



**NATIONAL INSTITUTE OF TECHNOLOGY  
ROURKELA, ODISHA**

Transport Company Computerization  
**(TCC)**  
Software

Software Requirements Specification

Submitted By:

Santosh Prasad Yadav(122CS0968)  
Rajamahendrarapur Manju Preethi(122CS0568)  
Venkata Ramireddy Avula(122CS0328)

# 1. Introduction

## 1.1 Purpose

The primary objective of this System Requirements Specification document is to provide a comprehensive overview of the requirements, specifications, and features integral to the Transport Company Computerization (TCC) software. Designed to streamline the administrative processes of a Transport Company, this document serves as a detailed blueprint for both functional and non-functional requirements as outlined by the client. In addition to elucidating system constraints, it elucidates the software's interactions with external entities. This document seeks client approval, serving as a crucial reference for developers embarking on the development of version 1.0 of the application software.

## 1.2 Project Scope

The software aims to automate key processes within a Transport Company, enhancing administrative efficiency, speed, and overall sophistication. Deployment will occur across multiple branches, with the software serving as a centralized platform for managing consignments, trucks, and employee data. Its capabilities include truck allocation, calculating waiting times for consignments, and other functionalities designed to streamline operations. This document outlines the essential requirements that the software must fulfill to meet the objectives outlined.

## 1.3 Environmental Characteristics

The system will be a desktop application which will not require the use of the Internet. Developers can use the system irrespective of the underlying operating system. Furthermore, the system will be a standalone application and will not depend on any external hardware or software.

## 1.4 References

In the development of this SRS document, we have extensively referenced slides of our Software Engineering curriculum by **Prof. DP Mahapatro**.

## 1.5 Definitions

<u>Terms</u>	<u>Definitions</u>
Cataloging	The process of storing records of some kind in some storage base for reusability
Database	Organized collection of data
Developer	The person who makes software
ERD	Entity-Relationship Diagrams
GUI	Graphical User Interface
Software component	A standalone part of a software. It can include lines of code, functions, interfaces etc.
Software design	A design of the software. The designs can be of any kind including ER Diagrams, UML Diagrams, UI Designs, etc.
SRS	Software Requirements Specification
Stakeholder	Any person who has an interest in the project but is not a developer
UML	Unified Modeling Language

## 1.6 Developer's Responsibilities

1. To understand the requirements of the system from the users' perspective outlined in the second section.
2. To understand the requirements of the system technically in detail specified in the third section.
3. To learn the required tech stack outlined in the SRS within a week.
4. To configure the developers' system environments to facilitate the development of the system and cater to the constraints of the users.
5. To maintain timely testing and maintenance of the system after the development phase.

## **2. General Description**

### **2.1 Product Perspective**

The system specified in the SRS document will be a new software. It will be a standalone desktop application and will not be developed as part of another software or as complementary software to bigger software.

### **2.2 Product Functions Overview**

This software will help to make the management and administrative processes of a Transport

company faster and efficient. The functionalities of the software are as follows:

1. The software will be able to store the details of consignment, compute the transport charge and issue bill for the consignment.
2. It will be able to automatically allot the next available truck as the consignment for a particular destination exceeds a certain limit.
3. It will be able to store the truck details and show the status of trucks as well as consignments in a given time.
4. It will be able to compute the average waiting time for consignments and the idle time of a truck.
5. Passwords and user ID will be used to protect the accounts of employees and manager.

### **2.3 Operating Environment**

This software will be designed to work flawlessly without any issues on Ubuntu or Windows, having a compiler to code and a database to store the data.

### **2.4 General Constraints**

The software will run properly on a computer having support for programming and the database to be used. The computer should have a minimum of 2GB RAM (preferably 4GB or more) and 20GB free space (preferably 50GB or more). More memory may be required if the database is too large.

## 3. Functional Requirements

### 3.1 Truck Allocation Function

**a. Introduction** - The Truck Allocation function is responsible for automatically assigning trucks to consignments based on predefined criteria, ensuring efficient utilization of resources.

**b. Inputs:**

1. Consignment ID: A unique identifier for the consignment.
2. Consignment Volume: The volume of the consignment in cubic meters.
3. Destination: The destination addresses of the consignment.
4. Current Truck Status: The availability and status of trucks.

**c. Processing**

1. Check if the consignment volume has reached the threshold for truck allocation (e.g., 500 cubic meters).
2. Verify the availability and status of trucks.
3. If the conditions are met, automatically assign the next available truck to the consignment.

**d. Outputs**

1. Truck ID: The identifier of the assigned truck.
2. Confirmation Message: Notification indicating the successful allocation of the truck.

## 3.2 Consignment Billing Function

The Consignment Billing function is responsible for generating bills for consignments based on their volume and destination, providing accurate financial records for the transport company.

### **Inputs**

1. Consignment ID: A unique identifier for the consignment.
2. Consignment Volume: The volume of the consignment in cubic meters.
3. Destination: The destination addresses of the consignment.
4. Transport Charges: Calculated charges based on volume and destination.

### **Processing**

1. Retrieve consignment details and calculate transport charges.
2. Generate a bill with itemized charges for the consignment.

### **Outputs**

1. Bill ID: A unique identifier for the generated bill.
2. Bill Details: Itemized charges, consignment details, and total amount.

### 3.3 Truck Status Tracking Function

#### **Introduction**

The Truck Status Tracking function allows the manager to monitor the real-time status of different trucks within the transport company.

#### **Inputs**

1. Truck ID: The unique identifier of the truck.

#### **Processing**

1. Retrieve and display the current status of the specified truck.

#### **Outputs**

1. Truck Status: Information on whether the truck is available, in transit, or idle.

These functional requirements provide a detailed breakdown of the introduction, inputs, processing, and outputs for each defined function in the transport management system.

## **4. Non-functional Requirements**

### 4.1 Performance

- The system shall process **truck allocation requests** within **3 seconds** after consignment details are submitted.
- Database queries for **truck status tracking** shall return results in under **2 seconds**.

## 4.2 Scalability

- The database shall support up to **10,000 consignments** and **500 trucks** without performance degradation.
- The system architecture shall allow **horizontal scaling** for future expansion.

## 4.3 Reliability

- The system shall maintain **99.5% uptime** during operational hours.
- Critical failures shall trigger **automatic backups** and recovery within 15 minutes.



## **5. External Interface Requirements**

### **5.1 User Interfaces**

The system will be able to provide appropriate information messages for software functionalities as well as error messages for exceptional cases.

### **5.2 Software Interfaces**

The system will be able to support multiple languages to cater to different kinds of software components as well as store different designs and diagrams.

## **6. Design Constraints**

### **6.1 Hardware Limitations**

The system will be developed as per the following specifications:

Windows 10 Professional

256 GB SSD

Intel Core i5

8 GB RAM

### **6.2 Technical Limitations**

The system will be developed in JavaScript using the Electron framework. MySQL will be used as the main database.

## 1. Design Constraints

- **Truck Capacity:** Trucks can only carry consignments up to their fixed capacity.
- **Branch Space:** Branches must have space to store consignments.
- **Cargo Dispatch:** Trucks are dispatched only when their load reaches 500 cubic meters.
- **Cost Calculation:** Transport charges depend on consignment volume and destination.
- **Manager Access:** Only managers can view and modify truck and consignment data.
- **Data Storage:** Consignment details (volume, sender, receiver, charges) must be tracked and stored.
- **Waiting Period:** The system must track and calculate consignment waiting times.
- **Idle Time:** The system must track truck idle times and calculate averages for planning.

## 2. Data Dictionary

### 2.1 Truck Table

Field name	Datatype	Description
Truck_ID	Integer(Primary Key)	Unique identifier for each truck.
Truck_status	string	Current status of the truck
Truck_Load_Capacity	Integer	Maximum load capacity of a truck in cubic meters.
Truck_Age	Integer	Age of the truck in years.

### 2.2 Consignment Table

Field Name	Data Type	Description
Consignment_ID	Integer(Primary key)	Unique identifier for each consignment.
Consignment_Volume	Integer	Volume of the consignment in cubic meters.
Sender_Name	String	Name of the sender of the consignment.
Sender_Address	String	Address of the sender.
Receiver_Name	String	Name of the receiver of the consignment.
Receiver_Address	String	Address of the receiver.
Dispatch_Status	String	Status of the consignment (e.g., Waiting, Dispatched, Delivered).
Dispatch_Date	Date	Date when the consignment was dispatched.

Arrival_Date	Date	Date when the consignment arrived at the destination.
Revenue_Generated	Float	Revenue earned from handling the consignment.

### 2.3 Branch Table:

Field Name	Datatype	Description
Branch_ID	String	Unique identifier for each branch.
Branch_Location	String	Address or location of the branch.

### 2.4 Consignment Tracking Table:

Field Name	Data Type	Description
Tracking_ID	Integer (PK)	Unique identifier for each tracking record.
Consignment_ID	Integer (FK)	Consignment being tracked.
Truck_ID	Integer (FK)	Truck assigned to transport the consignment.
Branch_ID (starting)	Integer (FK)	Branch where the consignment was received.
Branc_ID_destination	Integer (FK)	Destination Branch

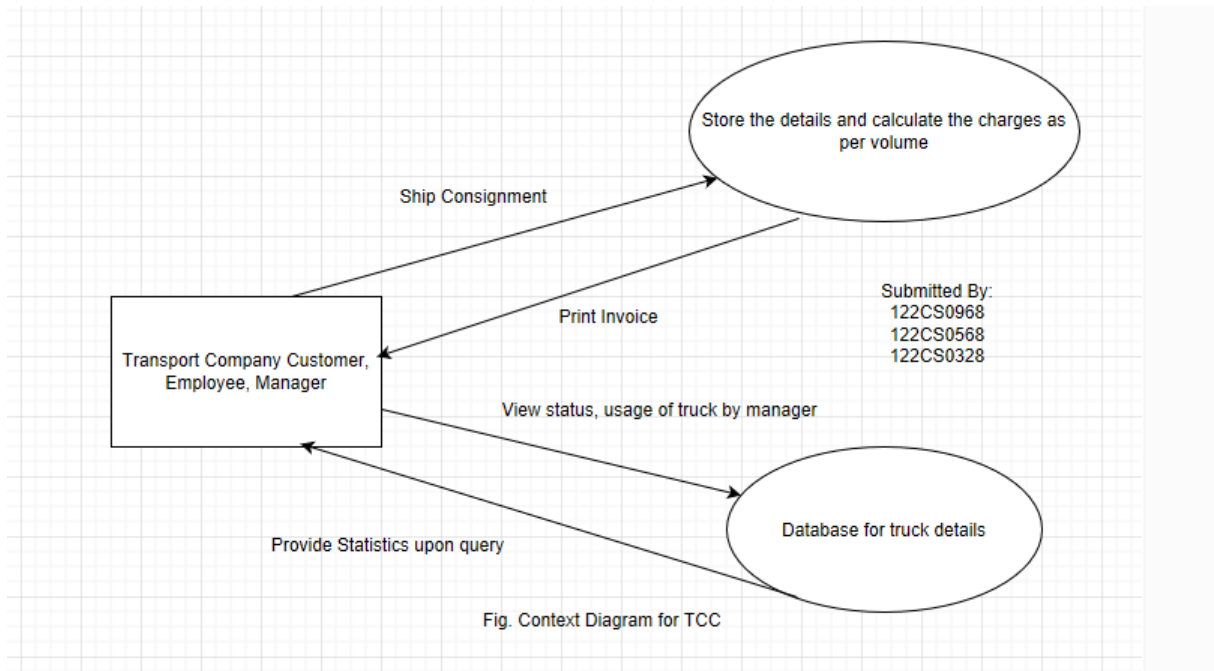
## 2.5 Truck Waiting Table:

Field Name	Data Type	Description
Waiting_ID	Integer (PK)	Unique identifier for the waiting record.
Truck_ID	Integer (FK)	Truck waiting at the branch.
Branch_ID	Integer (FK)	Branch where the truck is waiting.
Waiting_Time	Integer	Time (in days) a truck waits before being assigned a consignment.
Average_Waiting_Period	Float	Average waiting time for consignments at a branch.

## 3. Data Flow Diagram

### 3.1 Level 0 DFD(Context Diagram)

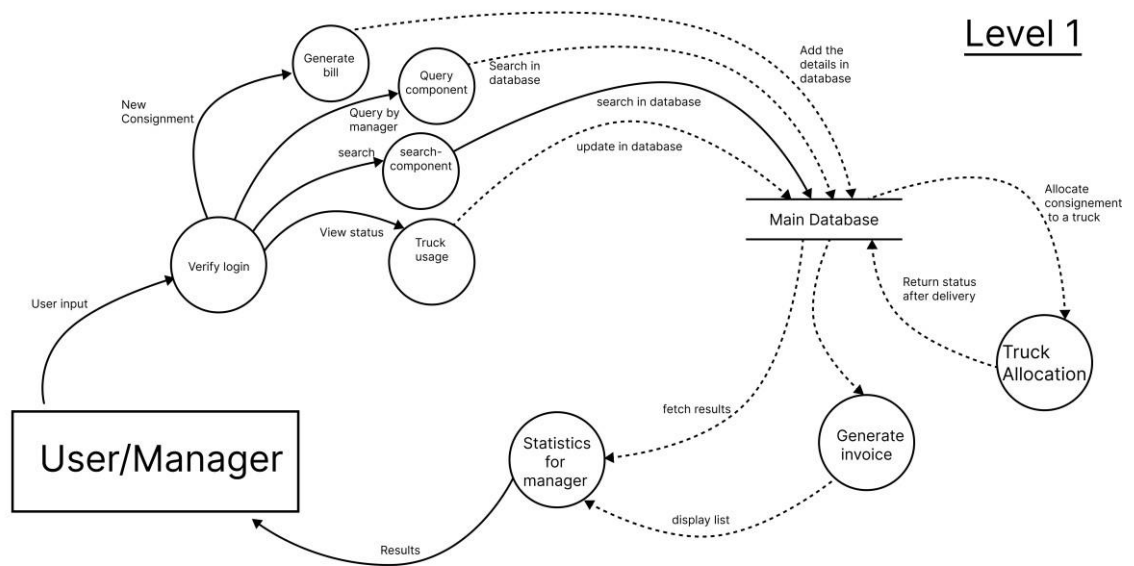
- In the context diagram, employees and customers can request the status of consignments, while the manager can request detailed reports such as truck usage, revenue, and waiting times.



### 3.2 Level 1 DFD

- **Consignment Details:** Entered by branch offices and stored in the system.
- **Truck Assignment Info:** Sent to the transport system when the truck is allocated to a consignment.
- **Consignment Status:** Provided to the manager for tracking the consignment.
- **Truck Usage/Revenue Reports:** Sent to the manager when requested for analysis.
- **Average Waiting Time & Idle Time:** Sent to the manager for future planning decisions.

# Transport Company Computerization Software Data flow diagram



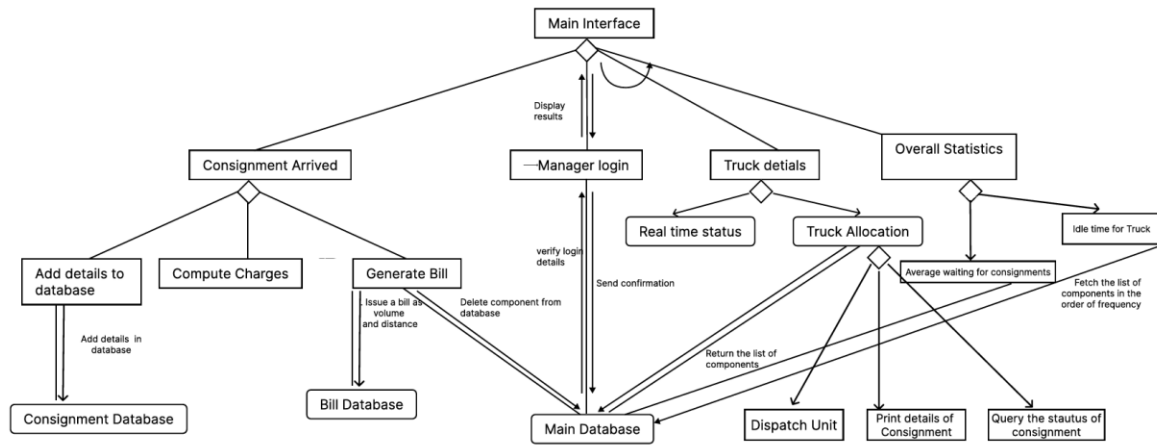
Symbols used:

Entity- defines source or destination of the system

Processing box-represents as a process

Arrow identifies the data flow

# Structure Chart



Conditional Call



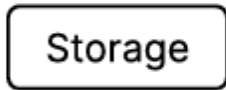
Loop (Repetitive call of module)



Data Flow



Control Flow

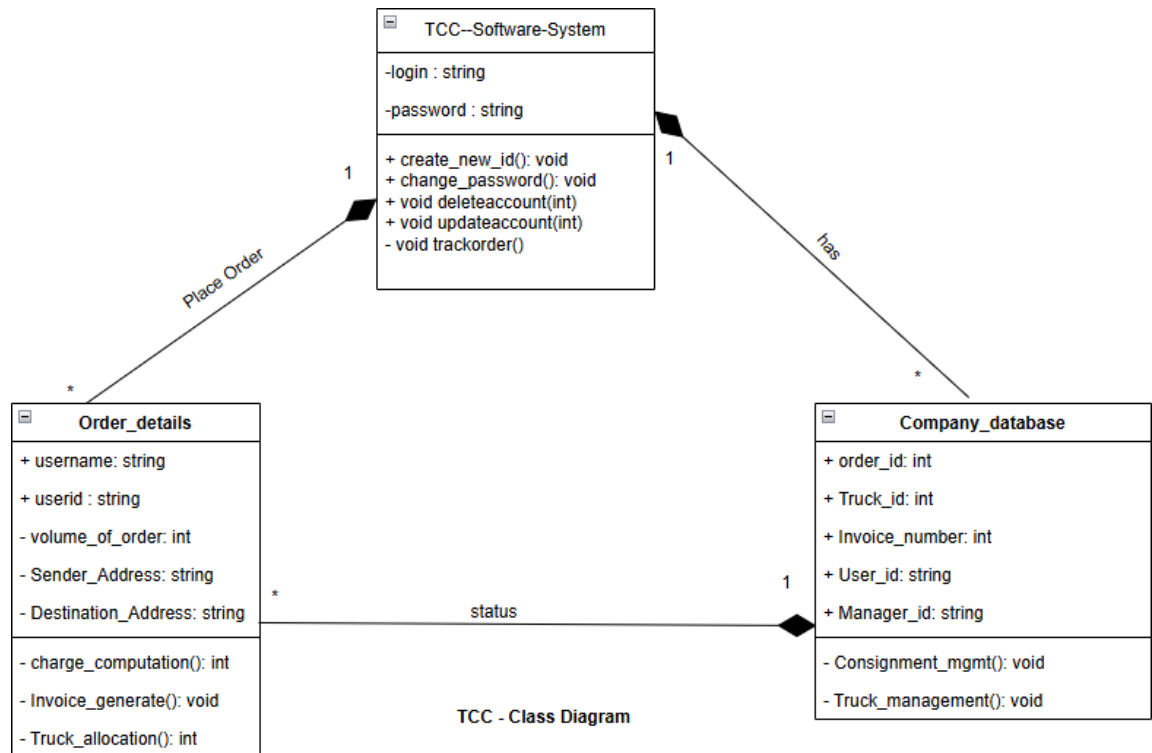


Storage

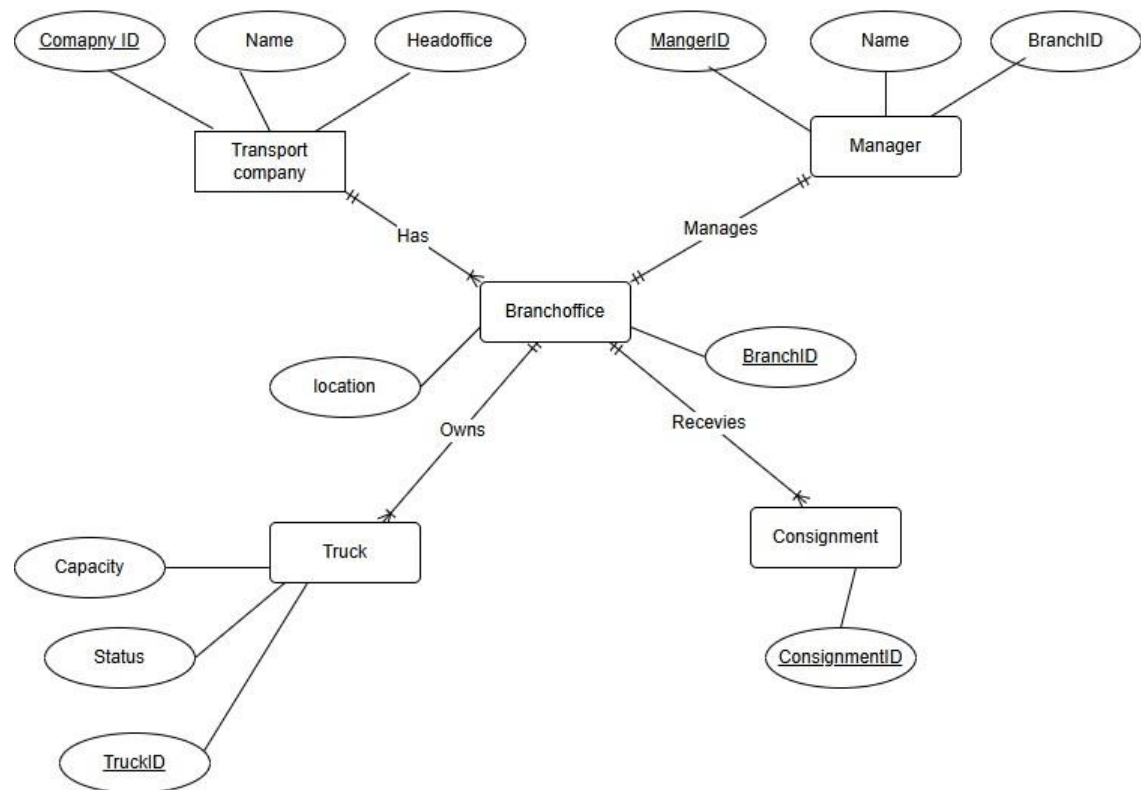
Physical Storage



# 1. Class Diagram



## 1. ER Diagram



## 2. Activity Diagram

