SOFTWARE REQUIREMENTS SPECIFICATION

for

Vroom Truck Pooling Web Application

Version 1.0

Prepared by

A Susmithaa Raam (18 5001 181)

Vanathi G (18 5001 188)

N Veeraraghavan (18 5001 191)

B Vignesh (18 5001 193)

CSE Dept,SSNCE

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1. Introduction

Transportation trucks are manually hired by customers based on the availability and requirements. Transportation of industrial or agricultural goods from one place to another at a reasonable cost via reliable means has become a daunting task. This is an even bigger problem when small-scale users hire an entire truck to transport a small amount of goods as fuel and other resources get wasted in this case. The driver's earnings also get affected as the capacity of his truck is not efficiently used. Either the drivers are forced to take up a consignment and charge low for it or the customer is forced to pay a lot in order to transport it on time.

An investigation is going to be carried out on the online truck sharing system. Drivers can be directly hired by clients based on their requirements to transport their goods. In simple words, it acts like an *Uber Pool* or *Ola Share* for trucks to transport different kinds of goods. Drivers can advertise their availability, current routes and maximum capacity to maximise their profits. Clients can hire nearby drivers based on the type of goods and destination. The driver can also be mapped to a new order on the way so that the available space can be shared with the existing order he is carrying. Based on the destination and available capacity, the application will suggest an optimal route and allow minor diversions to pick up other orders along the same route. The application will also make sure the same truck will not carry incompatible types of goods. In this way it becomes economically profitable for the customer as well as driver. Additionally it will also enable customers to post their requirements and drivers can bid on this which results in the cheapest bidder getting the trip.

1.1. Purpose

The purpose of this *Software Requirements Specification (SRS)* document is to describe the external behaviour of the Online Truck Sharing System. Requirements specification defines and describes the operations, interfaces, performance, and quality assurance requirements of the Online Truck Sharing System. The document also describes the nonfunctional requirements such as the user interface. It also describes the design constraints that are to be

considered when the system is to be designed, and other factors necessary to provide a complete and comprehensive description of the requirements for the software. The *Software Requirements Specification (SRS)* captures the complete software requirements for the system, or a portion of the system. Requirements described in this document are derived from the Vision Document prepared for the Online Truck Sharing system.

1.2. Document Conventions

- OTSS - Online Truck Sharing System
- DB - Database

1.3. Intended audience and Reading suggestions

This project is a prototype for the online truck sharing system and it is restricted within the college premises. This has been implemented under the guidance of a college professor. This project is useful for the Truck management team (drivers) and as well as the hirers of trucks.

The document is organized in accordance with IEEE SRS template and will provide an overall description of the project with regards to features, user classes, implementation constraints and assumptions followed by details of the system features in the form of use case descriptions and diagrams and closing with Non-functional requirements.

1.4 Product Scope

The Online Truck management system that is to be developed provides the industries, customers and drivers with information on orders and availability with online booking and reviewing facilities.

The project is intended to fulfil the requests set forth by the hirer to get trucks at economical price satisfying the delivery deadlines. The project will contain a booking platform, a platform where drivers can post their availability and one

where drivers can bid to get trips based on listings of customers. The new online system will be accessible through the website. Some staff only features will not be available for all. All secure access will be authenticated either via staff login or guest details. The payment and financial management will not be handled by this system.

1.5. References

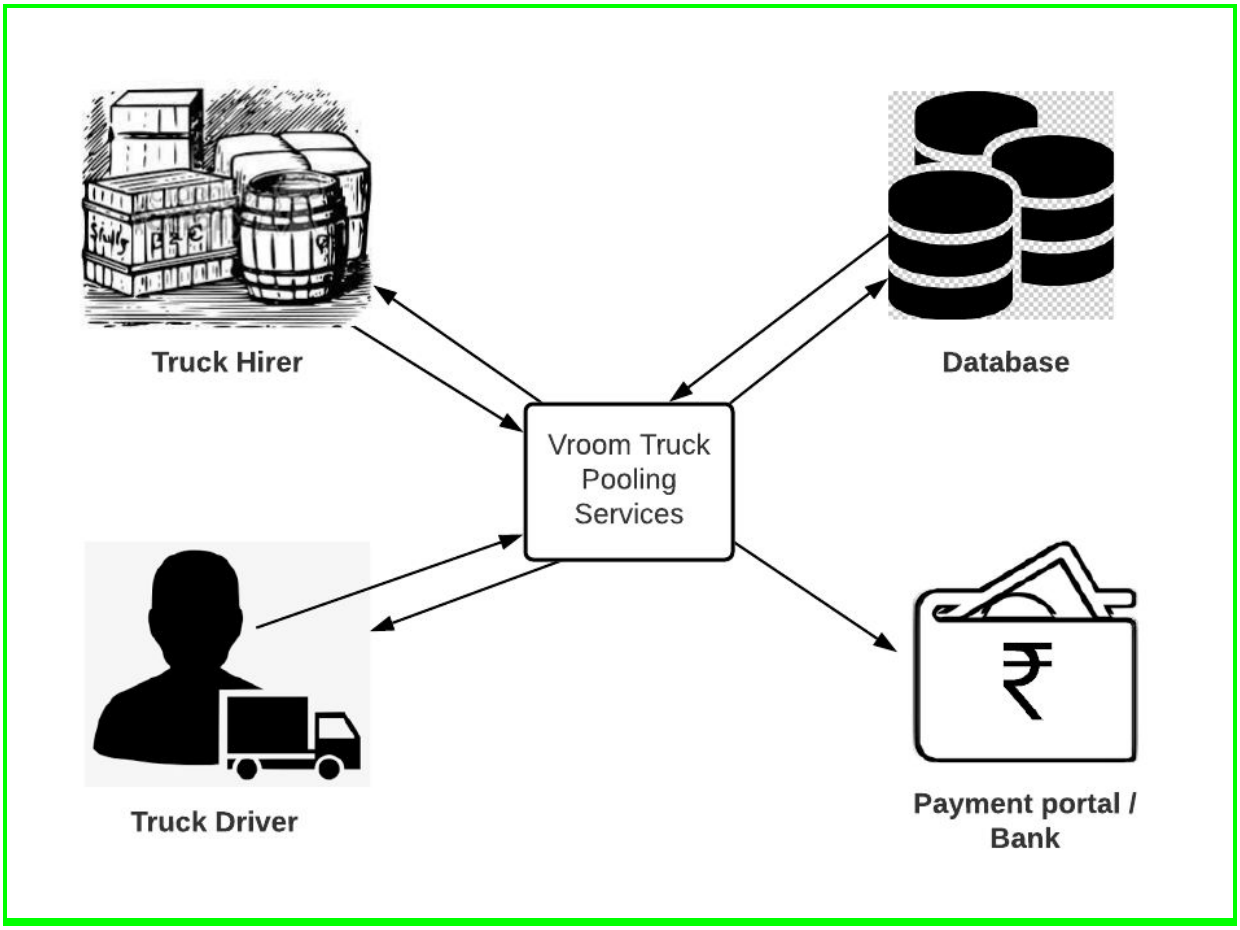
1. SRS document specification by IEEE
2. A software tool for commute carpooling: a case study on university students in Milan
3. Ola/ Uber Open source docs

2. Overall Description

2.1 Product Perspective

The Truck Pooling Web Application is designed to be used by clients who want to hire truck drivers to transport their goods. The advantage of this product is that it allows truck-pooling similar to car-pooling systems. A single truck driver can carry goods from several clients at once; therefore several clients essentially share the capacity of a single truck. This is a self-contained product that aims to provide both truck drivers and their potential clients with a platform to connect and conduct business efficiently.

The product to be developed has interactions with the following users and systems - truck drivers, hirers, administrators, databases and the payment portal/bank. The diagram below illustrates a complete overview of the system:



2.2 Product Functions

Vroom Pooling bridges the gap between the seller and buyer in terms of distance and cost by ensuring cost-effective pooling of trucks to transport agricultural/industrial goods from one location to another. The system's basic functionality is as follows:

- The seller(User1) can hire a driver's truck to transport his goods to a given destination at booking time/a pre-booked time.
- Drivers are enabled to share their current location and remaining holding capacity of their trucks, to the system.
- The system hires the truck (stationary/travelling) closest to the hirer in real time, for the user.

- Optimal routes to reach the destination are suggested to the driver by the system.
- The system notifies the driver of pick-up orders on his way to make further efficient usage of the capacity of his truck.
- A payment link is provided to the user to pay for the service, which is in turn paid to the driver after deducting commission to Vroom.

2.3 User Classes and Characteristics

The users of the system are the truck drivers, hirers and administrators. The truck drivers and hirers are expected to have a basic knowledge of working with computers, mobile devices or tablets, web browsers and the internet. Administrators are assumed to have knowledge about the internals of the system and should be able to rectify errors that may arise due to disk crashes, power failures and other catastrophes. The user-friendly interface and online help will be sufficient to educate users on how to use the system without issues.

2.4 Design and Implementation Constraints

- A truck in order to be hired in service for a user, must be within a 5km radius of the user's source location as well as have enough holding capacity for the user's goods requirement.
- The system must be running 24*7 for use to receive orders from users and send notifications to drivers.
- The system must work in real time to send notifications between the driver and the hirer.
- The hirer and the driver must be connected to a good internet source.

2.5 Assumptions and Dependencies

- The users must have sufficient knowledge of computers or other mobile devices and the internet.

- The user's computer or mobile device must have internet connection to access the application.
- The users should have a basic understanding of the English language as the user interface will be provided in English.
- The product can access the truck database.

3. External Requirements

3.1. User Interface

Since the application is web based, the main interaction is between the user and a web browser (Firefox or Chrome) and the GUI guidelines for an interactive e-commerce website will be followed.

The standard tabs would be:

1. Home: The home tab will contain information about the company, pricing and policies
2. Hire: The hire tab will contain the search box to hire for a specific route
3. Transporters: The transporters tab is the driver's hub where they can enter their route and truck information
4. Contracts: The Contracts tab is used by companies to hire multiple trucks as part of a contract
5. Help: The Help tab contains customer support and contact information.

The Hire tab will have filters to differentiate between multiple drivers in the same route. Advanced algorithms will be used to choose the best transport depending on the customer's needs. The entire web application will be lightweight and fast. It will also be designed with mobile use in mind.

3.2. Hardware Interface

The application is highly dependent on the location of the customer. So it will use the GPS signal to find the same. It will also use the networking (LAN) built into the customer's device to connect to the main servers.

The same will be true for the transporter but the difference here is the location sharing would be continuous so that the customer can track his consignment. The camera will also be used to authenticate the pickup and delivery of the consignment at the source and destination respectively.

3.3. Software Interface

The application will use Google Firebase as it's database backend. It will also use RazorPay as it's payment gateway. It will use Google Maps api to get location information, route information, ETA, speed and traffic data to better serve the customer.

It will also use a firewall, encryption and a hosting service with DDOS protection for enhanced safety.

3.4. Communication Interface

The application will be connected to the internet. It will require HTTPS and FTP support. It will also require a compatible web browser, network server, email and strong encryption scheme.
Since the application works in real time, synchronization is also needed between the different functions.

4. System Features (Functional Requirements)

4.1 Booking of shared trucks

The hirer will enter the destination, his location, type of truck he needs, date of delivery and quantity of goods. Then the hirer will be able to see a list of available trucks that match the criteria. Once the hirer selects and places a request for the truck, the driver will be notified for confirmation. Once confirmation is received from both parties, the truck will be dispatched to the hirer's location. Upon arrival, the driver will have to enter an OTP sent to the hirer's device. After loading the goods, the hirer will be able to track the vehicle till the goods are delivered. To ensure the goods are delivered correctly to the destination, the driver will have to enter an OTP sent to the recipient.

4.2 Bidding of orders

The hirer will enter the destination, his location, type of truck he needs, date of delivery and quantity of goods. Upon submitting the request, the information will be posted in a requirements dashboard. This board is visible only to drivers and not to other users. If a driver wants to take up a particular order, he can post his best offer for the trip on the board. Similarly, multiple drivers can bid for a particular trip over a limited amount of time. Upon completion of the bidding time, the bidder with the least offer will be assigned to the trip.

4.3 Contracts

If a hirer requires several drivers at once for a bulk delivery then he/she can post the required information such as destination, location, type of truck, date of delivery and quantity of goods on the contract dashboard. Drivers will be able to view this dashboard. Drivers who are interested can sign up on the dashboard to accept the contract. The application will assign drivers to the order on a first-come-first-serve basis. Contract offers will expire by a set deadline if no one responds.

4.4 Driver and hirer sign-up / login

Drivers can sign-up on the website using their email address or phone number and can post the information about them such as name, address, data about truck(s) owned etc. Hirers can also similarly sign-up and post their personal information. Once signed-up, a login functionality will be provided to ensure security.

5. Non Functional Requirements

5.1. Performance Requirements

1. *Response time* - The main page should be downloaded within 10 secs using a 512K modem. The info is refreshed every minute. The access time on a mobile device should also be low. The system should respond under 2 seconds. Larger jobs can take more time.
2. *Capacity* - The system should handle around 300 users at a time
3. *Resource Utilization* - The resource should be allocated dynamically as per the system load

5.2. Safety Requirements

The product might lead to loss in consignment or damage. It might also lead to mismatch during delivery. This is fixed by using OTPs at both ends and scanning of the product during pickup and delivery.

5.3. Security Requirements

Location data, payment data and general metadata of the users will be protected using advanced encryption policies under ISO 2001.

5.4. Software Quality Attributes

The application should be adaptable and expandable to add further functionality. It should also be reliable and time sensitive because of the time sensitive nature of the functions. It should be reusable for other specific applications. The application’s reliability should not exceed 2 failures/mismatches per day.

5.5. Business Rules

Customers cannot directly access the driver and vice versa. Customers cannot see the requirements of other customers. Drivers also cannot access customer information. The admins cannot directly interfere with the algorithm and they cannot access confidential customer data unless explicitly called for.