Toll Booth Management System

Project Plan Document

Introduction

The main purpose of this project is to build a proper-functioning toll system. This system will collect the correct toll value, according to the vehicle's class, automatically, on arrival of the vehicle at the tollbooth.

Deliverables of the project

Login page: Here the user enters a valid username and password to login.
Registration page: If the user does not have a pre-existing account, they can create one.
Digital wallet: Money available in the digital wallet. Options to add or deduct the money (by the user) using the bank account details the user has linked.
Toll history: The complete history of tolls paid by the user. This contains the amount, date and location.
Standards and constraints: GUI must be consistent and official.

Process model

Our ideal process model would be agile, as this is used when product, process and resources are low according to the degree of certainty table. This also ensures that we quickly adapt to change and minimize risk. We would have better engagement with the stakeholders of the tollbooth system.

Standards, guidelines, procedures

Corporate/ Regulatory policies:
- Waiting time between each vehicle should be not more than 10 seconds.
- The queue of cars should not go beyond 100 meters; in such a case, cars would be allowed to pass without paying a toll.
- A yellow line marks the 100 meters point.

Procedure:
We will examine the image of the number plate & class of vehicle, the respective information will be processed for the toll collection system. We are trying to develop a system that would pay the toll automatically and reduce the queue at the toll booth by deducting the appropriate toll amount from the user's digital wallet.

Management activities

1. Project planning and Tracking

2. Project Resource Management

3. Scope Management

4. Estimation Management

5. Project Risk Management

6. Scheduling Management

7. Project Communication Management

8. Configuration Management

Risks

Possibility of double deduction of the amount, Insufficient balance in the account, Improper timing of the barrier movement and privacy of the user details can be some of the risk factors in this project with respect to the hardware and software.

Staffing

Using the *COCOMO model*, average staff requirement for various phases is calculated.
a chief-programmer, who has a backup programmer, a program librarian, and some programmers.
It consists of project leaders who have a class of senior programmers under him, while under every senior programmer is a group of junior programmers.

Quality criteria/assurance

A meeting in which the software product is examined by both the internal and external stakeholders to seek their comments and approval.
Functional and Interface specifications.
Error handling and recovery.
Inspection of the work products and its related information to determine if the set of standard processes were followed or not.

Work packages and Effort Estimate

We have chosen Organic system from the COCOMO model as our team size is small, problem statement is understood by all and members have nominal experience working on a similar project.

Software Projects	a	b	c	d
Organic	2.4	1.05	2.5	0.38

$$E = a * (KLOC)^b$$

$$D = c*(E)^d$$

Login page: KLOC= 2   E= 4.97 person per month   D= 4.6 months

Registration page: KLOC= 1.2   E= 2.9 person per month   D= 3.8 months

Database: KLOC= 1.5   E= 3.67 person per month   D= 4.1 months

Payment window: KLOC= 0.5   E= 1.16 person per month   D= 2.6 months

Budget and schedule

We have decided to use COCOMO model. Thus, our budget would be optimal, it would not be overestimated.
Our team will make sure to deliver the product to the market, fully functional, as soon as possible.

Change control process

- Creating a request for change
- Reviewing and assessing a request for change
- Planning the change
- Testing the change
- Creating a change proposal
- Implementing changes
- Reviewing change performance
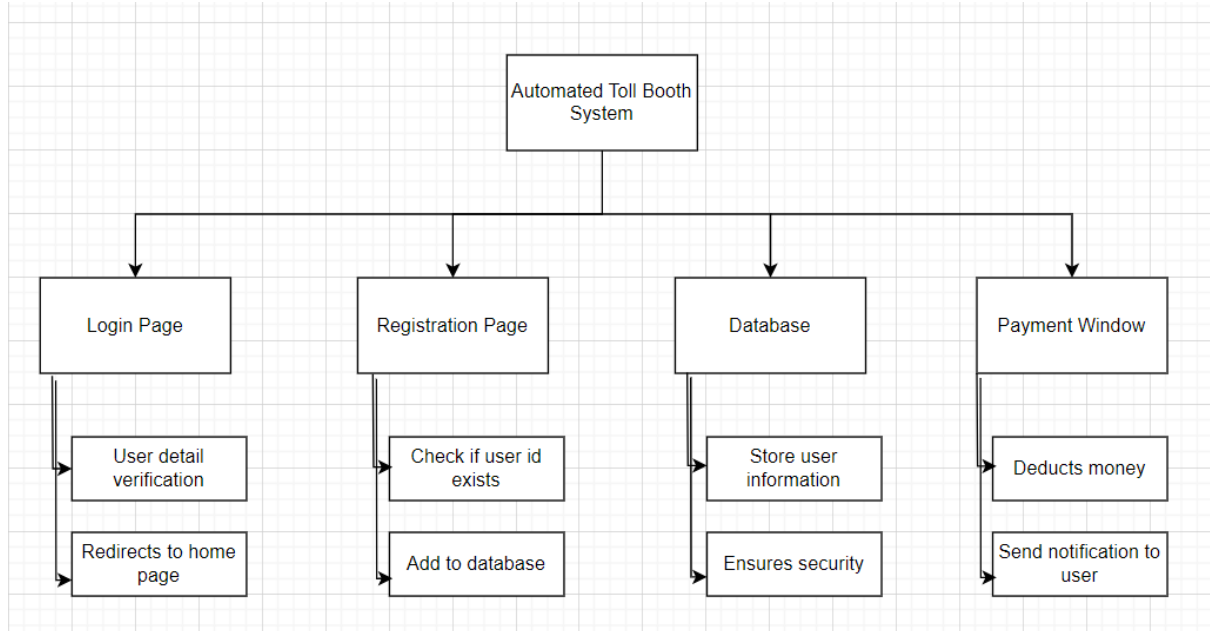- Closing the process

Tools

Planning tool: JIRA
Design tool: draw.io
Version control: GitHub
Development tool: VS Code, Google Collab

Bug tracking: Bugzilla
Testing: No-Code

Work Breakdown Structure

Gantt Chart for scheduling