Software Requirements Specification

TOLL BOOTH MANAGEMENT SYSTEM

Version 1.0

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Introduction

1.1 Document Purpose

The product whose software requirements are specified in this document is Toll Booth Organization**.**
The purpose of this document is to present a detailed description of the product, Toll Booth Organization systems . This document is intended to

- Explain the purpose and features of the product, Toll Booth Organization systems
- The constraints under which the product must operate
- How the product would respond to different users' requests.

The document's primary goal is to help the reader get a better understanding of the project.
The document is intended for the developers of the software, the end users of the product who have been identified in the later sections, and to the professors who would review the project.

1.2 Product Scope

The software being developed is a web based Toll Booth Management System. The product would simplify the whole process of Toll system and make it much faster and less congesting:

- The System issues a unique code for each vehicle registered under it.
- Allocate each car a unique code which helps in easy payment in toll.
- Providing different views of the software depending on different roles.
- Implements many functionality to the toll employee to note the amount of money collected and number of vehicles that have traveled through that toll.

The points mentioned above would greatly simplify the work of the toll and would let the drivers a much more comfortable ride. The software will be designed to maximize productivity by providing tools to assist in automating the process as much as possible. The software also helps in lessening the congestion and make it a

smoother ride through each toll. This also takes care of people who haven't paid for the toll booth.

1.3 Intended Audience and Document Overview

1.3.1 Intended Audience:

This document is primarily intended for the:

- Developers of this software
- Software engineers who would work on further development of the project
- The professors who would review the document and finally,
- All vehicle drivers and Toll Managers across the country.

1.3.2 Document Overview:

The first chapter, that is the Introduction section of the document is intended to introduce the reader to the product, Toll Booth Organization systems**.**

The second chapter, Overall Description section of SRS v1.0 document provides an overview of the overall functionality of the product. It describes the informal requirements.

The third chapter, Specific Requirements section, of SRS v1.0 document is written primarily for the developers and describes in technical terms the details of the functionality of the product.

The second and the third chapter of the document describe the same software product, but are intended for different audiences and thus use different languages.

1.4 Definitions, Acronyms and Abbreviations

1	Employer	Employer is the one working in the toll booth.
2	Toll Manager	Toll Manager is an individual who is responsible for the toll in the respective place and has the ability to overlook the software from anywhere. He/She is usually the lead of the toll.
3	HTTPS	HTTPS stands for Hypertext Transfer Protocol Secure. This protocol is a widely used communications protocol for secure communication over a computer network, with especially wide deployment on the Internet.
4	SRS	SRS stands for Software Requirement Specification. It is a document that completely describes all of the functions of a proposed system and the constraints under which it must operate.
5	Team Head	Team head is an individual who is responsible for all the actions undergoing under his/her team.
6	UI	UI stands for User Interface. It is defined as the space where interaction between humans and machines occurs.

1.5 Document Conventions

Formatting Conventions:

- The font style for the headings of each section is Arial Bold and the font size is 18.
- The font style for the headings under each section is Arial Bold and the font size used is 15.
- For the remainder of the document, the font style is Arial and the font size is maintained at 12.
- Italics have been used to indicate comments.
- The text is single spaced and margins are maintained at 1'' separation.

2. Overall Description

2.1 Product Perspective

The proposed software,Toll Booth Organization systems is a new self contained product. The software, Event4u will gather information about various arrangements that are needed to be done to conduct any event by the client. The software will empower the user, be it a professional or a non professional person to efficiently manage any event at hand. The software,Event4u, is intended to define a development methodology for the user, beginning with the requirements phase and continuing through to the execution phase.
Every user who wants to use the software,Event4u will have a login to facilitate security and privacy. A simple UI will aid the user in easily navigating through pages and focussing on the task at hand.

There will be 4 views of the overall event:

- Event Manager
- Volunteer
- Team head
- Employer

The software, Event4u will implement the following functionalities :

- Tracking of the expenditure.
- Allocate teams, volunteer.
- Allocate tasks.
- Track the details and developments made by all teams.

An important attribute of Event4u is its independence from the kind of Operating System that the computer on which it runs, as it executes on a system independent browser. In no case is the installation of any other program required for Event4u to work. Event4u is a standalone application. Event4u does not require installation and does not modify the host system.

2.2 Product Functionality

These are the major functionalities of the software, Event4u will achieve:

- Provide different views to the user depending on his/her roles.
- Divide the available manpower into teams.
- Appoint a Team Head.

- Allocate different tasks to teams.
- Track expenditure.

2.3 Users and Characteristics

The system will support four types of user privileges:

- Toll Manager
- Toll Employee
- User [Vehicle Owner]

The various users that we expect the software to be used by are:

1.	Toll Manager	Manages the toll booth and head of the place
3	Toll Employee	Works there and maintains the payment option
4.	User	The vehicle Owner

Table no:3

All the above mentioned users are assumed to have a minimal knowledge of the technical aspects of a software product.

2.4 Operating Environment

The software will be designed to work on any version of Windows, Linux (kernel 2.7 and above) and Mac platform. The software is completely web based and runs on popular web browsers namely firefox, chrome, internet explorer (IE8 and above). These web browsers are preferred since they support HTML.

2.5 Design and Implementation Constraints

We have to design different pages for different types of users such as Vehicle Owner and Toll Employee and Toll Manager. The implementation part is yet to be done. But, we have a clear picture as to how our pages would look. The communication protocol will be http. There are a number of tools which can be used for its implementation. The maximum number of users at a time on the Toll software hand is based on the number of Toll booths for the particular road.

2.6 User Documentation

No tutorials have been developed as of now.

2.7 Assumptions and Dependencies

Assumptions

The user is familiar with internet and web based software like social networking sites.
The browsers which the user is using are either Google Chrome 10.0 and above or Mozilla Firefox 4.0 and above.

3. Specific Requirements

3.1. External Interface Requirements

3.1.1. User Interfaces

The user interface design is simple and clear. It is a simple and easy to use interface. We have a Toll manager's view, Vehicle Owner view and Toll employee view. The vehicle owner has to verify himself as a legitimate person and these UI will work smoothly. The vehicle if registered then the unique code registered will be displayed for each user on their user page. Users also have the option to add money to the account of Toll Org. That money can be deducted directly rather than this longer process.
The manager's UI is very simple and informative. It doesn't consist of any complexity.. It maintains the data from the toll and displays stats.
The employee UI is based on payment option and vehicle option. If any user is enabled to pay through the Toll Org. They are made to pay manually. Then a notification is passed on to the User in this case where he wasn't able to pay.

3.1.2. Hardware Interfaces

Not applicable.

3.1.3. Software Interfaces

The software is operating system independent. It would run on Linux, Windows and Mac. It needs an internet connection and the OS must support any of the known web servers.

3.1.4. Communications Interfaces

A web browser is a basic necessity for the software to be deployed. Authentication is done by HTTPS security and Firebox.

3.2. Functional Requirement:

The web-based Toll Booth Organization systems being developed is generic. It can be used to manage any type of event, be it customized events or event types that are provided as templates:

- **Toll Handler:**

  This handles all the information that a toll needs about the vehicles and the amount of money they have earnt each day. Keeps track of charges on each vehicle based on payment paid or not etc.

- **Toll Employee software:**

  There has to be an employee in case of manual toll collection or for the software handling. If the collection price changes it has to be manually

  updated for each road.

- **Payment Received:**

  If payment is received then the barrier will be automatically lifted. A Pay ticket is generated based on the car type and toll.

- **Automatic Scanning:**

  Each car will be given a set of codes and this code will be automatically scanned and the amount will be calculated by finding out the Type of vehicle.

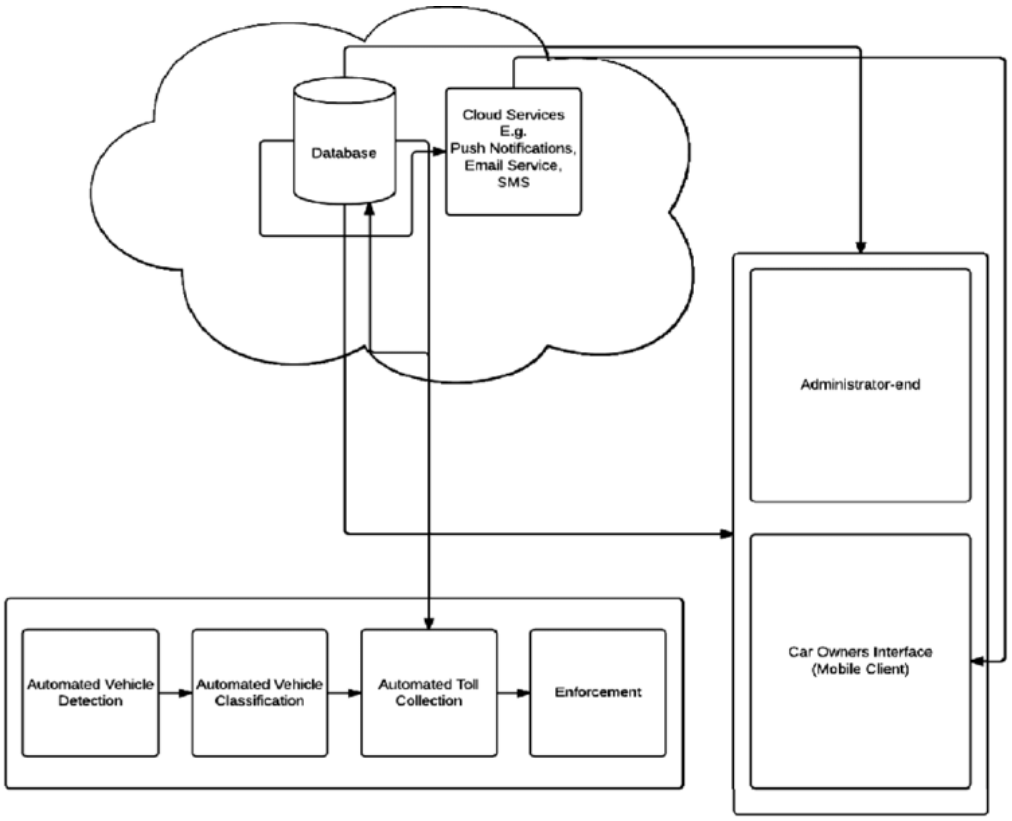
3.3. Behavior Requirements

3.3.1 Use Case View

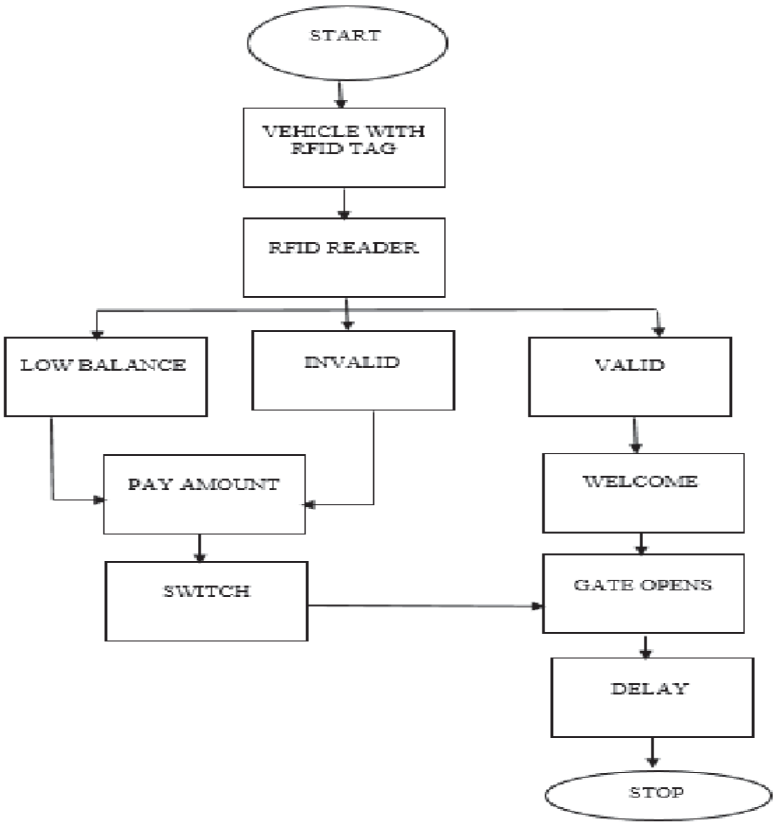
There are 4 Actors in this web project:

Vehicle Owner, Toll Booth Manager and Toll employee.

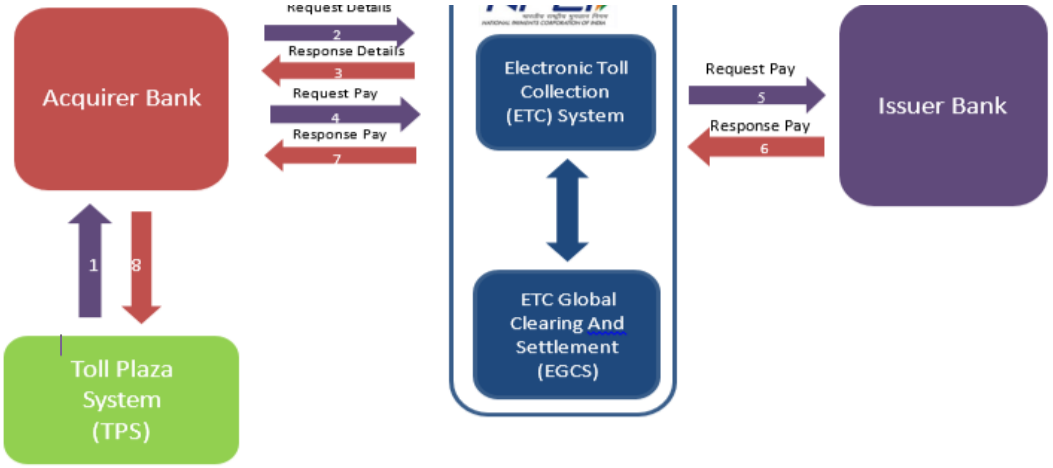
Each of these entities are represented in the below figure and their working. Each of them have their unique function for the entire system to work hand in hand.



This process is Looped around till the software is shut down.



Transaction related process:



4. Other Non-functional Requirements

4.1. Performance Requirements

- Any transaction will not take more than 10 seconds.
- Multiple users are supported.
- System runs smooth 24/7 provided good internet
- All the transactions are safer and faster.

4.2. Safety and Security Requirements

- The user has to login using a password and username given.
- Each account will be verified with KYC details.
- Total toll earning only can be seen by the Toll manager.
- A log file about the daily vehicle count and other warning systems are generated at the end of the day.

4.3. Software Quality Attributes

The software will be built on react js .The Firebase database is used for storing user data. The software is very secure and has a verification on both ends before the transaction takes place. This helps in faster transactions and much safer too. In case of transaction failure there is a manual way in which you can pay the toll employee. So the software doesn't break in any case.

5. Other Requirements

5.1 Technical Feasibility:

The current solution to the software was decided based on

- The complexity of the technical resources needed.
- The manpower needed to implement the project.
- Team member's prior experience with the technology.
- Ease of learning the implementation tool that firebase, Safe payment.
- The limited time constraint empowered by django which is specialized for agile development.

Appendix A – Data Dictionary

1	Employer	Employer is an individual who has contacted the event organizer.
2	Toll Manager	Event Manager is an individual who is responsible for the whole event and can view the entirety of the event being planned on the software.He/She is usually the lead event organizer.
3	HTTPS	HTTPS stands for Hypertext Transfer Protocol Secure.This protocol is a widely used communications protocol for secure communication over a computer network, with especially wide deployment on the Internet.
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