

Transport Company Computerization Software Software Analysis & Software Design (SA/SD)

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1.0 Introduction

The introduction of the software requirement specification (SRS) provides an overview of the entire SRS which follows. The sub-sections in introduction are purpose, scope, definitions, acronyms, abbreviations, references and overview of the SRS. The aim of this document is to gather and analyze and give in-depth insight of transport company computerization software by defining the problem statement in detail. Not only has that it also concentrated on the capabilities that the managers of the company must possess in order to achieve new heights of success. The detailed requirements of this software are provided in this document.

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 in the best possible way. While developing the SRS document we as developers have taken utmost care to make it precise, unambiguous, consistent and understandable to the best of our knowledge. The document will also help us to predict and sort out how to use the product in a better way. It will also promote better understanding of the project, outline the important concepts that may be developed later, and document the core ideas that are being considered in the development process, but nonetheless these ideas may be discarded as the product develops in due course of time.

In a nut-shell, the purpose of this SRS document is to provide a detailed overview of our software product, the goals that are targeted and the parameters which lead to its development. The SRS document also describes the project's target audience and its user interface, hardware and software requirements. It defines how the client, team and audience see the product and its functionality. Last but not the least, it helps any designer and developer and developer to assist in software delivery lifecycle (SDLC) processes.

1.2 Scope

Primarily, the scope pertains to the 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. This SRS is also aimed at specifying requirements of software to be developed but it can also be applied to assist in the selection of in-house and commercial software products. The standard can be used to create software requirements specifications directly or can be used as a model for defining an organization or project specific standard. It does not identify any specific method, nomenclature or tool for preparing an SRS.

1.3 Overview

The remaining sections of this document provide a general description, including characteristics of the users of this project, the product's hardware, and the functional and data requirements of the product. General description of the project is discussed in section 2 of this document. Section 3 gives the functional requirements, data requirements and constraints and assumptions made while designing the E-Store. It also gives the user viewpoint of product. Section 3 also gives the specific requirements of the product. Section 3 also discusses the external interface requirements and gives detailed description of functional requirements. Section 4 is for supporting information.

1.4. Environmental Characteristics

1.4.1. Hardware

The software requires a pc either running on windows or Linux and should have java IDE installed. There are no hardware or software requirements beyond these including, but not limited to, memory or specific software packages that need to be utilized nor software packages that need not be utilized.

1.4.2. People

This software can be used by any user having basic skills in operating a computer since the user interface is very simple.

2.0 Feasibility Study

2.1 Problem and its scope

This software computerizes the transportation of consignments. It automatically allots trucks to be sent to various branches and compute charges and generates revenue based on the distance and volume of the consignment.

2.2. Stakeholders

The stakeholders are:

1) Manager:

- a) He can add new employee
- b) He can order new trucks
- c) He can view status of any truck at any point of time
- d) He can view the average waiting time of any consignment
- e) He can view the volume of any consignment sent to any particular destination.
- f) He can view the idle time of any truck.

2) Employee:

- a) He will enter the details of any consignment as soon as the consignment arrives the office.

2.3 Alternatives

Technology used

In this software, we are using JAVA IDE for coding and MySQL to store the Databases. We can also use C / C++ coding language and other database systems as SQL server, Oracle, Sybase, Access, etc.

2.3.2. Hardware infrastructure

This software is designed to run on Linux and Windows operating systems. It can also be designed to run compatibly with MAC OS systems.

We are currently using internal memory of system. We can also use external hard-disk of any size for its implementation. Currently TCCS is designed to run on 64 bit machine, it can be alternatively designed to run on 32 bit machines.

2.3.3. Security

The TCCS can be designed for various levels of security for different supervisors. Instead of using password protection for login into the system, we can also incorporate Face recognition, a Bar Code scanning system, or a thumb impression recognition system for login of the important stakeholders.

2.4. Criteria to evaluate

The primary criteria which are to be kept in mind while evaluating the alternatives are:

- 1) Cost of technology
- 2) Cost of infrastructure
- 3) Lifetime of technology
- 4) Stability of technology

2.5. Assessment of Unusual circumstances

The software should take care of the fact that the data is not lost in any case. The design should take care of the fact that the data is not lost in any case, be it software or a hardware failure, system going down or any unusual circumstances that might intervene in between the smooth

functioning of the TCCS. For this, we can design a MASTER system which stores the backup of all the data which is fed into the TCCS time to time. This master system would allow us to retrieve data at any point of time and restore the database to its original state.

2.6. Evaluation of alternatives

2.6.1 Technology used

Since we do not deal with algorithm intensive techniques in TCCS, we need not go for programming languages like C++ and Java would suffice.

2.6.2. Hardware infrastructure

using an external hard disk to save the database will indirectly imply a backup of the database along with the master system which can be retrieve the data at any point of time desired. Thus, this is better than using the system hard disk to store the data. This also ensures that the software does not any space on the system hard disk. The TCCS can be designed for a 32-bit system as well as a 64-bit system. Designing the TCCS for a 64-bit system should be preferred for the graphical interface concerns.

2.6.3. Security

If the TCCS uses security systems like thumb impression recognition, the cost of technology increases but the security increases. As the cost of production is a major concern for the TCCS design, the security alternatives should be given the least priority. Also, the TCCS is less prone to hacking and security threats.

2.7. Report

In the feasibility study, we went through the complete details of the problem. The objectives of TCCS have been laid out and the various scopes have been discussed in detail. Firstly we understood the complete problem and found various

functions that the TCCS performs. We discussed rights of Manager of the transport company and job of branch employees. Various alternatives were developed keeping in mind the cost and the lifetime of the components the alternative brings with it and hence the advantages and disadvantages were highlighted. These alternatives included the hardware, software, security and technical aspects which form integral part of the software and which could be incorporated in the TCCS if desired. The primary criteria for evaluation were expected lifetime, cost, stability, and instability of the technology. The unusual circumstances like loss of data due to hardware or software failure or hacking were taken care of by certain concepts of data backup, cryptography etc. At last, all the alternatives proposed earlier were analyzed in depth and their advantages and boon to the TCCS were clearly mentioned. A very vivid comparison was made between the TCCS development without the alternatives and with the alternatives if incorporated in the software.

3.0 Requirement Specification

3.1. External Interface Requirements

3.1.1. User Interfaces

Only mouse and keyboard are required for interacting with system.

3.1.2. Hardware Interfaces

Hardware: Personal Computer

Operation System: Windows XP or more, Linux

Internet Connection: Either LAN connection or Wi-Fi connection

3.1.3. Software Interfaces

The software will be coded in JAVA IDE using Eclipse or NetBeans. No other software interface required.

3.2. Functional Requirements

Functional Requirements are those that refer to the functionality of the system, i.e. what services it will provide to the user. Nonfunctional requirements pertain to the other information needed to produce the correct system and are detailed separately.

The set of functionalities that are supported by the system are documented below-

3.2.1 Compute Charge

Input: The employee of a branch enter the details of the consignment as soon as the consignment arrives the office.

Output: The Software computes the charge depending on the sender's address, destination and volume of the consignment.

3.2.2 Allot truck

Input: As soon as the computer computes the charge for the transportation of the consignment and issue a bill.

Output: Automatically it allots the available truck. If the volume of any consignment crosses 500 cubic m. automatically it allots the next available truck.

3.2.3 Issue bill

Input: The software computes the charge of the consignment.

Output: The software issues a bill of the charge.

3.2.3 Dispatch Consignment

Input: The software allots the truck for a consignment to be dispatched.

Output: The software prints the bill for the consignment.

3.2.4 Forward Acknowledgement

Input: The truck is dispatched for the consignment to be sent.

Output: The branch office is acknowledged as soon as the consignment arrives the office.

3.2.5 Add Employee

Description:

Manager can add employees to the database and can assign employee to any branch.

3.2.6 Print Details

Description:

As soon as the truck is dispatched, the system prints the bill of delivery already generated.

3.2.7 Query Status

Description:

Manager can view the average waiting period of any consignment, average idle time of any truck.

3.2.8 Update Database

Description:

When manager adds an employee it updates the employee database table, when a truck is dispatched, the truck database table is updated.

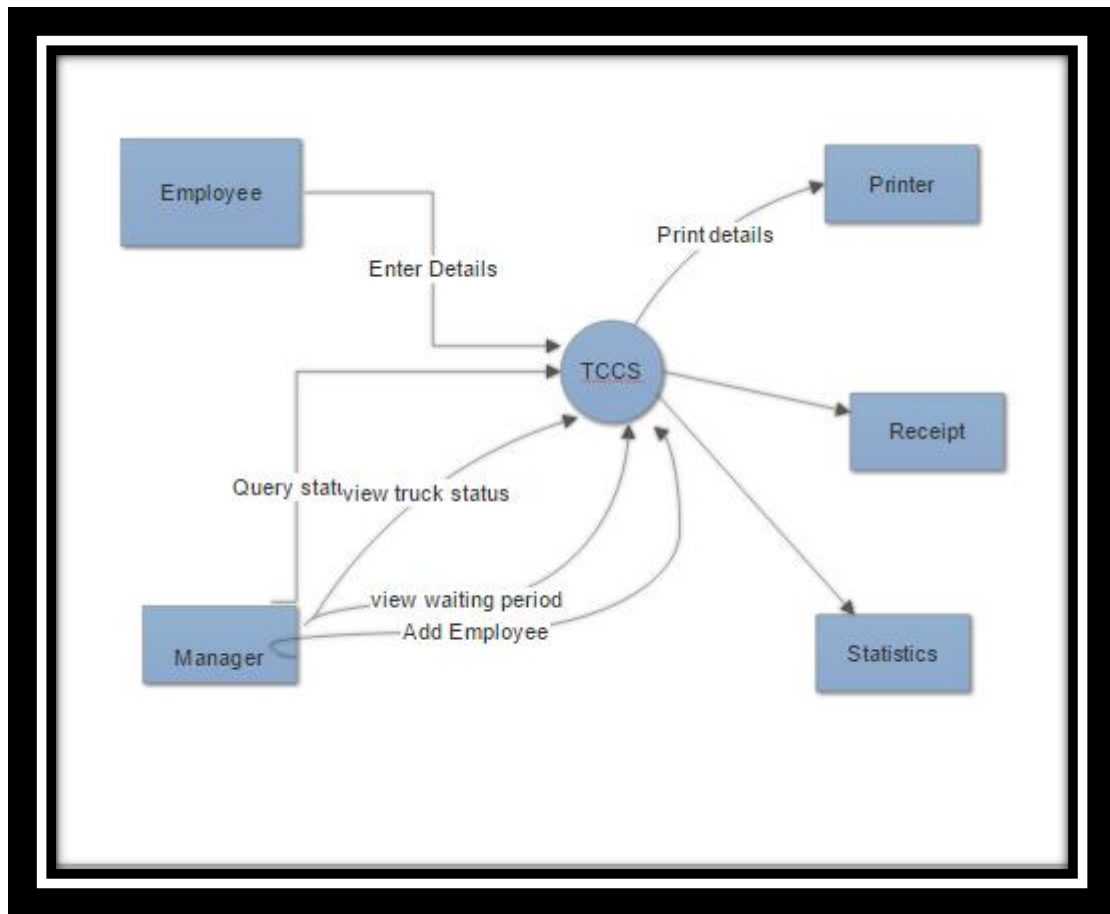
3.2.9 Print details

Description:

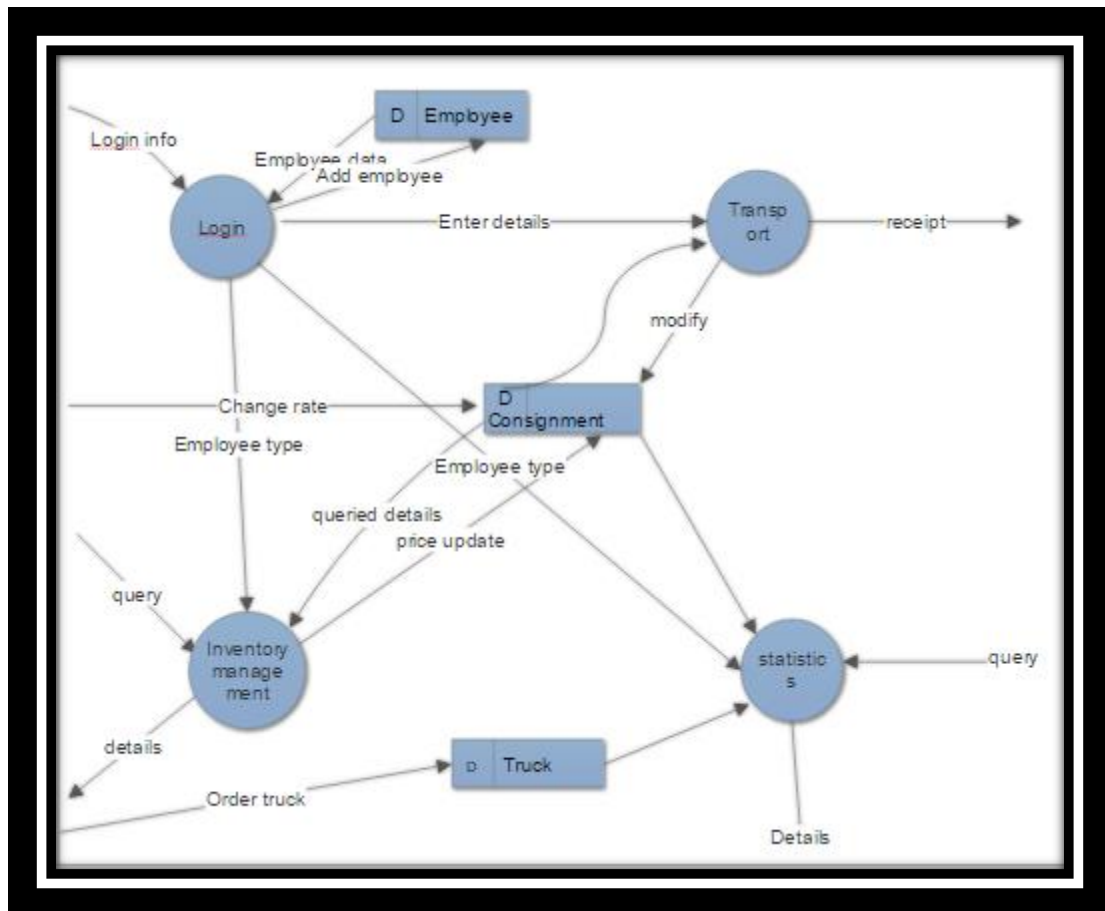
When a truck is dispatched, the software prints the bill generated for the consignment.

4.0 Data Flow Diagram

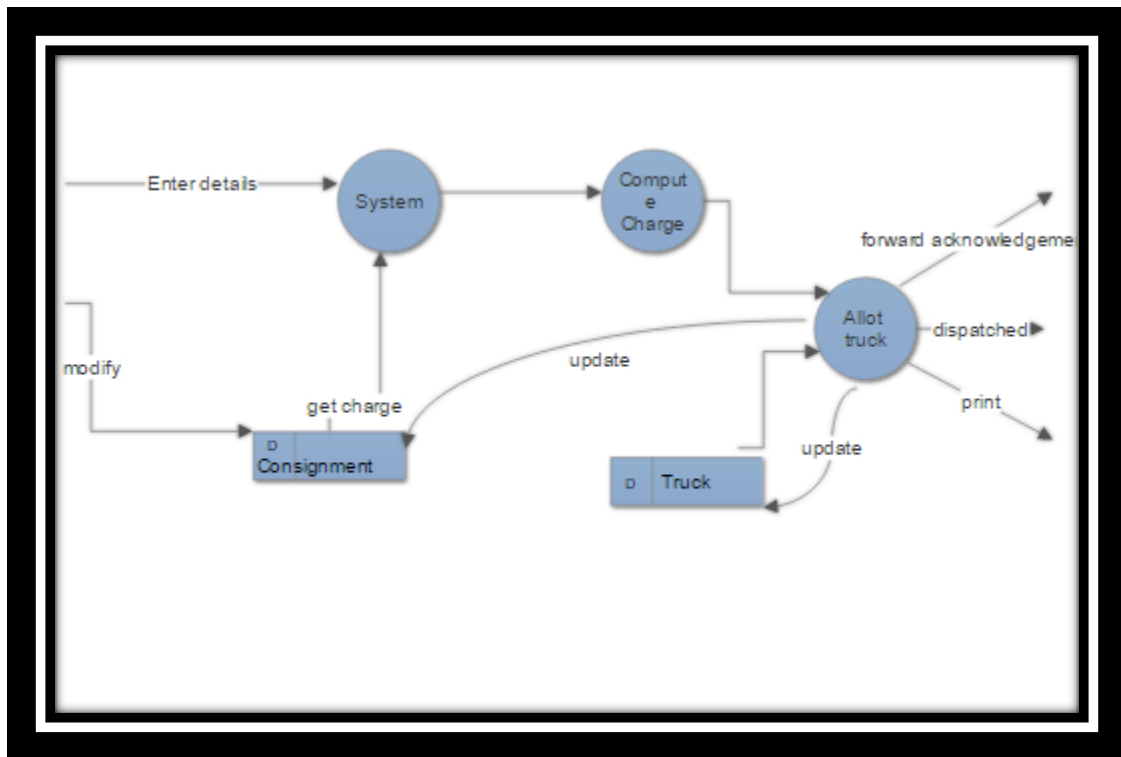
4.0.1 Context Diagram



4.0.2 Data Flow Diagram – level 1



4.0.2 Data Flow Diagram – level 2



5.0 Data Structure

5.1 Employee has following attributes:

1. ID
2. Name
3. Address
4. Password
5. Mobile No.
6. Email Id

5.2 Consignment has following attributes:

1. Volume
2. Sender
3. Receiver
4. SourceBranch
5. Destination Branch

6. IStruckAssigned

5.3 Customer has following attributes:

1. Name
2. Address
3. EmailId
4. CustomerId
5. MobileNo.

5.4 Truck has following attributes:

1. TruckNo.
2. CurrentBranch
3. NumberOfConsignmentsHandled
4. Status
5. Usage

6.0 Detailed Non-functional Requirements

The set of non-functional requirements can be stated as follows:

6.0.1 Bill Format

- 1.) The Bill should contain 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.

6.0.2. Sales-statistics Report Format

- 1) The sales statistics report should indicate the quantity of an item sold, the price realized, and the profit.

6.0.3. Data must be saved properly

6.0.4. Correct data must be given

6.0.5. The software should be protected from customers and non-employees of the Company.

3.6. Report

In the requirements analysis section, we started with the functional requirements of the TCCS and explained them in detail using data flow diagrams, Structure chart and data dictionary. The data flow diagrams graphically represent the “flow” of data through the information system, modeling the process aspects of the TCCS. They are a preliminary step to create an overview of the TCCS. Thus the DFDs along with the structure chart and the data dictionary have been used for the visualization of data processing in the TCCS, i.e. the structural design of the software being developed. The second part of the requirements analysis deals with the non-functional requirements of the TCCS. These include the database requirements, the legal requirements, and the availability of the TCCS over a day and the physical security of the software being developed. The various non-functional requirements ensure the delivery of an operable and manageable system which provides the required functionality in a reliable fashion, uninterrupted and with minimal time of interruption even under the unusual circumstances.

5.0 Detailed Design

5.1 Global System Architecture

The overall system architecture is a 2-tier architecture which includes client at one end and the database at the other. There is no server based middle tier in the software being designed.

5.2 Platform

Minimum system requirements:

Hardware Requirements:

Operating system	Windows XP/98 or later versions, Linux
Processor	Pentium II processor or equivalent

4.3. Software Architecture

Object-oriented architecture forms the basis of the TCCS.

In this style data representations and their associated primitive operations are encapsulated in an abstract data type or object. The components of this style are the objects—or instances of the abstract data types. Objects interact through function and procedure invocations. Two important aspects of this style are (a) that an object is responsible for preserving the integrity of its representation (usually by maintaining some invariant over it), and

(b) That the representation is hidden from other objects. Thus the aspects of OOA mentioned justify our choice.