price of the car, average amount of money spent on repairs for the car, average demand, revenue earned by

renting out the car, and fuel consumption of the car. The agency can use this statistical analysis to check which vehicles are more profitable and to also decide the rental charge for every model type.

**1.2 Document Conventions**

Nil

**1.3 Intended Audience and Reading Suggestions**

The engineering team including the software development team and the QA team, the Support team responsible for fixing issues occurring on the customer location deployment and also the sales/marketing team which is responsible for marketing this software and selling it.

**1.4 Product Scope**

The rental car agency rents out its vehicles to customers. The agency as a part of its business, can make its rental cars available in different cities as requested by customers. E.g., some tourist city can see a high volume of requests for rental vehicles during holidays or travel season. Or a large metropolitan city with a lot of corporate offices in it can experience a huge number of visitors and thereby a high demand of rental cars during week-days. In order to avoid last-minute rush to get a rental car, the customers usually prefer to book a rental car in advance at the time of making their other travel or accommodation bookings. This puts pressure on the rental car agency to be able to cater large number of booking requests during any time of the day. Moreover, the rental car agency should also be able to keep track of status of its existing fleet of vehicles and add new vehicles to serve the growing demands of the business.

Making the rental car booking facility online can enable the customer to do his bookings through his laptop or mobile phone anytime during 24x7 hours without contacting the agency office. Moreover, the agency staff can also get better control of tracking status online of its vehicle fleet and the rental bookings. This automation can also enable the agency to perform statistical analysis in order to make better decisions about which model types are in high demand or which vehicles are more profitable and by how much etc.

The scope of 1.0 version of this software is to provide the facility of booking a vehicle online, add new vehicles to the fleet and know revenue earned by any vehicle during a given time period. The scope does not include making the online payment while booking a vehicle and also checking any existing or past bookings.

**1.5 References**

Nil

**2. Overall Description**

**2.1 Product Perspective**

This software is developed from scratch and is self- contained.

**2.2 Product Functions**

The major components of this system are:

1. **Agency vehicle database:**

It stores the following data:

1. details of all vehicles such as vehicle registration ID, model type, A/C or Non-A/C, vehicle status, total running (in kilometres) till date.
2. Details of all types of vehicle expenses such as repair, servicing, fuel filling etc.
3. Rental booking details
4. Details of users who can use this software - User id, user role and password
5. **The User Interface:**

There will be a Web UI with menu options to support all supported operations of this software.

1. **Report generation:**

The Agency manager can request different types of reports based on the statistics about average maintenance expenses or average revenue generated by each model type.

Some of the important use cases are discussed below:

1. **Customer books a rental car online:**

Rental car automation S/w

Booking & vehicles database

Booking details along-with customer details

Return the booking ID

Customer

Booking request

Advance payment

Booking confirmation

1. **Agency staff allocates vehicles to the booking orders which are due in next 48 hours:**

Rental car automation S/w

Booking & vehicles database

Fetch requested booking & vehicle records

Save the updated booking and vehicle records

Agency Staff

Submit credentials

Check bookings and vehicles

Assign vehicles to the bookings and mark vehicle status accordingly

1. **Agency owner/manager requests the revenue generated by each vehicle in last one year:**

Fetch details required to generate the report

Submit credentials

Request a report

Rental car automation s/w

Agency

Manager

Vehicle database

Detail report

**2.3 User Classes and Characteristics**

Following user categories or roles are allowed in this software:

1. **Customer** – Can make online booking and check booking status or cancel any booking. Mobile number or e-mail address of the customer or a username can be used as a login ID.

The database access permissions to any customer will be limited to checking his own booking details and making a new booking.

1. **Agency staff** – Is allowed to perform all the booking operations that a customer is allowed. Additionally, he has the responsibility of allocating a vehicle to any booking. Keeps track of all the booking activities, updates the booking records with the latest payment amount when the car is returned. Also, maintains record of all the activities of every vehicle, e.g. if any car is given for a repair, then the agency staff is responsible to track and keep record of such repair activity. The agency staff is responsible to keep the status of all vehicles up-to date.

The agency staff will have a read-write access to the software database.

**Agency manager** – Is allowed to perform all the operations that an agency staff can handle. Additionally, the agency manager can also request statistics about all model types. This statistics can help the agency to know the average demand of any model type or the average profit earned by any model type. The agency manager will have read-write access to the entire database.

**2.4 Operating Environment**

**Web UI (Frontend):**

* Supported OS Platforms: Windows – 10/11 64 bit, Linux
* HTTP port: 8080
* Supported web browsers: Google Chrome, Microsoft Edge.
* The pop-ups must not be blocked on the web browser. No other special requirement about security configuration in a web browser.
* Currently the system is designed only for laptops and desktops (mobile access is not supported).

**The backend:**

* All of the above and
* Java 17, Spring Boot 3.05, Node.js v16.13 and PostgreSQL v15

**2.5 Design and Implementation Constraints**

* This application should have permission to use HTTP port 8080.

* The database service PostgreSQL server must be configured to run continuously on the backend/server machine.
* Simultaneous access to bookings will not be tested in 1.0 version of this software.
* The software will be tested only on English O.S.
* Other utilities such as ‘Postman’ should be allowed to run on the actual site for quick sanity checks.

**2.6 User Documentation**

Nil

**2.7 Assumptions and Dependencies**

Nil.

**3. External Interface Requirements**

**3.1 User Interfaces**

The Web UI makes HTTP requests to the server. Each request will contain HTTP action verbs such as GET, POST, PUT or DELETE. The server in turn is responsible to carry out the requested action and send an HTTP response to the client. The server will send client the HTTP status code as a part of the response which will indicate whether the requested action was carried out successfully or reason of the error occurred, if any.

**3.2 Hardware Interfaces**

Not Applicable.

**3.3 Software Interfaces**

The Web UI of this software runs on web browsers such as Google Chrome or Microsoft Edge.

The backend system needs a runtime environment of Java 17 and PostgreSQL v16.13. The database service namely PostgreSQL server must be configured to run continuously on the backend/server system.

The Web UI communicates with the backend system using HTTP protocol.

**3.4 Communications Interfaces**

* The Web UI communicates with the backend system using HTTP protocol. This communication can also be secured by supporting HTTPS protocol in future version of this software.

The software should also send an e-mail to the customer once the booking is confirmed. This functionality would require an interface with SMTP server. However, this functionality is not supported in version 1.0 of this software.

**4. System Features**

**4.1 Allow online booking of a car**

**4.1.1** **Description:**

When a customer requests for a car, the company lets them know what types of vehicles are available, and the charges for each car. When a customer books a car, he has to deposit an advance amount.

**Priority:** High

**Risk:** Multiple simultaneous requests cannot be tested in version 1.0 of this software.

**4.1.2 Stimulus/Response Sequences**

Customer accesses the Web UI of this software by typing its URL in the Web Browser on his desktop/laptop. Next, he chooses the concerned menu option to request a new booking.

As a result, a form would appear on the screen where customer can fill-in details such as from which date and time, he needs a vehicle and till which date and time. He can also specify details such as a make and model of the vehicle, with or without air conditioning. Based on these choices, the software in turn would calculate the rental charge along-with the tax amount and would prompt the user to either proceed towards making advance payment or change the specifications and re-calculate the rental charge or abort the current booking activity.

**4.1.3 Functional Requirements**

**REQ-1:** Take details from the user such as: date and time from when a rental car is needed and also the tentative date and time of return. The UI should also allow user to specify choices about model and make of the vehicle.

**REQ-2:** Basedon the chosen time-frame and make and model of the vehicle, the software should check if the agency can make available a vehicle of that type during the said timeframe.

**REQ-3:** The software should display rental charges along-with taxes when user fills in above mentioned details. And prompts the user to either proceed towards making an Advance payment or re-fill his choices or cancel the current activity.

**REQ-3:** When customer chooses an option to make an advance payment, the software should take the name and contact details of the customer. Mocking the payment gateway is not supported in v1.0 of this software.

**REQ-4:** At the end of a successful booking, the software should display the booking details to the customer. Sending the booking confirmation via an e-mail or message is not supported in v1.0 of this software.

**REQ-5:** The user roles allowed to perform above operation are: customer, agency staff, agency manager.

**REQ-6:** On successful completion of booking activity, the agency staff or manager must allocate a vehicle with the requested make and model to this booking.

**4.2 Allow addition of a new vehicle to the fleet**

**4.2.1** **Description:**

The company can acquire new vehicles and add them to the fleet of its vehicles. Only the users with role as agency manager will be allowed to perform this operation.

**Priority:** Medium

**4.2.2 Stimulus/Response Sequences**

When the user with a role of type agency manager logs into the Web UI of this software, he gets a menu option to add a new vehicle. On selecting this option, the software will prompt the user to specify details of the new vehicle to be added to the system. The details will be such as make and model type of the new vehicle, purchase price, vendor details, initial kilometres on the vehicle and most importantly its registration Id.

**4.2.3 Functional Requirements**

**REQ-1:** Take details of the new vehicle such as its registration Id, make and model type, purchase price, vendor details, initial kilometres on the vehicle.

**REQ-2:** The software should check if a vehicle with the specified registration Id already exists in its fleet. If so, it should prompt the user with an error.

**REQ-3:** On successful addition of the new vehicle, the new vehicle should hold a valid state such as available for renting.

**REQ-4:** Users with agency manager role only are allowed to perform this operation.

**4.3 Generate a report of revenue generated by some vehicle**

**4.3.1** **Description:**

The company wants to collect statistics about various types of vehicles. As a part of it, the company wants to get a report of the revenue generated by any vehicle during a given time frame, say last one year or so.

**Priority:** Low

**4.3.2 Stimulus/Response Sequences**

When the user with a role of type agency manager logs into the Web UI of this software, he gets a menu option to get a report of the revenue generated by any vehicle. On selecting this option, the software will prompt the user to specify the make and model of the vehicle. Then, it should allow the user to select the vehicle with a particular registration Id. When a vehicle is chosen, next it should take the time frame during which it needs to access and analyse the data. The report generated after the analysis should be shown on the screen. E-mailing the report is not considered in this version of the software.

**4.3.3 Functional Requirements**

**REQ-1:** Take details of the vehicle such as its make and model type, registration Id. Then, take the time period during which it needs to analyse the data to generate the report.

**REQ-2:** The software should perform all the necessary calculations to generate the requested result.

**REQ-3:** The generated report should be shown on the screen in the form of a multi-line read-only text control.

**REQ-4:** Users with agency manager role only are allowed to perform this operation.

**5. Other Non-functional Requirements**

**5.1 Performance Requirements**

When the user is accessing the UI, it should be responsive with taking a reasonable amount of time for performing any operation.

**5.2 Safety Requirements**

Not Applicable.

**5.3 Security Requirements**

Version 1.0 of this software supports only the HTTP mode of communication. Hence, the issues related to security or privacy cannot be addressed in this version.

**5.4 Software Quality Attributes**

The software should be easy to operate especially for the customer type of user role, so that a person with an average digital literacy should be able to access its online booking services in the role of a customer.

The software should be robust, give appropriate errors in case of error conditions in the form of HTTP status codes or so and should not crash.

**5.5 Business Rules**

The software allows three different kinds of roles such as customer, agency staff and agency manager.

1. **Customer** – Can make online booking and check booking status or cancel any booking. Mobile number or e-mail address of the customer can be used as a log-in ID.
2. **Agency staff** – Is allowed to perform all the booking operations that a customer is allowed. Additionally, he has a responsibility to allocate a vehicle to any booking. Keep track of all the booking activities, update the booking records with the latest payment amount when the car is returned. Also, maintain record of all the activities of every vehicle, e.g. if any car is given for a repair, then the agency staff is responsible to track and keep record of such repair activity. The agency staff is responsible to keep the status of all vehicles up-to date.
3. **Agency manager** – Is allowed to perform all the operations that an agency staff can handle. Additionally, the agency manager can also request statistics about all model types. These statistics can help the agency to know the average demand of any model type or the average profit earned by any model type.

**6. Other Requirements**

Not Applicable.

**Appendix A: Glossary**

* HTTP – HyperText Transfer Protocol. Type of a network protocol.

**Appendix B: Analysis Models**

**Appendix C: To Be Determined List**