SOFTWARE REQUIREMENTS SPECIFICATION

for

TRANSPORTATION COMPANY COMPUTERIZATION SOFTWARE

Version 1.0 approved

Prepared by
Shivam Raj (20CS10056)
Kushaz Sehgal (20CS30030)
Hardik Pravin Soni (20CS30023)

Submitted On
September 18, 2024

Contents

Revision History

Name	Date	Reason For Changes	Version
TCCS	18/03/2022	-	1.0

1 Introduction

1.1 Purpose

The purpose of this document is to present a detailed description of the transport computerization system. It will explain the purpose and features of the software. It mentions the goals that are targeted for the software and the parameters leading to its development. It defines how the client, team and audience see the product and its functionality.

1.2 Document Conventions

- SRS: Software Requirement Specifications
- TCCS: Transportation Company Computerization Software
- GUI: Graphical User Interface
- Database: Data stored in an organized manner.
- Manager: Single person controlling entire operation of the company.
- Customer: Person giving order of consignment.

1.3 Intended Audience and Reading Suggestions

This document is intended for future developers, users and administrators of this system. For users, we recommend you jump to section 4 and find the section that's relevant to you. If you're setting up this system at a transport office, or want to know the technical requirements, check out sections 3, 2.4, 2.5 and 2.7 (not necessarily in that order). For future developers, we suggest you go through the entire document if you can, or at the very least, section 4 and the use-case and class figures

1.4 Project Scope

Primarily, the scope pertains to computerizing the book keeping activities of the transport company. It focuses on the company, the customers and applications which allow for the computerized control of the various ordered consignment transportation. In a nutshell, the software aims towards simplifying the handling and transportation of several orders received across different geographic locations.

1.5 References

The document has been prepared according to IEEE STD 830-1998 – Recommended Practices for Software Requirements Specifications.

2 Overall Description

2.1 Product Perspective

- This software is a replacement for existing systems of transport management in firms where the book keeping activities are handled very informally and do not follow a specific algorithm/method for efficient management.
- Our software will run as a centralized managing software providing the functionalities for manager, employees and customers of the firm.
- The application has a user-friendly GUI so that it can be used easily by its different users.
- The software is build keeping in mind the difficulty in handling the exponentially increasing number of products being bought and shipped throughout the globe.

2.2 Product Functions

This software will computerize the book keeping activities of a transport company. It maintains the details of various consignments received, allots trucks for their shipment efficiently, calculates cost of consignment delivery and issues bill for the consignment. It further provides multiple functionalities for its users.

1. Manager:
    - View status and usage of different trucks.
    - Query status of consignments and revenue.
2. Employees:
    - Dispatching and Receiving Truck
    - Validating consignment
3. Customers:
    - View consignment details.
    - Place Order
    - Track order and route details.

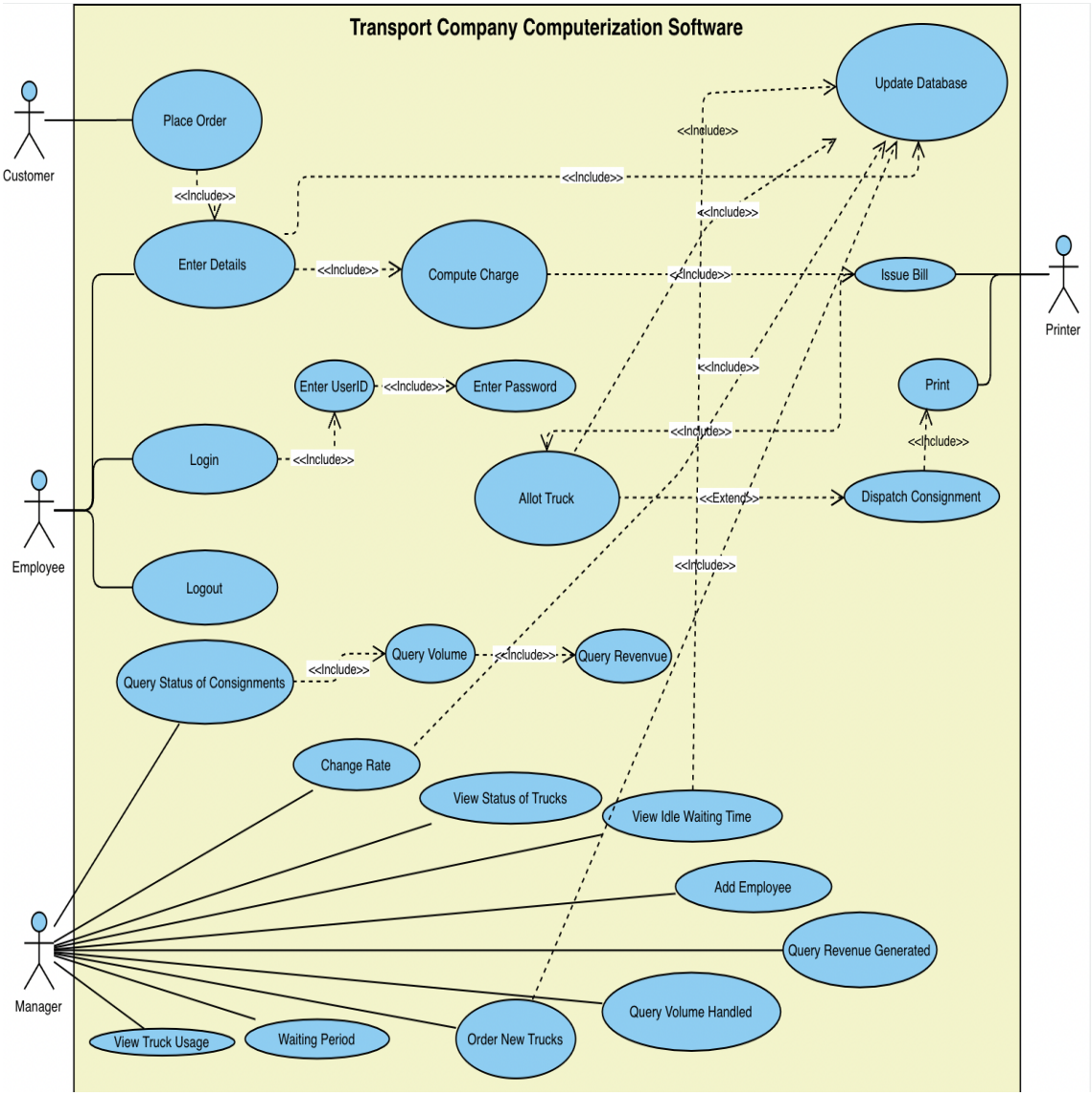
2.3 User Classes and Characteristics

The software aims to allow its users different functionalities on the basis of their requirements from the software. The various user classes of the software are:

- Manager
- Employee
- Customer

The different user classes mentioned above along with the functions they carry out are summarized in the use case diagram given below.

2.4 Use Case Diagram



2.5 Operating Environment

Hardware Requirements

- Windows XP or Higher, Linux, MacOS
- Keyboard or mouse for navigating UI

Software Requirements

- Python 3 or higher

- Django
- MySQL
- Python modules mentioned in requirements.txt file.

2.6 Design and Implementation Constraints

- The software cannot assure integrity of the data fed into the database.
- The application requires constant connection to the internet and thus cannot be used offline.
- It will also require SQL databases to be workable on the system.
- Handling a huge database will not be feasible for us, as it'll require a premium web server.
- The software doesn't provide feature for recovery of password in case the user forgets it.

2.7 User Documentation

To ensure smooth user experience we'll provide the following to different users of the software:

1. user manuals
2. online assistance
3. google form for reporting bugs

Above assistance is designed assuming no prior technical knowledge w.r.t the user.

2.8 Assumptions and Dependencies

The dependencies and assumptions affecting our software are enlisted below.

1. A very basic assumption is the familiarity of the user in handling such software, (though we try to make our interface as user friendly and interactive as possible).
2. Our software works assuming that whenever a truck is dispatched, the receiver receives the consignment.
3. For smooth functioning of the system on which we work with our software, along with proper coordination between the hardware and software interfaces, the system should have proper connection to the database to properly access the data and process it as and when required.

4. The software has module dependencies which is mentioned in requirements.txt file. Users have to install them through this file.

5. Constant connection to Internet for continuous transfer of data.

6. The volume entered in the database is accurate as dispatching of trucks depends on it.

3 External Interface Requirements

3.1 User Interfaces

Only mouse and keyboard are required for interacting with the software. The User interface designed is simple to interact with and has just sufficient features to ensure smooth experience.
When a user runs the software, they'll have three kinds of login available upfront:

1. Manager Login
2. Employee Login
3. Customer Login

A user will have to first signup in the database, entering the details mentioned in the UML diagram after which they can log-in into the system.
A user's login will be authorized after he/she enters correct credentials and will be given access to one of three interfaces:

3.1.1 Manager Interface

The manager will get the following options after logging in.

- View status of trucks.
- View statistics of consignments and trucks.
- Add an employee
- Add a truck.
- Change rate value.

3.1.2 Employee Interface

An employee gets the following options.

- Login and Logout
- Modify details such as name, address, mobile no.
- Entering Details of consignment

3.1.3 Customer Interface

A customer gets the following options.

- Modify details such as name, address, mobile no.
- Place order
- View status of order.

3.2 Hardware Interfaces

Hardware: Personal Computer or laptop

Operating System: Windows XP or higher, Linux

Internet Connection: Either LAN connection or Wi-Fi connection

3.3 Software Interfaces

Programming Language
Python 3.9.2 for designing both the front-end as well as the back-end. MySQL is used for querying databases.

Libraries and Tools
Django for web app and tools for integrating Python with MySQL.

Database Management
We use MySQL to manage the database. We maintain three tables to store details of manager, employees and customers.

Operating System
Works on all operating system.

3.4 Communications Interfaces

The database for the software is maintained using MySQL. To access this data, the software needs to communicate with MySQL. We'll be using MySQL connector in python for this purpose. MySQL Connectors provide connectivity to the MySQL server for client programs and APIs provide low-level access to the MySQL protocol and resources.

4 System Features

4.1 Updating Database

4.1.1 Description

Maintaining a Database which contains list of employees, the trucks and their availability and consignments shipped or ordered. Any new addition or change will also be reflected on the database. This feature is of utmost importance as the database will be required to implement any new functionality. Priority Level : High

4.1.2 Stimulus/Response Sequences

The database will be update under following scenarios:

- Customer orders a consignment to be delivered.
- A truck or employee is added to the company.
- A truck is dispatched for delivery.

4.1.3 Functional Requirements

REQ-1: Access to the software (login credentials)

4.2 Allotting Truck

4.2.1 Description

Region-Wise Truck Allotment on a first come first serve basis based on Volume to be delivered. A Truck will only be Allotted for delivery when total delivery volume exceeds 500 m3. Truck Allotment is based on greedily choosing truck with minimum number of deliveries.

4.2.2 Stimulus/Response Sequences

- Whenever a Customer orders a new Consignment, a check is to be made whether the total deliverable volume exceeds the required amount
- Truck Allotment will be done according to availability and previous consignments delivered.

- After Delivery, Database will be updated, signifying consignment has been dispatched.

4.2.3 Functional Requirements

- REQ-1: Access to the software (login credentials)
- REQ-2: Availability of Consignments and Trucks for Delivery.

4.3 Computing Delivery Cost

4.3.1 Description

This feature calculates the delivery costs based on the details of each consignment arrived at the office.

4.3.2 Stimulus/Response Sequences

1. A customer order a consignment.
2. The consignment arrives at the office of transport company.
3. The details of the consignment, i.e, volume, destination address, sender address, etc are entered in the database.
4. The cost of delivery is computed considering above factors along with location of the offices, availability of trucks and priority of delivery.

4.3.3 Functional Requirements

REQ-1: Access to the software (login credentials)

4.4 Dispatching Consignment

4.4.1 Description

This feature dispatches a truck when loaded enough to deliver a consignment.

4.4.2 Stimulus/Response Sequences

After a truck is allotted for delivery, an employee dispatches the consignment.

4.4.3 Functional Requirements

REQ-1: Access to the software (login credentials)

4.5 Issuing Bill

4.5.1 Description

This feature issues a bill for each consignment after the system computes the cost.

4.5.2 Stimulus/Response Sequences

1. Customer places order and enter the required details
2. Software computes the cost based on above details.
3. Then, a bill is issued for the customer's order

4.5.3 Functional Requirements

REQ-1: Access to the software (login credentials)

REQ-2: Correct details entered at both user and employee side.

4.6 Viewing Statistics

4.6.1 Description

This Feature enables a Manager to view additional details of consignments and trucks

4.6.2 Stimulus/Response Sequences

A Manager, after logging into the Database should be able to view the following details:

- The availability of each truck
- The entire history of consignment deliveries of each truck.
- The details of the consignment number, volume, sender's name and address, and the receiver's name and address to be forwarded along with the truck whenever a consignment is dispatched.
- The Details of any particular consignment and the details of volume of consignments handled to any particular destination and the corresponding revenue generated.
- The average waiting period for different consignments.
- The average idle time of the truck in the branch for a given period for future planning

4.6.3 Functional Requirements

REQ-1: Access to the software (login credentials)

REQ-2: Details of the Entity whose information is needs to be accessed.

5 Other Nonfunctional Requirements

5.1 Performance Requirements

- **Reliable**
  Statistics and Information retrieval from the database should be smooth, reliable and efficient for fast work-flow of business.
- **Efficient Management**
  Truck Allotment should be as efficient as possible to ensure proper usage of trucks and inventory and timely delivering of consignments.
- **Ease of Use**
  The Application Interface should be fast and easy to use, i.e , it should be user-friendly

5.2 Security Requirements

- Information Leak or corruption of data is an important issue for our system. To ensure Integrity of Data, It is imperative that we give access only to authorized members.This can be done through a login system of each member with a unique password.
- The database may store passwords in "serializable" file and there doesn't need to be a password recovery feature nor lockout after numerous invalid login attempts.
- As such, the system may not work correctly in cases when security is a concern.
- We are forcing users to have "strong password". A strong password is a password that meets a number of conditions that are set in place so that user's passwords cannot be easily guessed by an attacker.
- Generally, these rules include ensuring that the password contains a sufficient number of characters and contains not only lowercase letters but also capitals, numbers, and in some cases, symbols.

5.3 Software Quality Attributes

- **Dependability**
  The system should be dependable i.e. it should consistently work as required without failing so often that the manager cannot access the database.

- **Robustness**
  The Database should be robust, that is quick and efficient access along with Maintaining Integrity of data without any information leaks.

- **Operable on Light Devices**
  The Application should have minimal processing requirements, that is the application would be usable even in a old computer.

6 Other Requirements

Database Requirements The proper functioning of this software requires a reliable local server for hosting the database. The whole system fails, if the server is tampered with (with malicious intent). It is essential that the physical location of the server is at place with access only to authorized personnel.

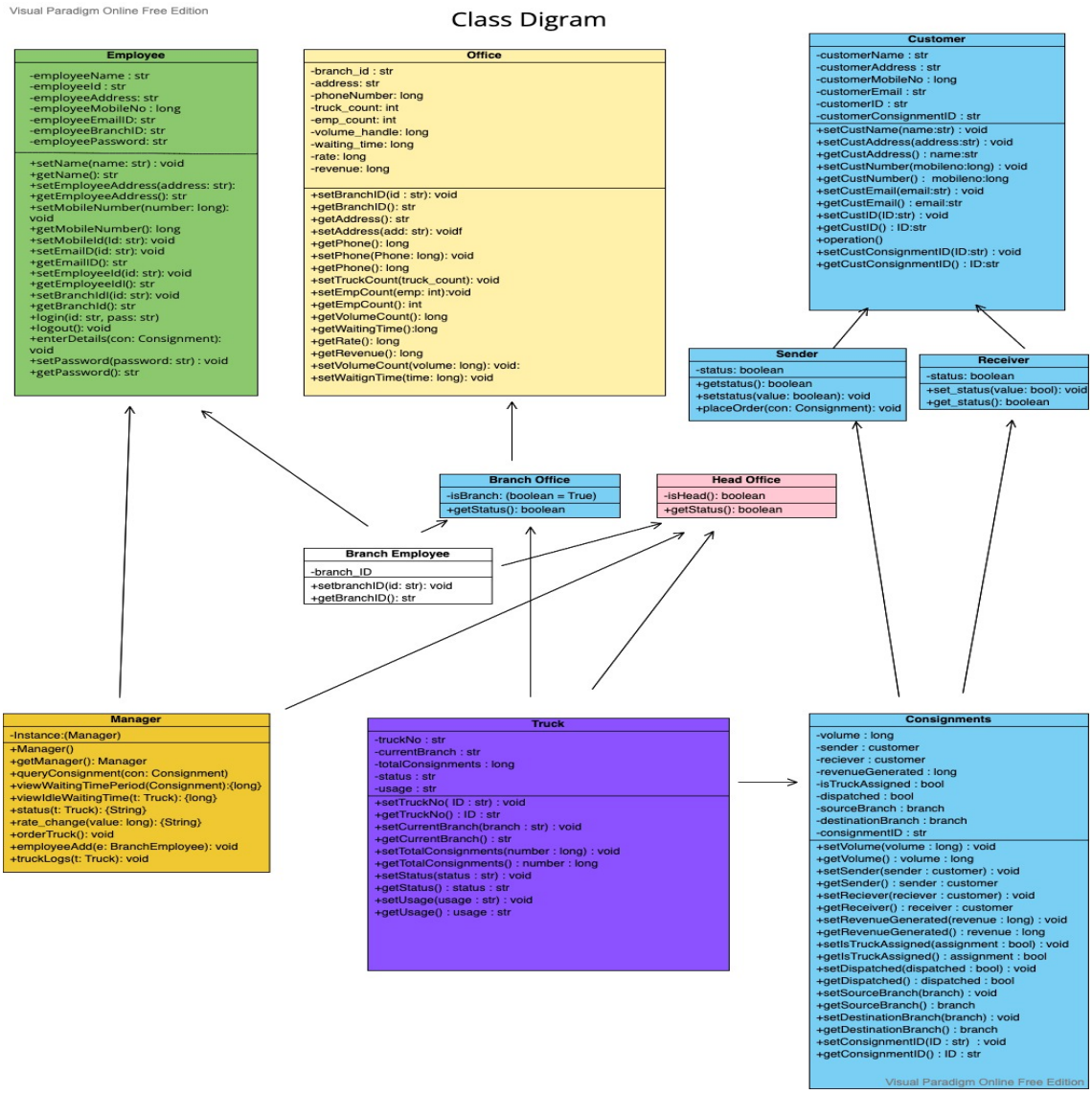
Manual Management Requirements Every consignment arriving at the office and dispatching from the office should be correctly updated in the database by the employees.

6.1 Appendix A: Glossary

TCCS	Transport Company Computerization Software
SRS	Software Requirement Specification
GUI	Graphical User Interface
Database	SQL database storing data
Manager	Person controlling entire operation of the company
Customer	Person giving oredr of consignment
Printer	Use case for printing enitities (bills, stats etc)

6.2 Appendix B: Analysis Models

6.2.1 UML Diagram



6.3 Appendix C: To Be Determined List

None