SOFTWARE REQUIREMENTS SPECIFICATION

for

TransportX

Transportation Company Computerization Software

Version 1.0.2 approved

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Revision History

Name	Date	Reason For Changes	Version
1	15/03/22	The entire SRS has been formulated	1.0.0
2	17/03/22	The Use Cases and diagrams are updated	1.0.1
3	18/03/22	Class Diagram are updated	1.0.2

1 Introduction

1.1 Purpose

The document "Software Requirements Specifications for **TransportX** *Transportation Company Computerization Software*" is focused on describing the specifications of **TransportX** our Transportation Company Computerization Software (TCCS). This is the initial document specifying the first release of TransportX. TransportX will have immense impact in the field of transportation and will revolutionise online delivery of items for many companies. This SRS is going to cover the entire specifications of the software.

1.2 Document Conventions

These are some of the abbreviations we are going to use, further in this document:

- SRS: Software Requirement Specifications
- TCCS: Transportation Company Computerization Software
- GUI: Graphical User Interface

1.3 Intended Audience and Reading Suggestions

This document is written for in-depth understanding of the software, needed for software developers and product managers, as well as a rudimentary understanding for all levels of users, which includes Manager, Employees and Customers. Although it is recommended to read the entire SRS, if a reader wants a broad understanding, the reader may skip the technical sections and focus on Overall Description and skim through Data Structure.

1.4 Project Scope

TransportX is a software intended to benefit the companies involved in transportation of goods, in record keeping and asset management. These firms receive a lot of consignments to be delivered, which come in a plethora of sizes, and handling these packages and their transportation to offices across different geographic locations is a tough task. We are developing TransportX to cater these needs of transportation agencies and bring in computerised and formal procedures in a largely informally handles sector. This would also help to improve productivity, save cost, time, and decrease the need of manual work.

1.5 References

This SRS has been written, keeping in mind the IEEE Standard 830-1998 (Revision of IEEE Std 830-1993)

2 Overall Description

2.1 Product Perspective

The world is speeding by day in, and day out and staying up to date with it is no easy task. With the ever increasing population and the sudden increase in the number of products being bought in e-markets, it is obvious the only limiting factor now becomes that of transportation, this is why we had choose to do this project in the course of Software Engineering Lab. The increase in speed in delivery and the optimised efficiency our software can provide can substantially solve this issue.

2.2 Product Functions

We allow the multiple functionaries for Manager, Employee, and Customers of the transportation office in whose office this software is implemented.

Manager Functionaries-

- Buying new trucks
- Viewing Consignment Status
- Viewing Truck Status
- Viewing Average Waiting Time of Consignment
- Viewing Average Truck Idle Time
- Viewing Truck Usage
- Viewing Branch Consignment Handling

Employee Functionaries-

- Dispatching Truck
- Validating consignment
- Receiving Truck

Customer Functionaries-

- View truck and route details
- Place order

2.3 User Classes and Characteristics

Our Software has been developed with the ideals of user ease of use such that users of any classes are able to use the software without any confusion, although there are different functionalities provided to different users on the bases of privilege level for security reasons, thus the various user classes are-

- Manager
- Employee
- Customer

2.4 Operating Environment

The Hardware Reuirements of the Software are as follows-

- 2 GB RAM
- Window XP or higher, Linux, MacOS
- 500 Mb of available space on Hardisk
- Intel Pentium Dual Core or any other chip with equal or greater computing
- Keyboard and mouse to navigate the UI

The Software Requirments of the Software are as follows-

- Java JDK version 17.0.1 and higher
- Window XP or higher, Linux, MacOS
- JRE version 1.8.0_311

2.5 Design and Implementation Constraints

Although the software will be made in such a way as to fulfil the needs of the user and as to provide them with a way to use all functionaries needed keeping in mind data security. Keeping all these in mind there are always unpredictable conflicts in usability which can limit some functionaries of certain users these can be any of the following-

- Corporate or regulatory polices
- Hardware limitations
- Software limitations
- Language Barrier

- Communication Protocols
- Security considerations
- Interfaces to other applications

2.6 User Documentation

In any good Software there should always be help given to users to easily understand how to use this, we will provide this by issuing the following means of help-

- User Manuals
- On-line Help
- Video Tutorials
- Ad-hear to Standards protocols to increase usability

2.7 Assumptions and Dependencies

Although good Software have minimal Assumptions such that they are always up and ready to use, there will always be some Dependencies and Assumptions that will affect the Software such as-

- Constant Connection to Internet for continuous transfer of information
- Increase in Security could prevent the use of some functionalities by some user classes
- Increase in Hardware demand and Software Requirements in the future versions of this software
- Using sensors which are working in all times of day through multiple different types of weather to relay constant stream of data
- Calculating the time based on expected time without considering any major delays like accidents
- Assuming that the volume entered in the Software is accurate
- The travel time between offices is negligible
- After reaching an office the truck stays there and does not automatically come back

3 External Interface Requirements

3.1 User Interfaces

TransportX will provide a user interface which will be easy to use by all users of all classes with different privilege levels, the important details of the user interface is as follows-

- Only mouse and keyboard are required for interacting with the system.
- With full screen layouts such that people of all ages can use the software
- Comprehensive Error Management and output of ERROR messages to increase usability
- Buttons on every screen with labels to easily access and input data
- Text Fields and Drop Down Menus to improve User Interface
- Synced sql database for all components so the users of all classes can access all required info from anywhere
- Cross Platform Implementation to greatly improve usability and to make users of all classes independent
- Different Windows to output a comprehensive line of information to different users such that it doesn't get confusing

3.2 Hardware Interfaces

It is important to understand the need of Hardware to operate such a Software, the important details of these are as follows-

Hardware- A Personal Computer of Laptop which has the at least the following minimal specifications-

- 2 GB RAM
- 500 Mb of available space on Hardisk
- Intel Pentium Dual Core or any other chip with equal or greater computing
- Keyboard and mouse to navigate the UI

Operation System- Windows XP or higher, Linux, MacOS

Internet Connection- Either LAN connection or Wi-Fi connection, but must be uninterrupted so as to allow a steady stream of data from all fronts such as trucks, customer, and branch offices.

3.3 Software Interfaces

TransportX will be connected to an online database will will be maintained on the office side which both employees and managers can access. the customers will have to go to the office to update the database with their consignments and information if they are previously not registered. Once given when the minimum value of 500 m^3 has been reached the truck is called for and is sent to the destination office which thereby further updates the value of the consignments and truck details in the database.

The software will be formulated in a JAVA integrated development environment using IntelliJ IDEA 2021.3.2 (213.6777.52 build).

No other software interface required.

4 System Features

4.1 Issuing the Bill

4.1.1 Description and Functional Requirements

When a company needs to deliver a new consignment, it collects the following details from the customer:

1. Volume
2. Receiver
3. Source Office
4. Destination Office

Then the program will compute the cost that needs to be given for the delivery, based on the locations of the offices, and volume of consignment.

4.2 Dispatch the Consignment

4.2.1 Description and Functional Requirements

The truck, when fully loaded to be sent to a location, the consignment is dispatched.

4.3 Allot Truck the Consignment

4.3.1 Description and Functional Requirements

We know that a truck is allotted to be sent to a location, when the delivering volume to the destination is 500 m^3. So, whenever that happens, we allot a truck to be sent to the destination office.

4.4 Compute the Delivery charge

4.4.1 Description and Functional Requirements

We calculate the cost of the delivery and the revenue associated, considering various factors, which includes locations of the offices, availability of trucks, priority delivery and volume of consignment.

4.5 Update the Database

4.5.1 Description and Functional Requirements

Program updates the master database according to the activities of the manager, employees and customers, whenever they use their functions. The data is entered, modified, accessed or deleted based on these actions.

5 Other Nonfunctional Requirements

5.1 Bill Format

The Bill should include the consignment number, volume, sender's name and address, and receiver's name, and address and should be transmitted with the truck.

5.2 Revenue Statistics Report

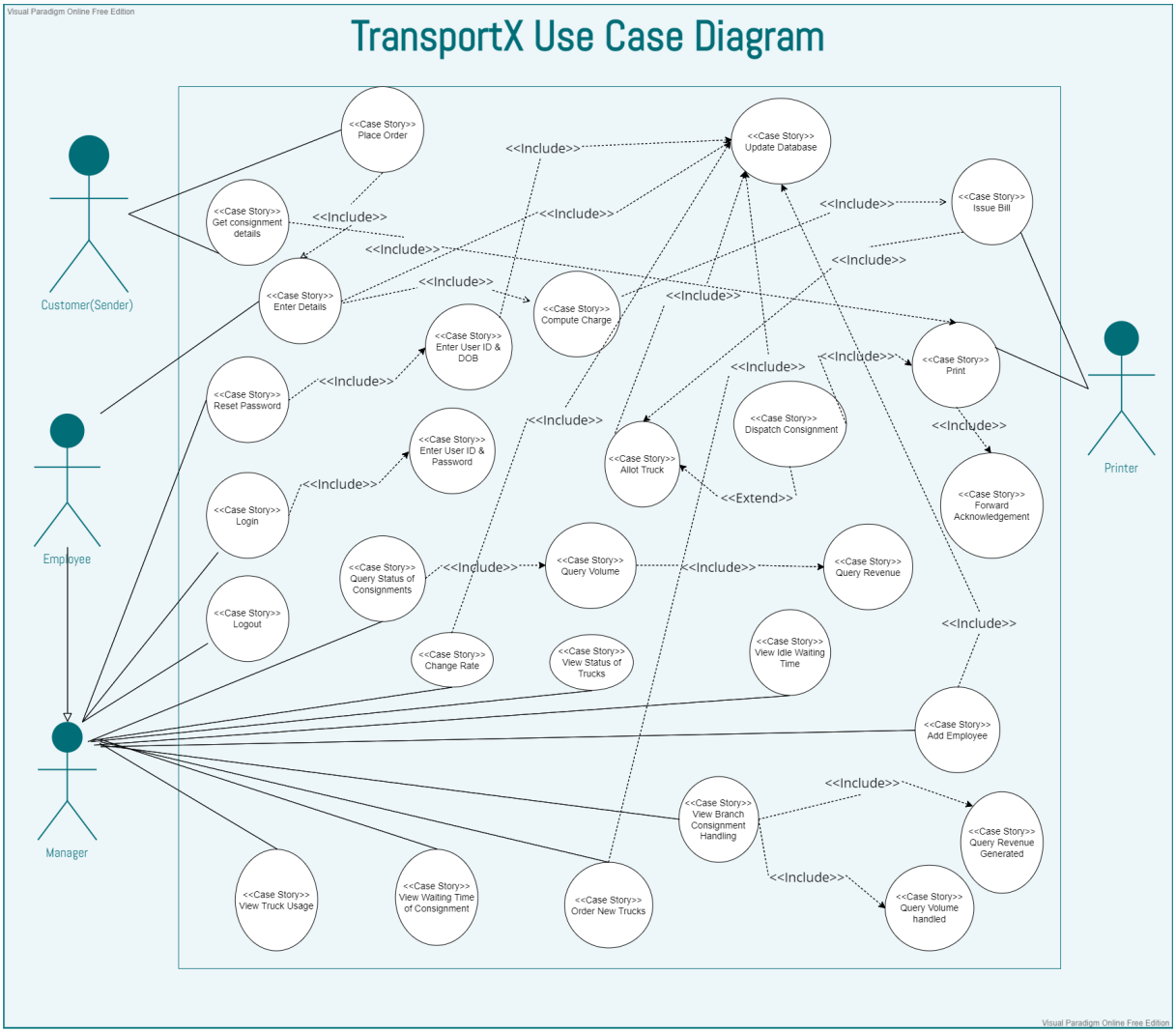
The overall details of consignment handled , the revenue generated and, the relevant metrics, should all be included in the revenue statistics report.

5.3 Security Requirements

This system's security is unimportant to it. Passwords can be stored in a "serializable" file in the database, and there is no requirement for a password recovery function or a lockout after a number of failed login attempts. As a result, when security is a problem, the system may not function properly. We do not require users to use "strong passwords." A strong password is one that fits a number of parameters that are put in place to prevent an attacker from readily guessing a user's password. These guidelines generally involve ensuring that the password has a suitable number of characters and includes not only lowercase letters but also caps, digits, and, in certain situations, symbols.

6 Use Cases

6.1 Use Case Diagram



Elements	Description
Actors	Their names are written in the centre of oval shapes. These correspond to the direct system functions that must be implemented.
Use Cases	Oval forms with their names in the center. These reflect direct system functions that must be implemented.
Interactions	Lines dotted with the term "<<include>>" that connect two use cases and include an arrow pointing to one of them This signifies that the use case with the arrow invokes the functionality of the use case without the arrow.
Includes	Dotted lines with the word "<<include>>" that link two use cases and include an arrow pointing to one of them This indicates that the functionality of the use case without the arrow is invoked by the use case with the arrow.
System Boundary	The big rectangle encloses the Use Cases. The system is responsible for implementing everything within the rectangle.
Type	A field in the use case template that indicates whether the use case is directly interacted with by an actor (Primary) or not (Secondary), as well as whether it is required for the system to work.
Use Cases	A field in the use case templates that specifies which additional use cases must be run before the current use case.

6.2 Use Cases

6.2.1 Use Case: Log in

Actor:Manager and Employees
type:Primary and Essential
Description:The Manager and Employees are asked for their UserID and password to login to the system.
Includes:Enter UserID, Enter Password
Use-Cases:NA

6.2.2 Use Case: Place Order

Actor:Customer
type:Primary and Essential
Description:The customer enter the details of the consignment and places the consignment in the office to be shipped to the given destination
Includes:Enter Details
Use-Cases:NA

6.2.3 Use Case: Enter Details

Actor:Employees
type:Primary and Essential

Description:The Employee enters the required details for the consignment to be stored in the warehouse to be shipped to the destination at a later date.
Includes:Compute Charge, Generate Bill, Update Database
Use-Cases:Place Order

6.2.4 Use Case: Compute Charge

Actor:NA
type:Secondary and Essential
Description:The system calculates the charges for an consignment that has to be shipped from one office to another based on volume
Includes:Generate Bill
Use-Cases:Enter Details

6.2.5 Use Case: Generate Bill

Actor:Printer
type:Primary and Non-Essential
Description: The system would generate the bill based on the details enter about the consignment and the given cost per volume.
Includes: NA
Use-Cases: Compute Charge, Allot Truck

6.2.6 Use Case: Allot Truck

Actor: Employee
type: Secondary and Essential
Description: After reaching $500m^3$ volume to be transported to a particular destination a truck is allotted for this purpose
Includes: Update Database
Use-Cases: Issue Bill

6.2.7 Use Case: Update Database

Actor: NA
type: Secondary and Essential
Description: The system updates the database after every update of such as consignment being sent, or truck be allotted
Includes: Allot truck, Change rate, Order new truck, Add Employee, Enter Details, Enter UserID and DOB
Use-Cases:NA

6.2.8 Use Case: Dispatch Consignment

Actor: NA
type: Secondary and Essential
Description: When the consignment for a particular office as its destination reaches the minimum value a truck is allotted and the consignments are dispatched
Includes: Print
Extends: Allot Truck

6.2.9 Use Case: Print

Actor: Printer
type: Primary
Description: Prints required Bill and Consignment order to be sent with the truck
Includes: Forward Acknowledgement
Use-Cases: Dispatch Consignment, Get Consignment Details

6.2.10 Use Case: Forward Acknowledgement

Actor: NA
type: Secondary and Essential
Description: Acknowledges the Bill details and the truck which holds the consignments being sent so as to have a record of it being sent
Includes: NA
Use-Cases: Print

6.2.11 Use Case: Enter Password

Actor: Employees and Manager
type: Primary and Essential
Description: Employees and Managers are asked to enter password so as to login to the system
Includes: NA
Use-Cases: Log In

6.2.12 Use Case: Log Out

Actor: Employees and Manager
type: Primary and Essential
Description: Employees and Managers logout from the system
Includes: NA
Use-Cases: NA

6.2.13 Use Case: Query Status of Consignments

Actor: Manager
type: Primary
Description: Manager queries the status of consignments
Includes: Query Volume of Consignments
Use-Cases: NA

6.2.14 Use Case: Query Volume of Consignments

Actor: Managers **type**: Secondary
Description: Manager queries the volume of consignments being sent
Includes: Query Revenue
Use-Cases: Query status of consignments

6.2.15 Use Case: Query Revenue

Actor: Manager
type: Secondary
Description: Manager Queries the revenue generated for all consignments.
Includes: NA
Use-Cases: Query Volume

6.2.16 Use Case: Query Revenue Generated

Actor: Manager
type: Secondary
Description: Manager Queries the revenue generated for the consignment of a particular office
Includes: NA
Use-Cases: Query Volume

6.2.17 Use Case: Query Volume of Consignments

Actor: Managers
type: Secondary
Description: Manager queries the volume of consignments being sent
Includes: Query Revenue
Use-Cases: Query status of consignments

6.2.18 Use Case: Query Volume Handled

Actor: Managers
type: Secondary
Description: Manager queries the volume of consignments handled per office being sent

Includes: Query Revenue
Use-Cases: Query status of consignments

6.2.19 Use Case: Change Rate

Actor: Managers **type**: Primary
Description: Manager changes the rate of the consignment shipping to different offices
Includes: Change Database
Use-Cases: NA

6.2.20 Use Case: View Status Of trucks

Actor: Managers
type: Primary
Description: Manager views status of truck at any time
Includes: NA
Use-Cases:NA

6.2.21 Use Case: View Idle waiting time

Actor: Managers **type**: Primary
Description: Manager can view the idle wait time for any truck
Includes: NA
Use-Cases: NA

6.2.22 Use Case: Add Employee

Actor: Managers **type**: Primary
Description: Manager can add employees and assign them to an office
Includes: Update Database
Use-Cases: NA

6.2.23 Use Case: Order New Trucks

Actor: Managers **type**: Primary
Description: Manager has the functionality to order new trucks
Includes: Update Database
Use-Cases: NA

6.2.24 Use Case: View Waiting period of a Consignment

Actor: Managers **type**: Primary
Description: Manager has the functionality to view the wait time of any Consdignment at any given point.
Includes: Update Database
Use-Cases: NA

6.2.25 Use Case: Reset Password

Actor: Managers and Employees **type**: Primary and Non-Essential
Description: Manager and Employees have the functionality to change the password they use to enter the system at any time.
Includes: Update Database, Enter UserID and DOB
Use-Cases: NA

6.2.26 Use Case: Get Consignment Details

Actor: Customer **type**: Primary
Description: Can get the Consignment Details of any previously sent consignment by that customer
Includes: Print
Use-Cases: NA

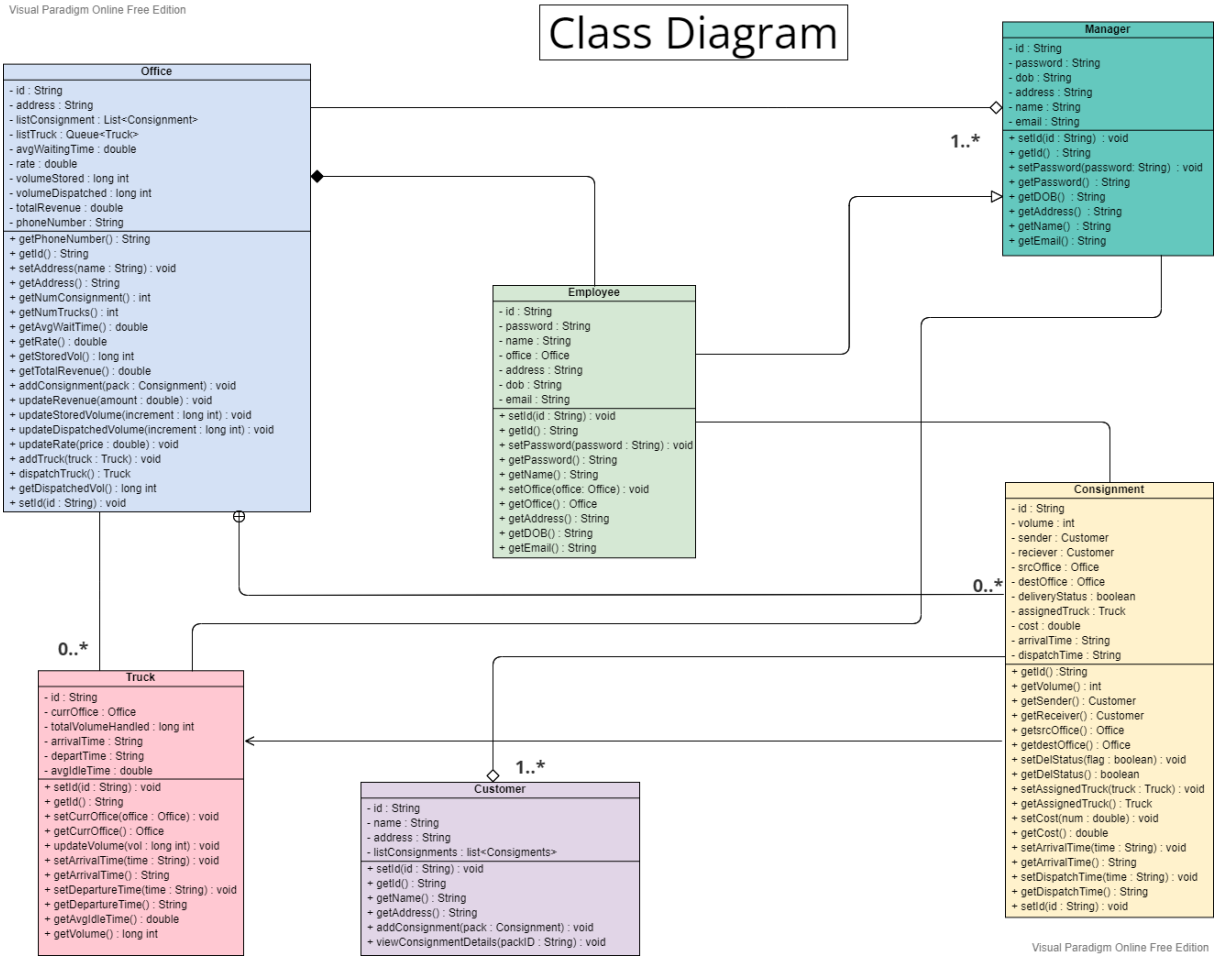
6.2.27 Use Case: View Branch Consignment Handling

Actor: Managers **type**: Primary
Description: Manager can view how the current consignments are being handled by any branch through a simple query
Includes: Query Volume Handled, Query Revenue Generated
Use-Cases: NA

6.2.28 Use Case: Enter UserID and DOB

Actor: Managers and Employees
type: Primary and Non-Essential
Description: Manager and Employees have the functionality to enter the UserID and DOB which they can use to change their password any time in the future
Includes: Update Database, Enter UserID, Enter DOB
Use-Cases: NA

7 Class Diagram



8 Data Structure

8.1 class Manager:

- id
- name
- address
- password
- email
- dob

8.2 class Employee extends Manager:

- id
- name
- address
- password
- email
- office
- dob

8.3 class Customer:

- id
- name
- address
- listConsignment

8.4 class Consignment:

- id
- volume
- sender
- receiver
- srcOffice
- destOffice
- deliveryStatus
- cost
- assignedTruck
- arrivalTime
- dispatchTime

8.5 class Truck:

- id
- currOffice
- totalVolumeHandled
- arrivalTime
- departTime
- avgIdleTime

8.6 class Office:

- id
- address
- phoneNumber
- listConsignment
- listTruck

- avgWaitingTime
- rate
- volumeStored
- volumeDispatched
- totalRevenue

9 Other Requirements

9.1 Appendix A: To Be Determined List

9.1.1 Future Plan

We would also try to include the latitude and longitude of our offices to determine the distance between them, and add them to the charge of delivery, to enhance the derivation of cost of delivery.

9.1.2 More...

The Functionalities of any good Software are updated with time and as such our Software of TransportX will update with time as we add more and more functionalities and we get new ideas to add to this, thus we will add to the SRS with time as we improve our software and add functionalities.