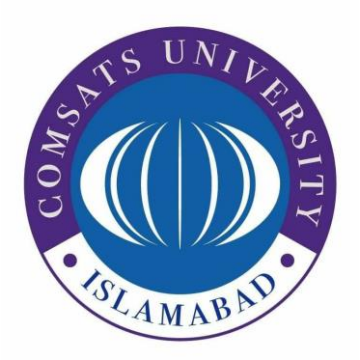
Toll Plaza Management System



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Chapter 1
Introduction

Purpose

In Pakistan Toll Plaza Management System is used on Motorways and GT road, the basic Purpose of Toll Plaza System is to collect taxes for the new roads that government built to recover the money spend on building that road. Tax depends on the type of car passing through Plaza Low Top Vehicles have different taxes from High Top Vehicles. After the tax is received the token is given to the person to travel on the road.

Document Conventions

When writing then SRS document for Atlantic Lottery Corporation the following terminologies are used:

LTV Low Top Vehicle
HTV High Top Vehicle
NHA National Highway Authority

To make the document more effective and readable I used Time New Roman font style and font size and headings are bold and highlighted with attractive colors.

Intended Audience and Reading Suggestions

This document is written for the researchers, project managers, programmers, designers, developers, testers, documentation writers, users involved in the Toll Plaza, modification of online website This project is a prototype for the Toll Plaza management system and it is restricted within the Pakistan premises. This has been implemented under the guidance of my University professors. Government employees will be the user of this system to keep the track of all car pass through the plaza the person who want to use the government roads, the person driving on Motorways and GT road will be the Customer.

Product Scope

Scope of our project is limited not storing any personal data about person traveling. Only the details of the car are stored in system like color and No. plate of car. To overcome time consuming problem we also introduced the E-TAG packages.

Reference

There was no previous automated system in so got no reference.

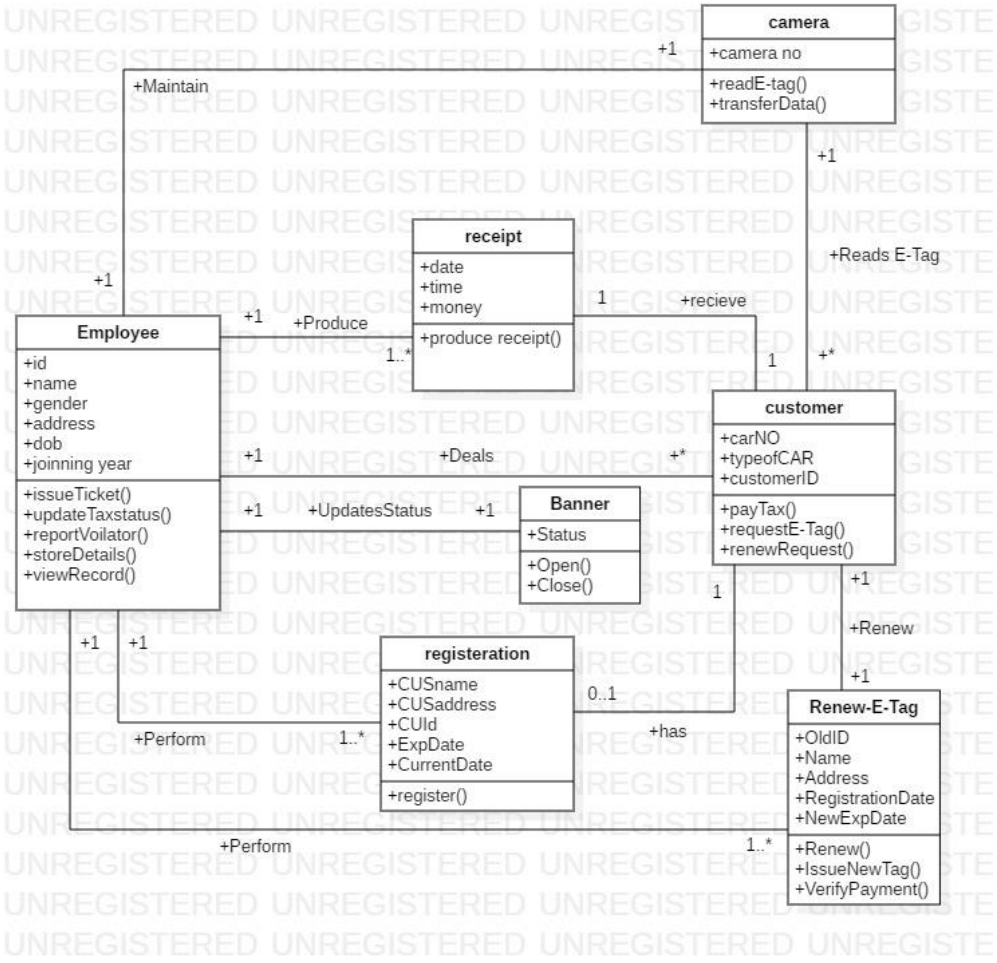
Chapter 2
Overall Description

Product Perspective

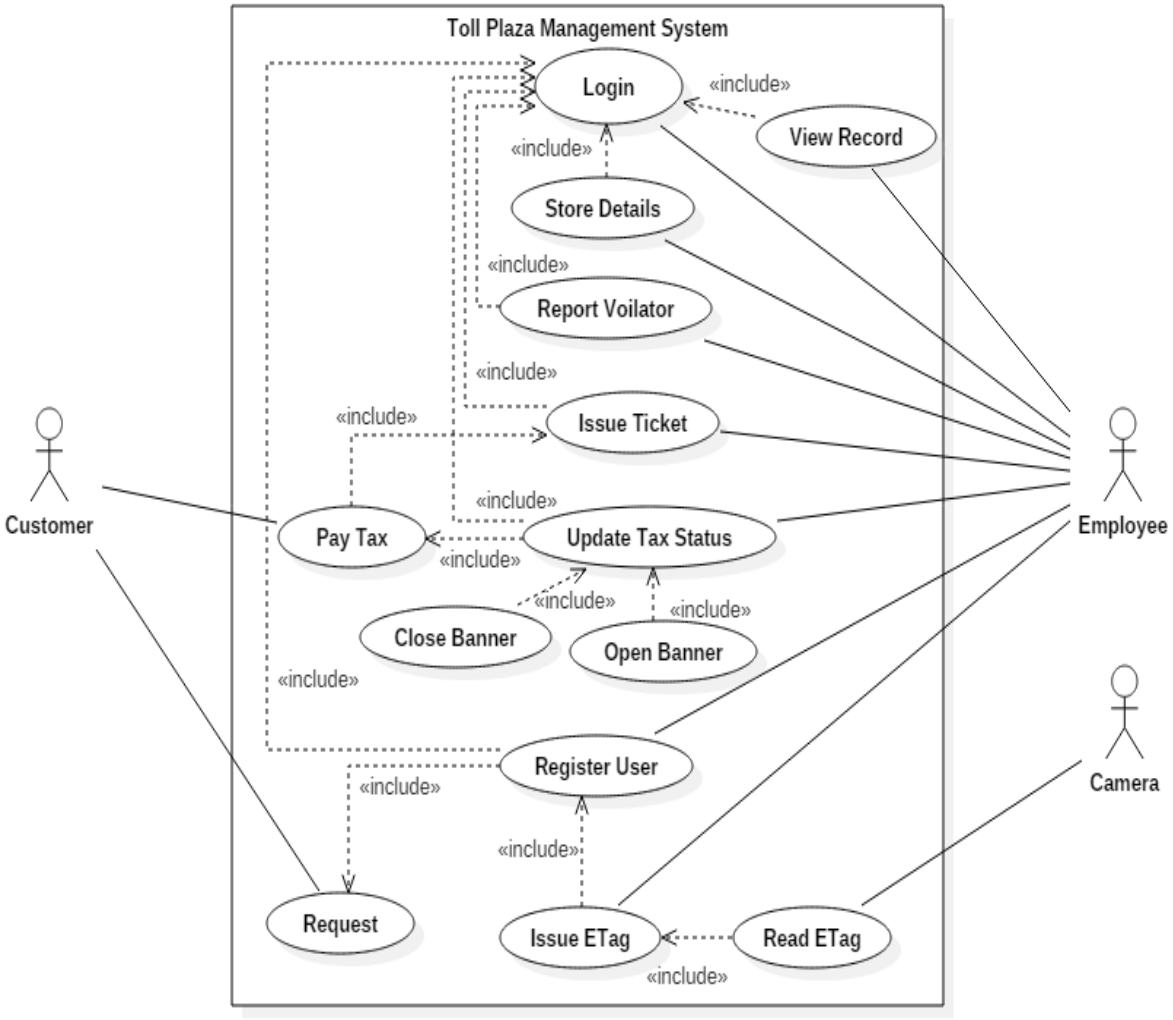
Task and procedure that will be used to develop the software are the seven steps of software development cycle like Elicitation, Elaboration, and Inception. Communication with our buyers to get the clear picture of software according to their requirements. The task our system will perform are generating auto ticket for every type of car LTV and HTV. Entry of car details will not be manual; data entry is computerized. E-tag package is provided to customer who want to pass through toll plaza without stopping to pay tax. Their taxes are deducted through E-Tag card automatically when passed through plaza

Product Function

The major feature of toll plaza management system are shown in figure



Use Case


Toll Plaza Management System
Login
View Record
Store Details
Report Voilator
Issue Ticket
Pay Tax
Update Tax Status
Close Banner
Open Banner
Register User
Request
Issue ETag
Read ETag
«include»
Customer
Employee
Camera

User Classes and Characteristic

The user of this system will be all the people who are intending to use motorway for their traveling

Operating Environment

This software will be developed using Object Oriented Java Language as it's contain the vast library and support the GUI (Graphical User Interphase) and SQL Server for maintaining the database and the record's. Hardware requirements are not that much high that what also make it portable.

- 40GB Hard Disk (min)
- 2 GB RAM (min)
- Core i3 2.4GHz (min)

Design and Implementations Constraint

- Only government Security agencies like Army, Police and Ambulance are free to pay the taxes.
- NO bike, Cart and Animals ride is allowed to pass through Motorway Toll Plaza.

Assumption and dependencies

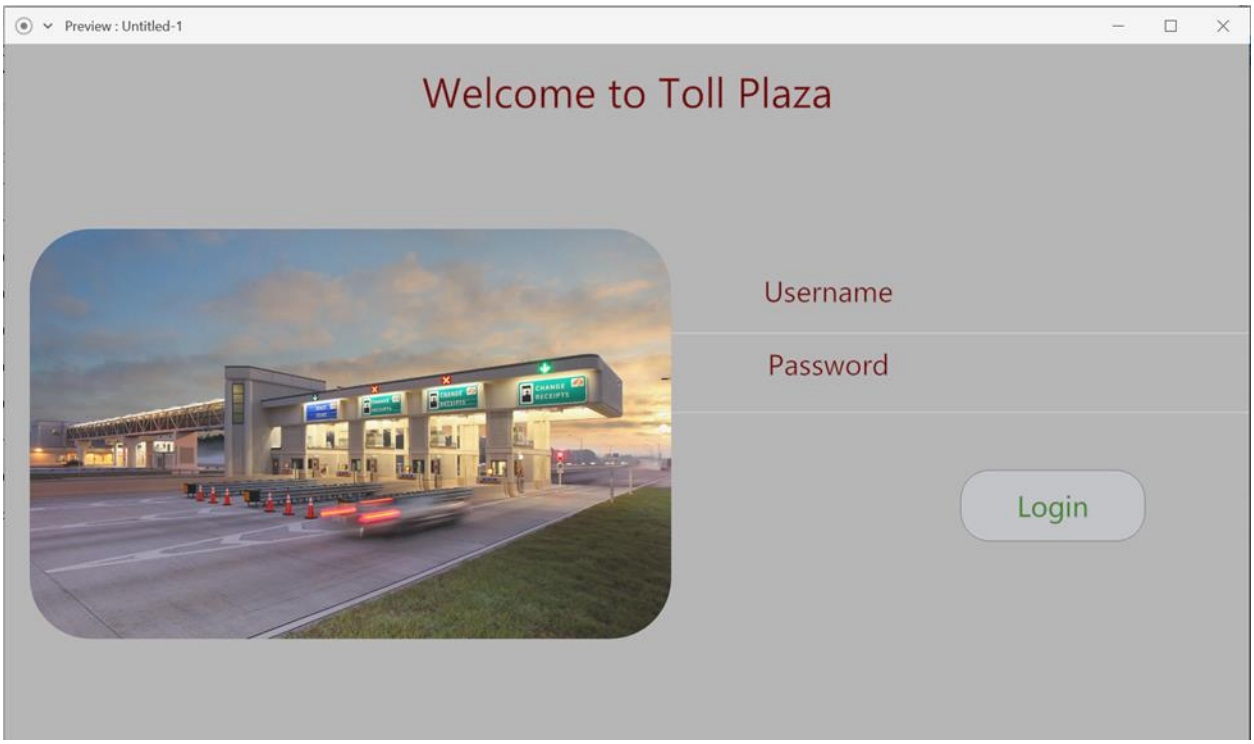
- The external interface for reading the toll tag and license plate information of vehicles has been installed and is working as per the requirement.
- Every vehicle owner has an e-mail id associated with the toll plaza as all receipts will be sent via e-mails only.

Chapter 3

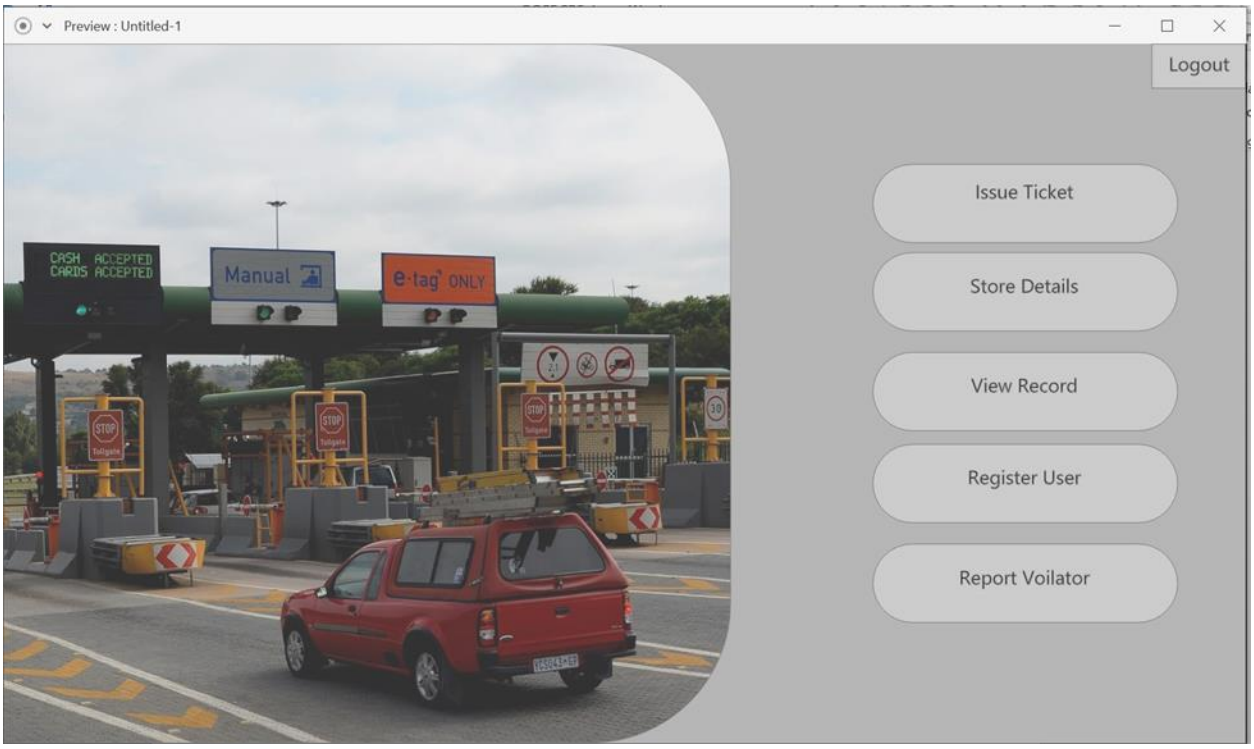
External Interface Requirements

User Interface

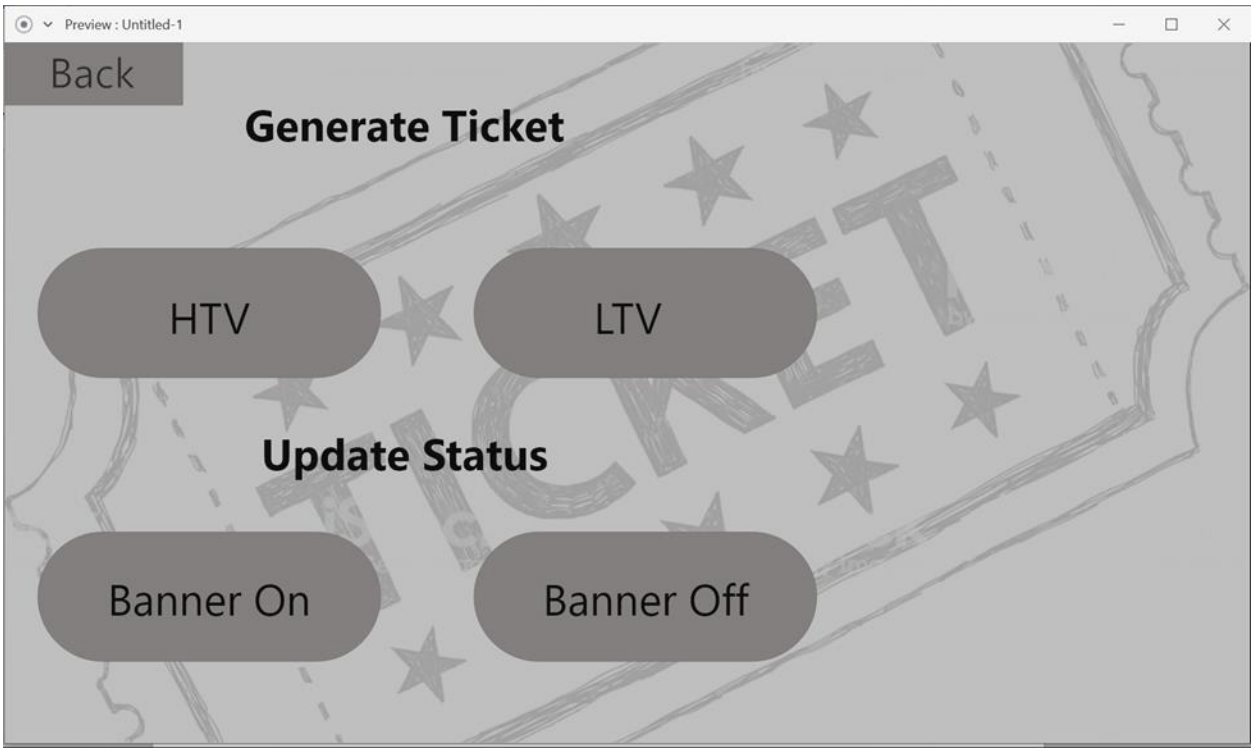
Login Page



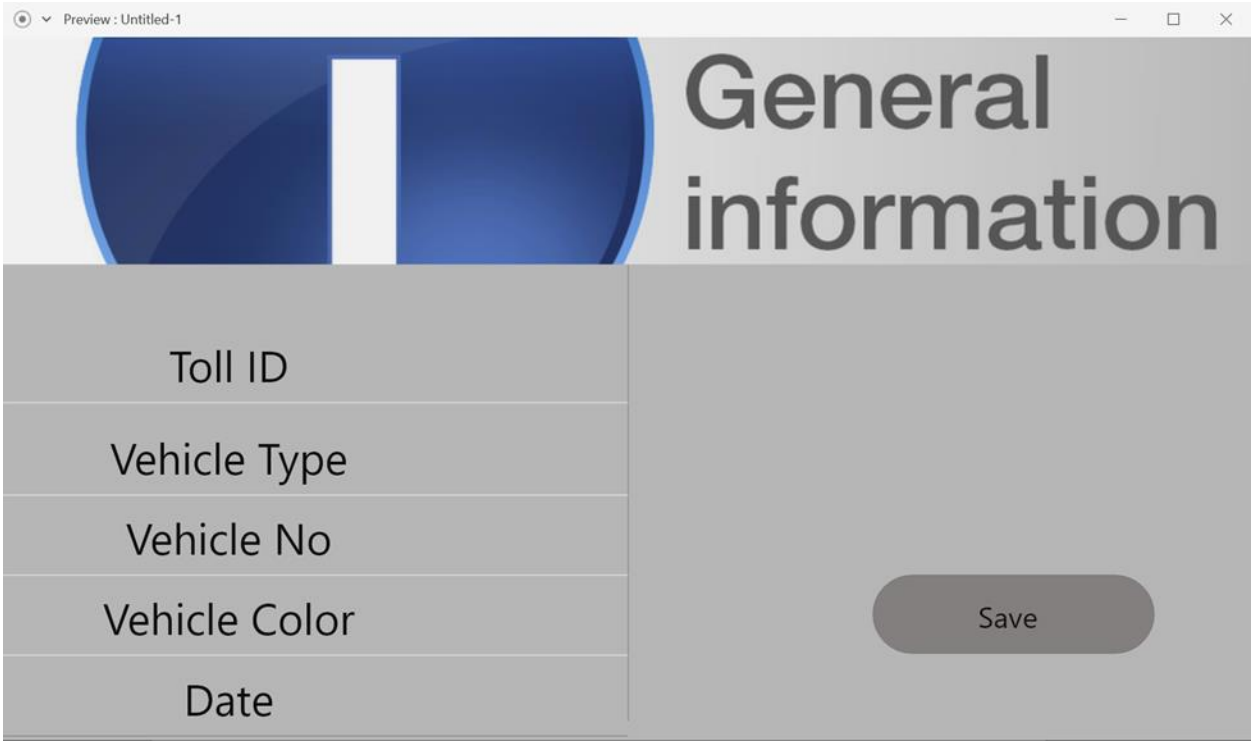
Home Page


Preview : Untitled-1
Logout
CASH ACCEPTED
CARDS ACCEPTED
Manual
e-tag ONLY
Issue Ticket
Store Details
View Record
Register User
Report Voilator

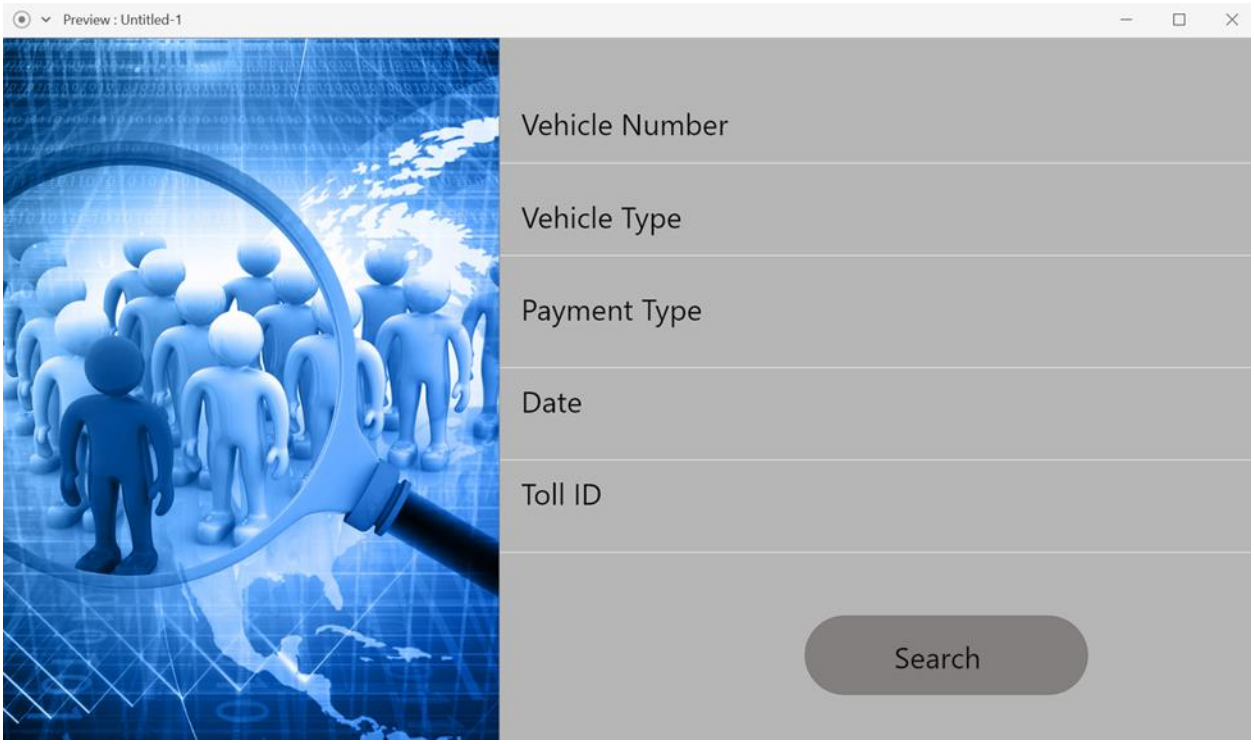
Generate Ticket



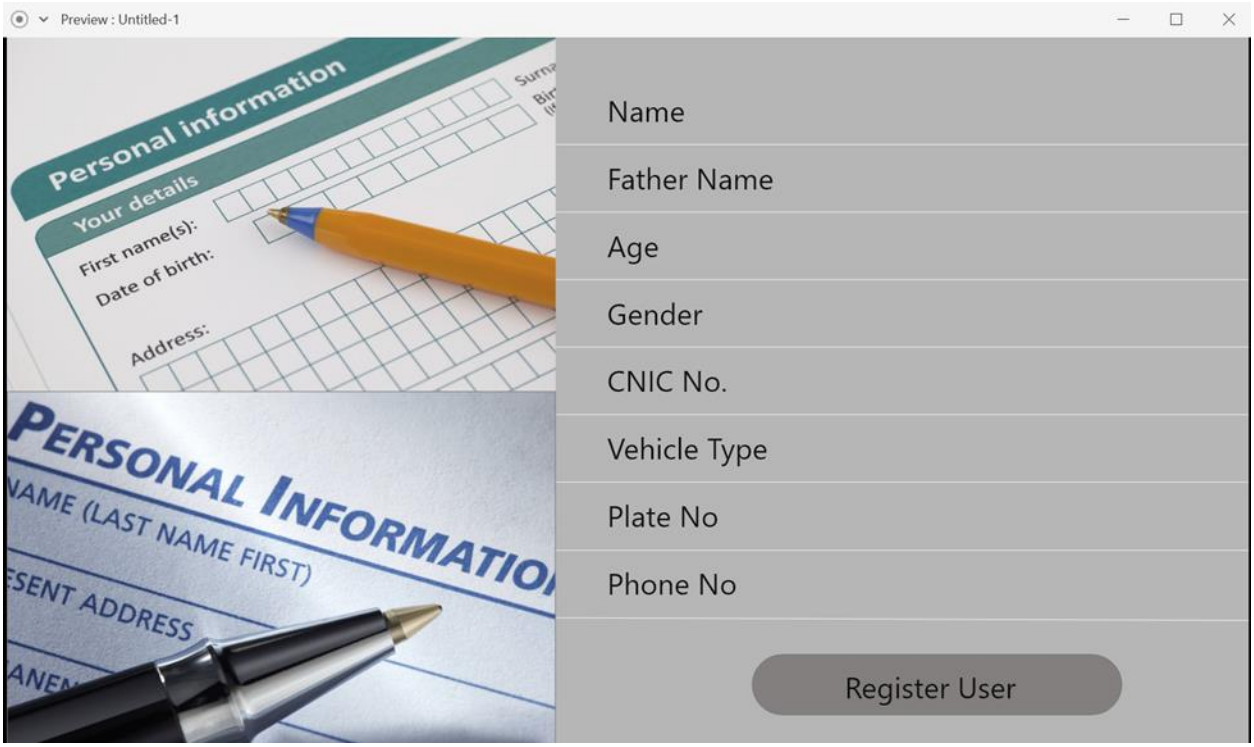
Storing info page



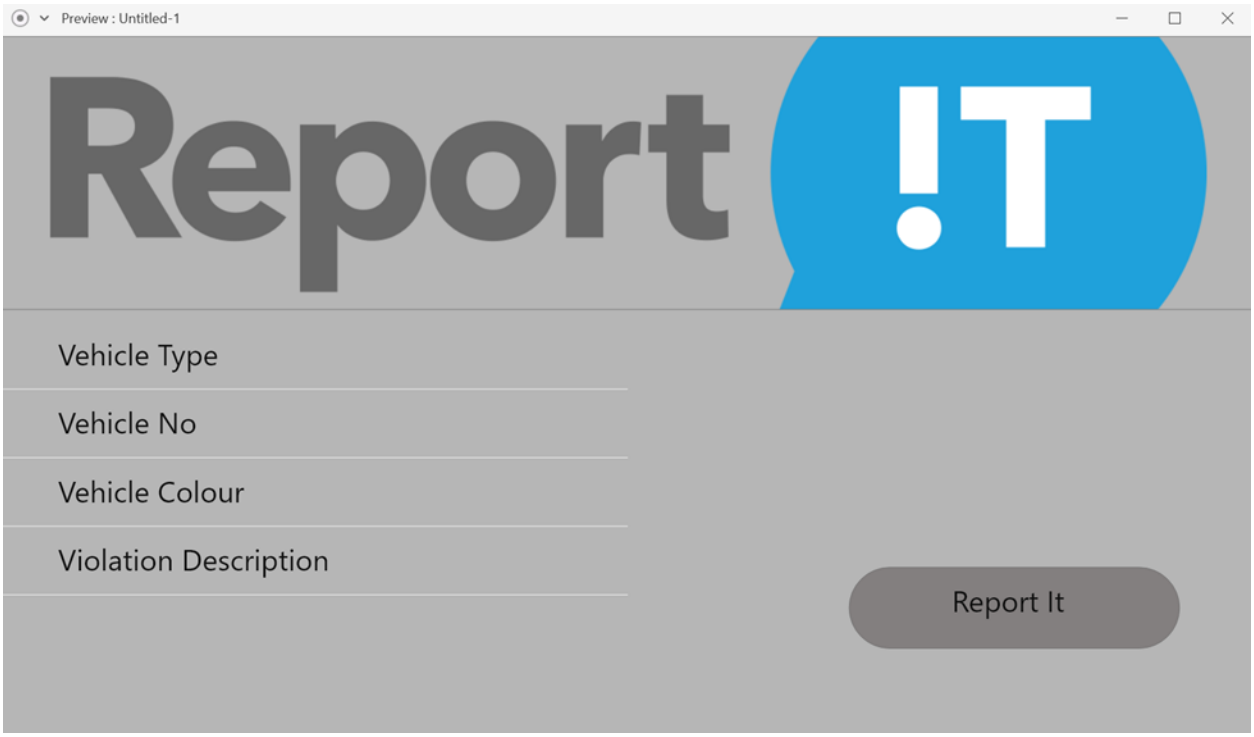
View Record Page



Register New User (E-Tag)



Report Page



Hardware Interfaces

- Windows.
- A browser which supports CGI, HTML & JavaScript.

Software Interface

Following are the software used for the flight management online application.

Software used	Description
Operating system	We have chosen Windows operating system for its best support and user-friendliness. (Window 10 Pro)
Database	To save the Car records, passengers records we have chosen SQL+ database.
VB.Net	To implement the project we have chosen Vb.Net language for its more interactive support.
C#	For GUI C# is used as it is powerful and easy to use.
Prototyping	Adobe XD is used for its user friendly features

Chapter 4

System Feature

Stimulus/Response Sequence

Login:

Use Case: Login	
Actors: Employee	
Goals: To allow authorized users to login and prevent others to access system.	
Pre-Condition: Must be registered/employee.	
Post-Condition: Login successfully.	
Related Use Cases: All use cases are dependent on login except “Pay Tax”.	
Steps:	
Actor Actions	**System Responses**
1. Provide login information.	1.a Verification

View Record:

Use Case: View Record	
Actors: Employee	
Goals: To allow employee to view record.	
Pre-Condition: Must be login and data must be present.	
Post-Condition: Record viewed successfully.	
Related Use Cases: Login use case is must for this use case.	
Steps:	
Actor Actions	**System Responses**
1. Provide login information.	1.a Verification
2. Click on view record button.	2.a Viewed Successfully.

Store Details:

Use Case: Store Details
Actors: Employee

Goals: To allow employee to store details to further proceed tax process.	
Pre-Condition: Customer must be present or camera must provide information by reading E-Tag.	
Post-Condition: Information stored and ticket can now be issued.	
Related Use Cases: Login use case is must for this use case.	
Steps:	
Actor Actions	**System Responses**
1. Provide login information. 2. Click on store details button. 3. Input information. 4. Press save button.	1.a Verification 2.a Form is displayed. 4.a Stores in database.

Report Violator:

Use Case: Report Violator	
Actors: Employee	
Goals: To allow employee to report a person who is involved in any kind of violation.	
Pre-Condition: Customer must be involved in violation.	
Post-Condition: Reported to traffic police.	
Related Use Cases: Login use case is must for this use case.	
Steps:	
Actor Actions	**System Responses**
1. Provide login information. 2. Click on report button. 3. Input information and reason. 4. Press save button.	1.a Verification 2.a Form is displayed. 4.a Information is sent to traffic police.

Issue Ticket:

Use Case: Issue Ticket	
Actors: Employee	
Goals: To allow employee issue ticket.	
Pre-Condition: Information regarding ticket must be stored.	
Post-Condition: Ticket issued successfully.	
Related Use Cases: Login use case is must for this use case and Pay Tax use case is dependent on this.	
Steps:	
Actor Actions	**System Responses**
1. Provide login information. 2. Click on store details button. 3. Input information or get information from camera. 4. Press save button.	1.a Verification 2.a Form is displayed. 4.a Stores information in database and Issues ticket.

Open Banner:

Use Case: Open Banner	
Actors: Employee	
Goals: To allow employee to open banner.	
Pre-Condition: Tax must be paid.	
Post-Condition: Banner opened successfully.	
Related Use Cases: Update Tax Status use case is must for this use case.	
Steps:	
Actor Actions	**System Responses**
1. Provide login information. 2. Click on store details button. 3. Input information or get information from camera. 4. Press save button. 5. Customer pays the tax. 6. Employee updates the tax status.	1.a Verification 2.a Form is displayed. 4.a Stores information in database and Issues ticket. 6.a Status updated successfully.

7. Opens the banner by pressing button.	7.a Banner opened successfully.

Close Banner:

Use Case: Close Banner	
Actors: Employee	
Goals: To allow employee to close banner.	
Pre-Condition: Banner is open or tax is not paid.	
Post-Condition: Banner closed successfully.	
Related Use Cases: Update Tax Status use case is must for this use case.	
Steps:	
Actor Actions	**System Responses**
1. Provide login information. 2. Click on store details button. 3. Input information or get information from camera. 4. Press save button. 5. Customer pays the tax. 6. Employee updates the tax status. 7. Opens the banner by pressing button. 8. Closes the banner by pressing button.	1.a Verification 2. a Form is displayed. 4. a Stores information in database and Issues ticket. 6.a Status updated successfully. 7.a Banner opened successfully. 8.a Banner closed successfully.

Register User:

Use Case: Register User	
Actors: Employee	
Goals: To allow employee to register a customer for E-Tag.	
Pre-Condition: Customer must request for E-Tag.	
Post-Condition: E-Tag issued successfully by proceeding registration process.	
Related Use Cases: Request use case is must for this use case.	
Steps:	
Actor Actions	**System Responses**
1. Provide login information. 2. Receives the request for E-Tag. 3. Inputs information. 4. Press save button. 5. Customer pays the due. 6. Employee updates the due status. 7. Register the customer by pressing button.	1.a Verification 2.a Request is displayed. 4.a Stores information in database. 6.a Status updated successfully. 7.a Customer registered successfully.

Issue E-Tag:

Use Case: Issue E-Tag	
Actors: Employee	
Goals: To allow employee to issue E-Tag to a customer.	
Pre-Condition: Customer must be registered for E-Tag.	
Post-Condition: E-Tag issued successfully.	
Related Use Cases: Register use case is must for Issue E-Tag while Read E-Tag is dependent on this Use case.	
Steps:	
Actor Actions	**System Responses**
1. Provide login information. 2. Receives the request for E-Tag. 3. Inputs information. 4. Press save button.	1.a Verification 2.a Request is displayed. 4.a Stores information in database.

5. Customer pays the due. 6. Employee updates the due status. 7. Employee issues E-Tag.	 6.a Status updated successfully. 7.a E-Tag issued successfully.

Pay Tax:

Use Case: Pay Tax	
Actors: Customer	
Goals: To allow customer to pay tax.	
Pre-Condition: Customer must be passing through toll plaza.	
Post-Condition: Tax issued successfully.	
Related Use Cases: Issue Ticket use case is must for this use case while Update Tax Status is Dependent on this use case.	
Steps:	
Actor Actions	**System Responses**
1. Gets ticket. 2. Pays the tax	2.a Tax status updated successfully.

Request:

Use Case: Request	
Actors: Customer	
Goals: To allow customer to request for E-Tag.	
Pre-Condition: no pre-condition.	
Post-Condition: Request submitted successfully.	
Related Use Cases: Register User is dependent on Request use case.	
Steps:	
Actor Actions	**System Responses**
1. Requests for E-Tag.	1.a Request submitted successfully.

Read E-Tag:

Use Case: Read E-Tag	
Actors: Camera	
Goals: To allow camera to read E-Tag.	
Pre-Condition: Vehicle must have E-Tag.	
Post-Condition: E-Tag read successfully and information is provided to the system.	
Related Use Cases: Issue E-Tag is must for this use case.	
Steps:	
Actor Actions	**System Responses**
1. Reads E-Tag. 2. Provides information to the system.	2.a Information received successfully.

Functional Requirement

Login

Our system will be used by government employee. These employees will be given their ID for login into the system. So no one other than employee can access the system. Security and privacy is provided.

Storing car details

Employee will store the details of vehicles for keeping record of all vehicles passing through toll plaza. Information stored will be about vehicles type, model and car plate number etc.

Issue Ticket

User of system will be able to issue ticket to the customer on basis of vehicles types. For high top vehicles and low type vehicles tax will be different.

Tax status

After the tax has been collected by the employee the status of vehicle will be updated to ‘tax paid’.

Banner Off

When tax will be paid the banner that stop the car will be turned off as result of update status.

Banner On

Banner will stay on at entry of car and after leaving of car through toll plaza. Banner will only turn of as status updates.

Report violator

Employee will give function if someone violate the rules, like passing through toll plaza without paying tax or trying to douche the system will be reported to NHA and will be fined.

Allowing Government Vehicles

System will allow government vehicles pass through plaza without paying any taxes.

E-tag Reader

System will be given functionality to read E-Tags on vehicles. The vehicles with E-tag will not pay taxes and passes through special E-tag line that include E-tag reader. E-tag is a special prepaid package provided by NHA.

Non-Functional Requirements

This Toll plaza management system can work in the accompanying attributes.

Ease of use

Any commonplace in utilizing windows task can work the framework since it have easy to use UI. Which have the guidance menu's the manner by which to utilize it which self-order application at that point can be utilized the framework without uncertainty.

Task

The toll plaza management system will be used by employee and controlled by the admin for safe work.

Supportability

This Toll plaza Management System works in any adaptation of windows working framework. For example, windows XP, windows 2003, windows 7, windows 8 and other related forms.

Usage

The framework is executed in Intel(R) Core(TM) i3 processor with 2 GB RAM,32 bit PC. What's more, it is actualized through testing on both High contrast testing. The dialect we utilize execute the framework is Abode XD, C#, SQL database.

Chapter 5

Implementation

Safety Requirements

If there is extensive damage to a wide portion of the database due to catastrophic failure, such as a disk crash, the recovery method restores a past copy of the database that was backed up to archival storage (typically tape) and reconstructs a more current state by reapplying or redoing the operations of committed transactions from the backed up log, up to the time of failure.

Security Requirements

Security systems need database storage just like many other applications. However, the special requirements of the security market mean that vendors must choose their database partner carefully.

Software Quality Attributes

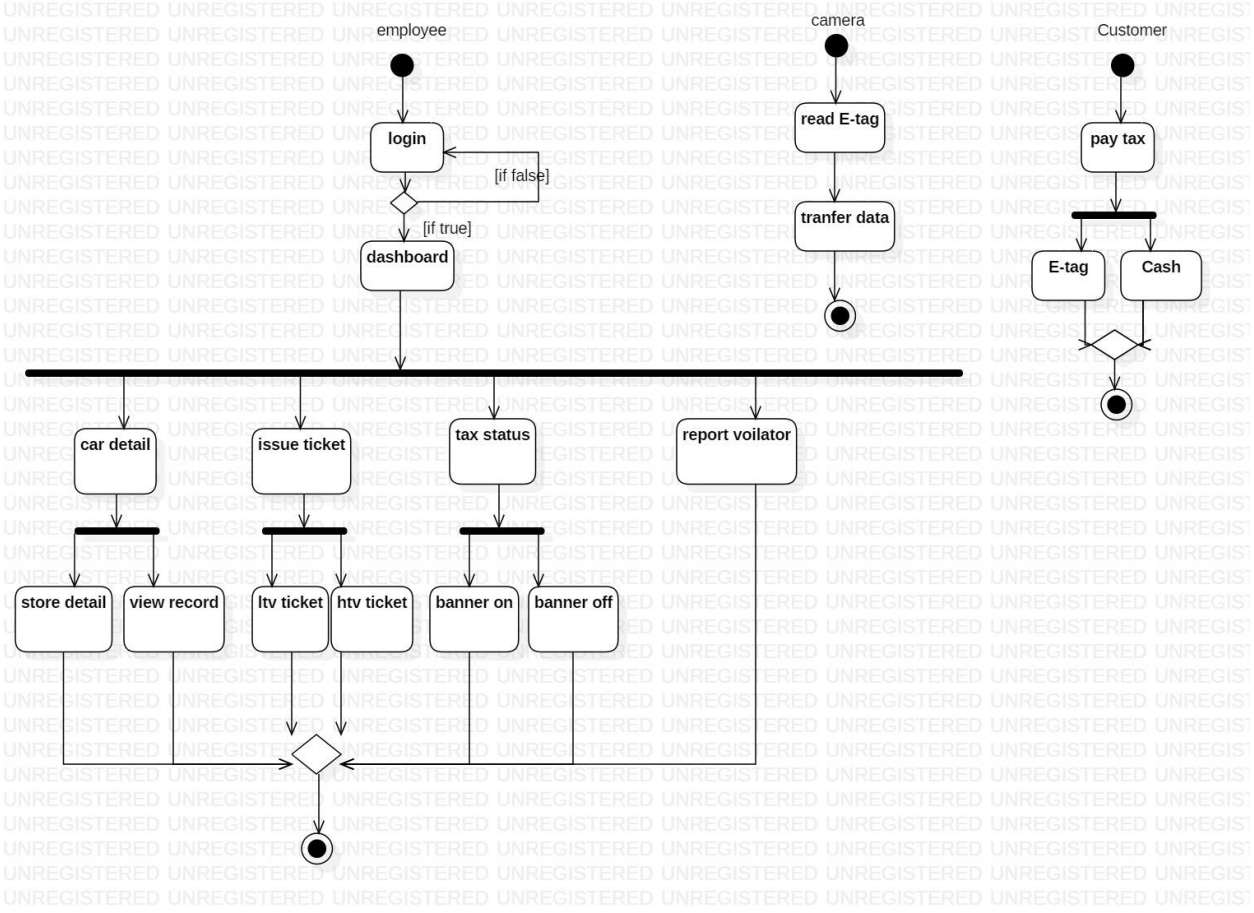
- **AVAILABILITY:** The System should be available on the all specified date and specified time.
- **CORRECTNESS:** The fine system will accept will be according to rules and regulations.
- **MAINTAINABILITY:** The administrators and system in chargers should maintain the system and not misuse for personal issues .
- **USABILITY:** The system will be usable even when customers are overloaded without any delay.

Appendix A: Glossary

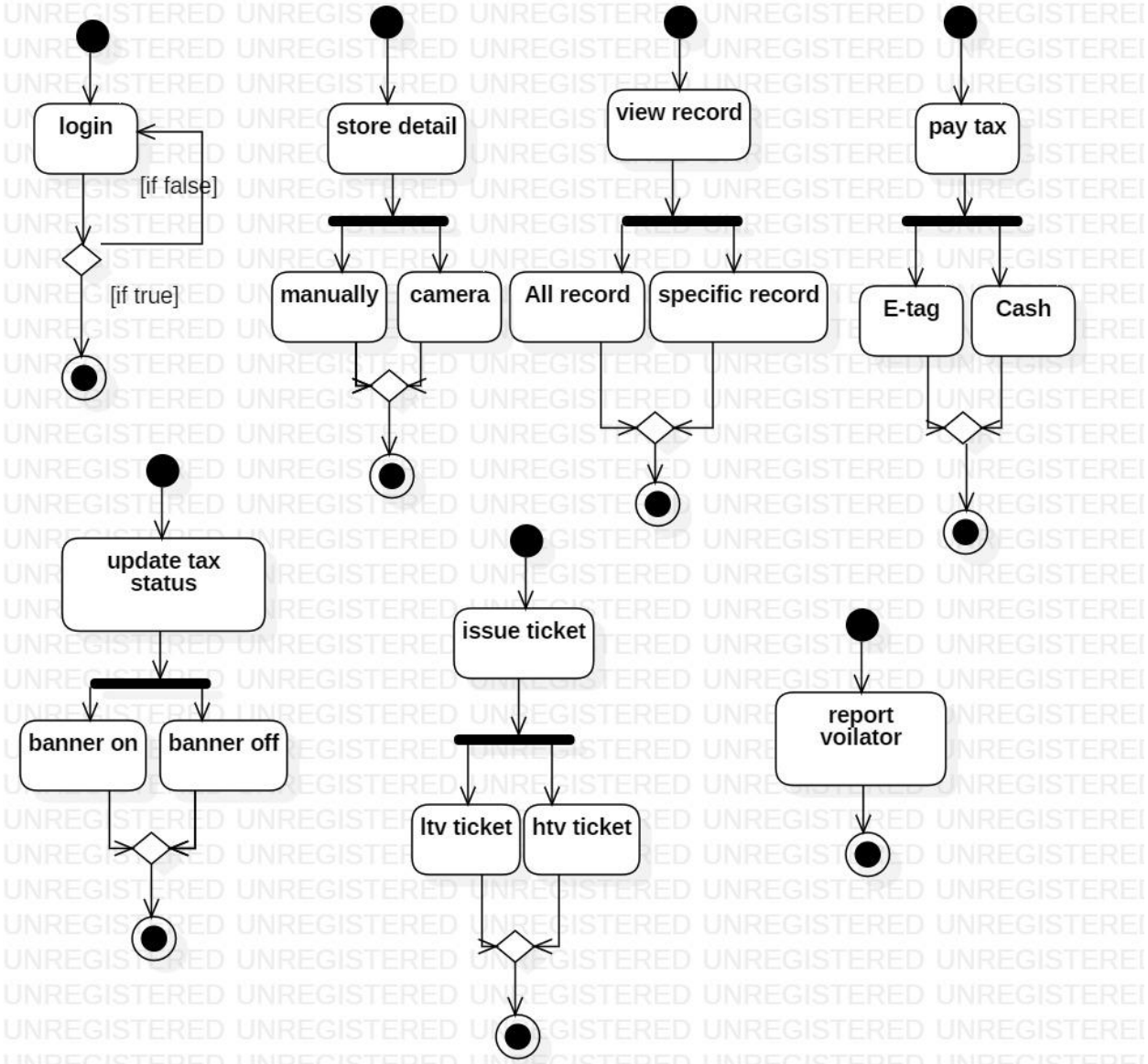
LTV	Low Top Vehicle
HTV	High Top Vehicle
NHA	National Highway Authority
DB	Database
C#	Language for Programming
E-Tag	Electronic-Toll Collection

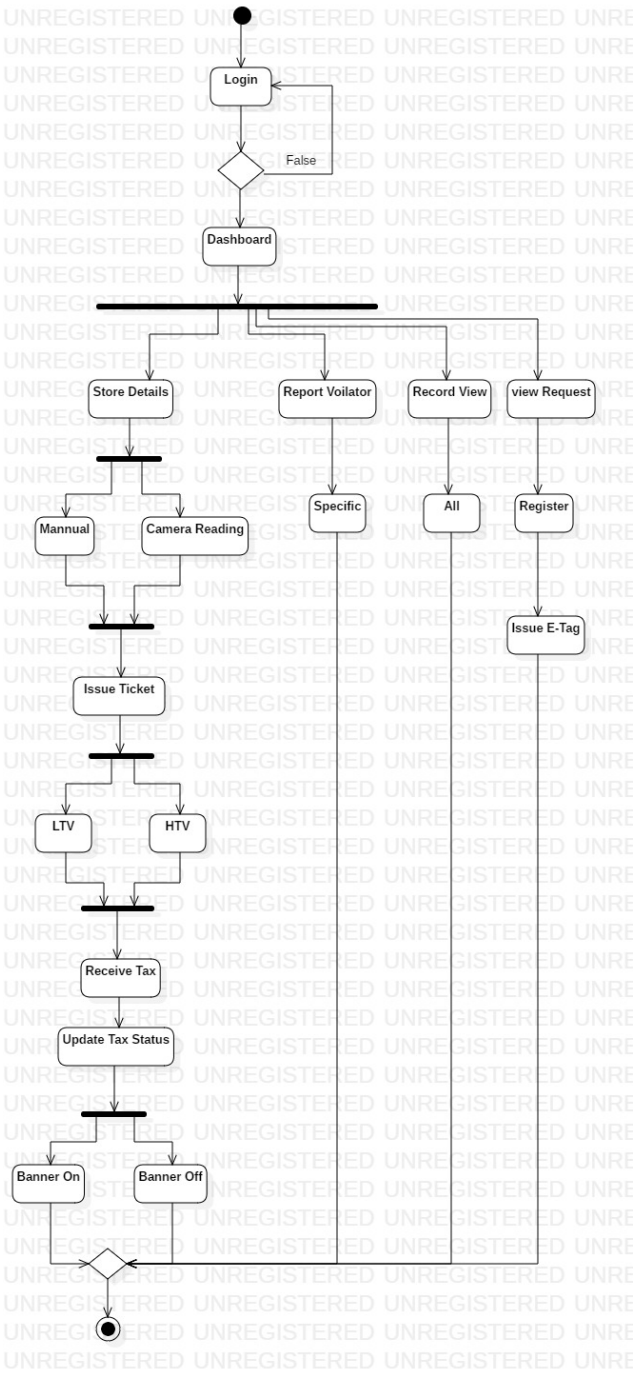
Appendix B: Analysis Models

Activity Diagram



Every User-Case




Login
False
Dashboard
Store Details
Report Voilator
Record View
view Request
Mannual
Camera Reading
Specific
All
Register
Issue E-Tag
Issue Ticket
LTV
HTV
Receive Tax
Update Tax Status
Banner On
Banner Off

Sequence Diagram