1. Project Overview

Our Idea to develop Enhance Driving license system is to make use of current technologies such as NFC (Near Field Communication) and android application which can be used by policeman with help basic android phones for maintaining Law and order on our roads. Our system works by using simple android application on mobile phones which will detect the NFC tags on the license to obtain every information about the driver on policeman's smart phone. The police man can check for details of driver, impose fine, check for previous offenses and can even monitor the cars location of drivers who do not stop at checkpoints using GPS. This system will help reduce corruption, apprehend serial offenders and help save precious lives. Our project follows Make in India and Digital India initiative of Prime Minister Modi & Govt. of India.

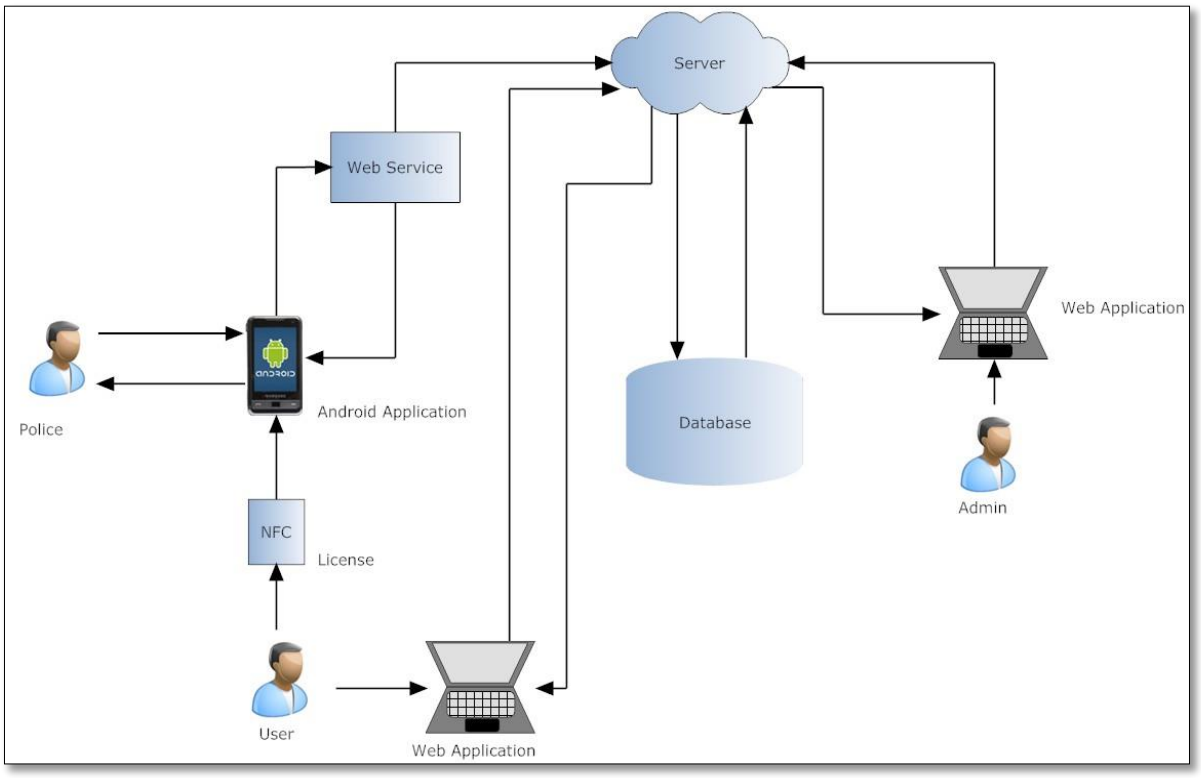

Fig1: System Architecture

2. Introduction & Motivation

2.1. Theory behind the project concept

The need for manual RTO based systems is completely reduced in this method and the RTO system works through NFC. A complete NFC system consists of a transponder (tag), reader/writer and computer host. The transponder, better known as the tag. The microchip contains memory to store a unique data and to receive and send data back to the reader. These tags are powered by the electromagnetic signal received from a reader. Development in technology bring digital world to be border-less. It's proven through a developed technology, when trade and transaction can be done not only using real money but also virtual one. Shopping process using virtual money has even more supported by existed Near Field Communication (NFC) device. This particular device works using radio frequency. In the year of 2011, Google was integrating this device into an Android-based cell phone, which made transactions using virtual money gradually developed.

The NFC tag is used as a unique identity for account of a particular user. When a vehicle driver caught bay a traffic police, its driver is prompted to scan his NFC tag. If the identity (serial number of the tag) is matched with the one already stored in the system, the historical records of that driver get fetch on a mobile phone. Traffic police can also place a new complaint about that driver. If police placed a new complaint then the fine amount will get deducted from his total balance. After this, the vehicle gets immediate access to drive through. This NFC based RTO system also has some additional features. A new user can register him with the system. Also an old user can recharge his account balance. The amount for recharge can be entered in the system. In beginning, the user is prompted to scan his tag or ID. The serial code of the tags identified by the reader module and is sent for comparison with stored data. If the ID is matched by the microcontroller, the fine amount is deducted from user's balance and user gets to drive through the area.

Special features:

1) NFC cards will replace current licenses

2) Android app which can be used by policeman.

3) Website used by admin to maintain the system.

4) GPS tracking facility.

5) Driver does not stop at signal then his car/bike can be put on alert list.

2.2. Problem Definition

The current system of License monitoring by police is completely manual and paper oriented. This has resulted in know proper records of an individual committing traffic offences.

Also manual system has given rise to rampant corruption which is poses big threat to safety on the roads as it fails to act on errant drivers and repeated offenders.

There is also no transparency between authorities and common public in terms of fines imposed.

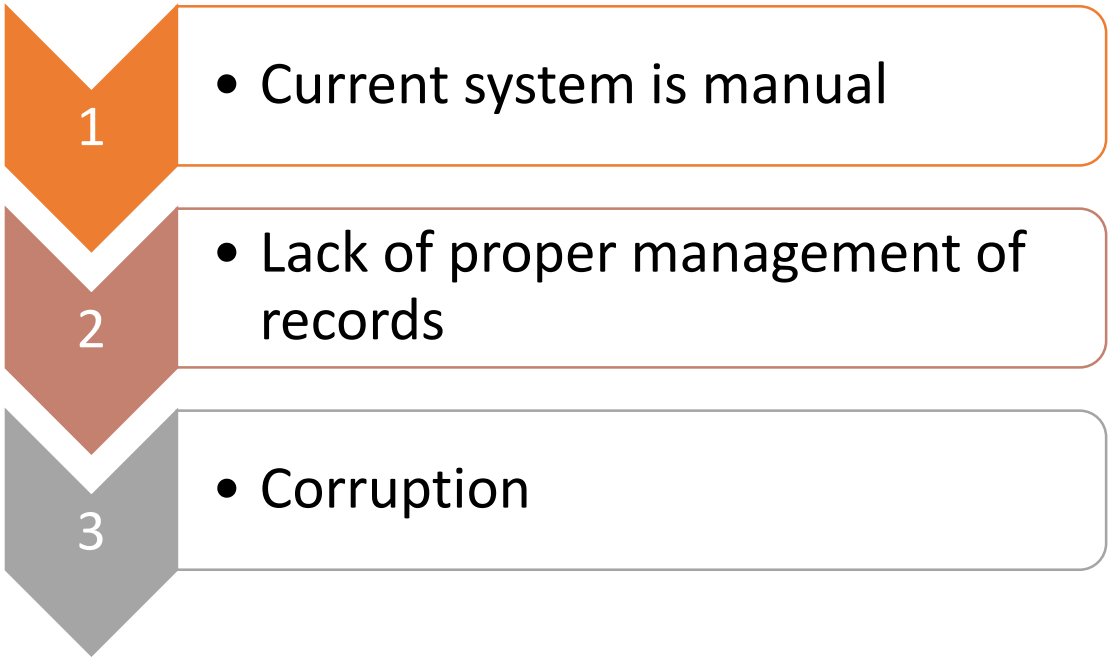

Fig 2: Problem Definition

2.3. Need for Project

According to Govt. of India estimates, 1200 accidents take place in India everyday which results in unfortunate deaths of many innocents souls. Most of the accidents take place due to rash and negligent driving which is the result of poor monitoring of offenders, lack of proper mechanisms for real-time data availability for police, fake license and poor fine imposition and corruption by repeated offenders.

Thus it is necessity that today law and order authorities today have a system that not only can be effective in maintenance but allows proper implementation on rules and imposition of fines which is followed after breaking of any rules.

Also the modern government must have a system in governance which promotes transparency among its populace.

3. Analysis & Design

3.1. Software Development

Below are the steps involved in the System Development. Each phase within the overall cycle may be made up of several steps.

Step 1: Software Concept

The first step is to identify a need for the new system. This will include determining whether a business problem or opportunity exists, conducting a feasibility study to determine if the proposed solution is cost effective, and developing a project plan.

This process may involve end users who come up with an idea for improving their work. Ideally, the process occurs in tandem with a review of the organization's strategic plan to ensure that IT is being used to help the organization achieve its strategic objectives. Management may need to approve concept ideas before any money is budgeted for its development.

Step 2: Requirements Analysis

Requirements analysis is the process of analyzing the information needs of the end users, the organizational environment, and any system presently being used, developing the functional requirements of a system that can meet the needs of the users. Also, the requirements should be recorded in a document, email, user interface storyboard, executable prototype, or some other form. The requirements documentation should be referred to throughout the rest of the system development process to ensure the developing project aligns with user needs and requirements.

Professionals must involve end users in this process to ensure that the new system will function adequately and meets their needs and expectations.

Step 3: Architectural Design

After the requirements have been determined, the necessary specifications for the hardware, software, people, and data resources, and the information products that will satisfy the functional requirements of the proposed system

can be determined. The design will serve as a blueprint for the system and helps detect problems before these errors or problems are built into the final system. Professionals create the system design, but must review their work with the users to ensure the design meets users' needs.

Step 4: Coding and Debugging

Coding and debugging is the act of creating the final system. This step is done by software developer.

Step 5: System Testing

The system must be tested to evaluate its actual functionality in relation to expected or intended functionality. Some other issues to consider during this stage would be converting old data into the new system and training employees to use the new system. End users will be key in determining whether the developed system meets the intended requirements, and the extent to which the system is actually used.

Step 6: Maintenance

Inevitably the system will need maintenance. Software will definitely undergo change once it is delivered to the customer. There are many reasons for the change. Change could happen because of some unexpected input values into the system. In addition, the changes in the system could directly affect the software operations. The software should be developed to accommodate changes that could happen during the post implementation period.

There are various software process models like:-

- Prototyping Model
- RAD Model
- The Spiral Model
- The Waterfall Model
- The Iterative Model

3.2.Flow of Project

3.2.1. Preliminary Survey

Before we began with the implementation of our project, we had to do lot of R&D to make the implementation of our project easier. Doing this made our ideas for the project clearer and helped us to solve the doubts which we had for the implementation of our project. Doing this also helped us during the process of developing our application without hindrances.

The project was divide into two parts:

1. Research and study.
2. Development.

Research and study

We had undertaken a project which involved z lot of research for developing the rules for decision making. We had a lot of time for research and this helped us when making the decision making rules.

Development

For the development we had decided on waterfall model which is we felt was most suitable for this project .The details of waterfall model are provided in the analysis section.

3.2.2. Feasibility Study

The very first phase in any system developing life cycle is preliminary investigation. The feasibility study is a major part of this phase. A measure of how beneficial or practical the development of any information system would be to the organization is the feasibility study.

The feasibility of the development software can be studied in terms of the following aspects:

1. Operational Feasibility.
2. Technical Feasibility.
3. Economical feasibility.

OPERATIONAL FEASIBILITY

The Application will reduce the time consumed to maintain manual records and is not tiresome and cumbersome to maintain the records. Hence operational feasibility is assured.

TECHNICAL FEASIBILITY

Minimum hardware requirements:

- 1.66 GHz Pentium Processor or Intel compatible processor.
- 1 GB RAM.
- Internet Connectivity.
- 80 MB hard disk space.

ECONOMICAL FEASIBILTY

Once the hardware and software requirements get fulfilled, there is no need for the user of our system to spend for any additional overhead.

For the user, the Application will be economically feasible in the following aspects:

- The Application will reduce a lot of labor work. Hence the Efforts will be reduced.
- Our Application will reduce the time that is wasted in manual processes.
- The storage and handling problems of the registers will be solved.

3.2.3. Cost Analysis

For a given set of requirements it is desirable to know how much it will cost to develop the software to satisfy the given requirements, and how much time development will take. These estimates are needed before development is initiated. The primary reason for cost and schedule estimation is to enable the client or developer to perform a cost-benefit analysis and for project monitoring and control. Cost in a project is due to the requirements for software, hardware and human resources. Most cost estimates are determined in terms of Person month (PM).

We have used COCOMO (Constructive Cost Model). The Intermediate COCOMO model computes software development effort as a function of program size and a set of "cost drivers" that include subjective assessments of product, hardware, personnel and project attributes. This model estimates the total effort in terms of person-months of the technical project staff. The important steps in this analysis are:

- ❖ Obtain an initial estimate of the development effort from the estimate of thousands of delivered lines of source code (KLoC)
- ■ The initial estimate (also called as nominal estimate) is determined by an equation of the form used in the static single-variable models, using KLoC as the measure of size.
- ■ To determine the initial effort Ei in person- months the equation used is,

$$Ei = a * (KLoC)\ b$$

- ■ Where, a and b are constants which are determined depending on the type of the project. Since, this project is of Windows based type, therefore the values of a = 1.40 and the value of b = 0.6 and KLoC is the number of lines of source code which is .874 KLoC. Thus the value of E_i is:

$$\mathbf{E_i} = 1.40 * (0.874) * 0.60 = 0.73416\ PM$$

- ❖ Determine a set of 15 multiplying factors from different attributes of the product which are:

Cost Drivers	Very low	Low	Normal	High	Very High
Product Attribute					
RELY, required reliability	0.75	0.88	1.00	1.15	1.40
DATA, database size		0.94	1.00	1.08	1.16
CPLX, product complexity	0.70	0.85	1.00	1.15	1.30
Computer Attribute					
TIME, execution time constraint			1.00	1.11	1.30
STOR, main storage constraint			1.00	1.06	1.21
VITR, virtual machine volatility		0.87	1.00	1.15	1.30
TURN, computer turnaround time		0.87	1.00	1.07	1.15
Personnel Attribute					
ACAP, analyst capability	1.46	1.19	1.00	0.86	0.71
AEXP, application experience	1.29	1.13	1.00	0.91	0.82
PCAP, programmer capability	1.42	1.17	1.00	0.86	0.70
VEXP, virtual machine experience	1.21	1.10	1.00	0.90	
LEXP, programming language experience	1.14	1.07	1.00	0.95	
Project Attributes					
MODP, modern programming practices	1.24	1.10	1.00	0.91	0.82

TOOL, use of SW tools	1.24	1.10	1.00	0.91	0.83
SCHED, development schedule	1.23	1.08	1.00	1.04	1.10

Fig 3: Cost Estimation Table

- ❖ Adjust the effort estimate by multiplying the initial estimate with the entire multiplying factor.

  We have taken the factors:

  - ✓ Reliability
  - ✓ Complexity
  - ✓ Time Constraints
  - ✓ Turnaround time
  - ✓ Analyst capability
  - ✓ Programmer capability
  - ✓ Programming language experience
  - ✓ Modern Programming practices
  - ✓ Use of SW tools
  - ✓ Development Schedule

Based on these factors we have calculated, Effort Adjustment Factor (EAF) as follows:

EAF = 1.15 * 0.85 * 1.00 * 0.87 * 1.00 * 1.00 * 1.07 * 1.10 * 0.91 * 1.00

= 0.91087

The final effort estimate, E is determined by multiplying the initial estimate by the EAF:

E=EAF * E_i

= 0.91087 * 0.73416

= 0.6687 Person Month

We take the assumption charges are 40 rupees per day.

Total estimation = 191 * 0.6687 * 40

= 5100 Rupees.

3.2.4. Process Model

Software process model deals with the model which we are going to use for the development of the project. There are many software process models available but while choosing it we should choose it according to the project size that is whether it is industry scale project or big scale project or medium scale project.

Accordingly the model which we choose should be suitable for the project as the software process model changes the cost of the project also changes because the steps in each software process model varies.

This software is build using the waterfall mode. This model suggests work cascading from step to step like a series of waterfalls. It consists of the following steps in the following manner

WATERFALL MODEL:-

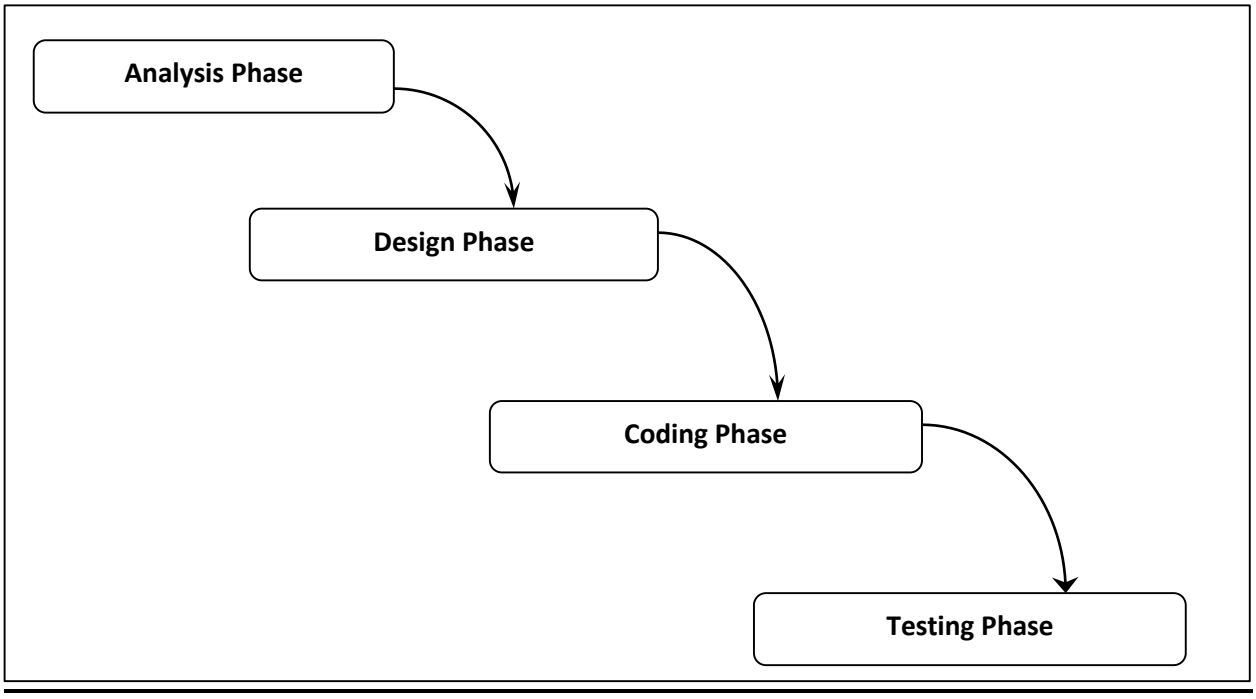

Fig 4: Waterfall Model

1. Analysis Phase:

To attack a problem by breaking it into sub-problems. The objective of analysis is to determine exactly *what* must be done to solve the problem. Typically, the system's *logical* elements (its boundaries, processes, and data) are defined during analysis.

2. Design Phase:

The objective of design is to determine *how* the problem will be solved. During design the analyst's focus shifts from the logical to the *physical*. Data elements are grouped to form physical data structures, screens, reports, files, and databases.

3. Coding Phase:

The system is created during this phase. Programs are coded, debugged, documented, and tested. New hardware is selected and ordered. Procedures are written and tested. End-user documentation is prepared. Databases and files are initialized. Users are trained.

4. Testing Phase:

Once the system is developed, it is tested to ensure that it does what it was designed to do. After the system passes its final test and any remaining problems are corrected, the system is implemented and released to the user.

All these phases are described with respect to the project in the rest of the document.

3.2.5. Data Flow Diagrams

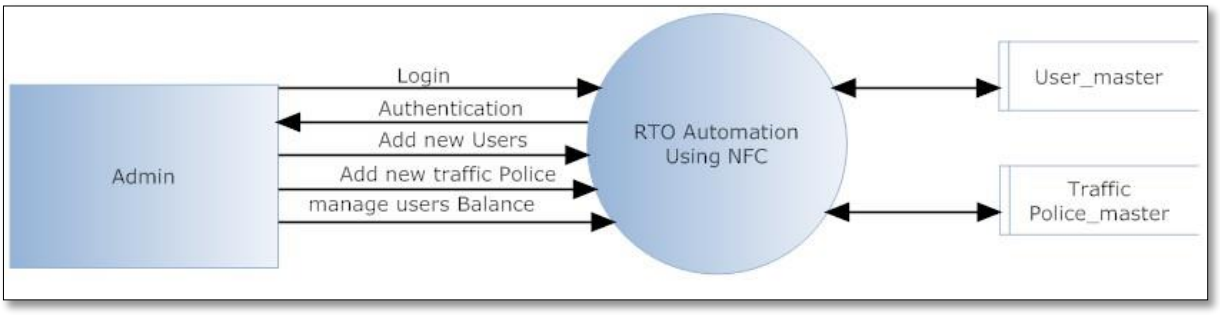

Fig 5: Admin module DFD

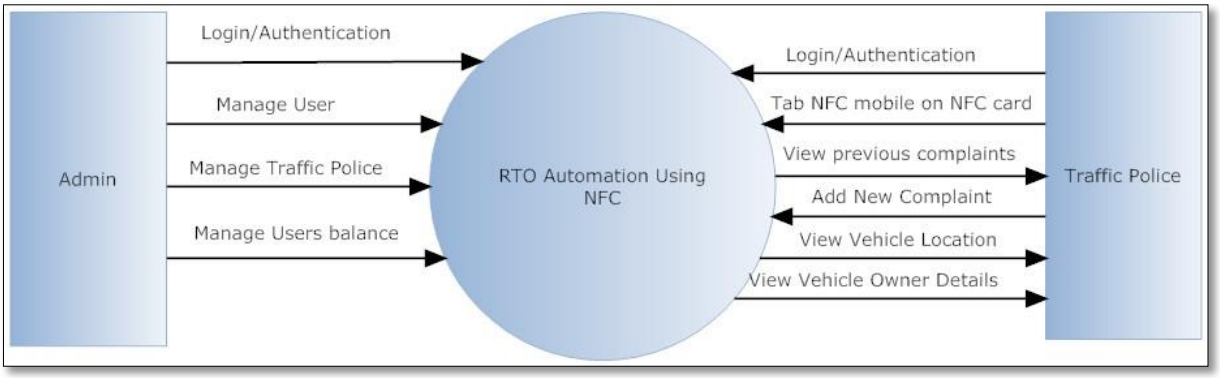

Fig 6: Context Level DFD

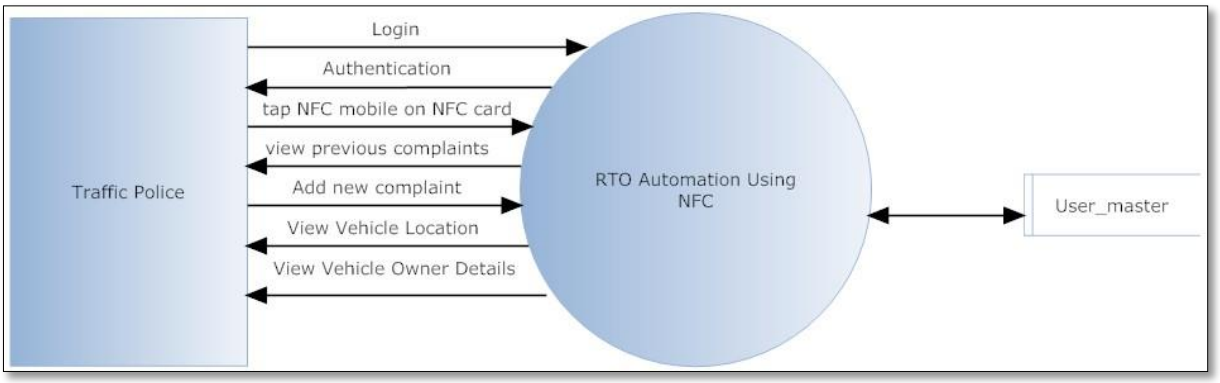

Fig 7: Traffic Police Module DFD

3.3. UML Diagrams

Use Case Diagram

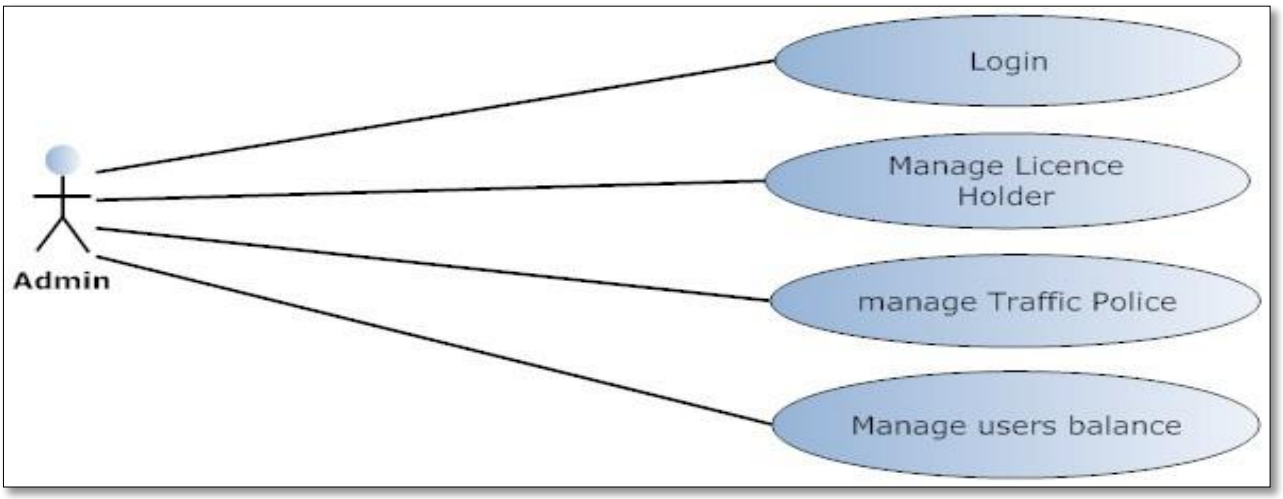

Fig 8: Admin Module Use Case Diagram

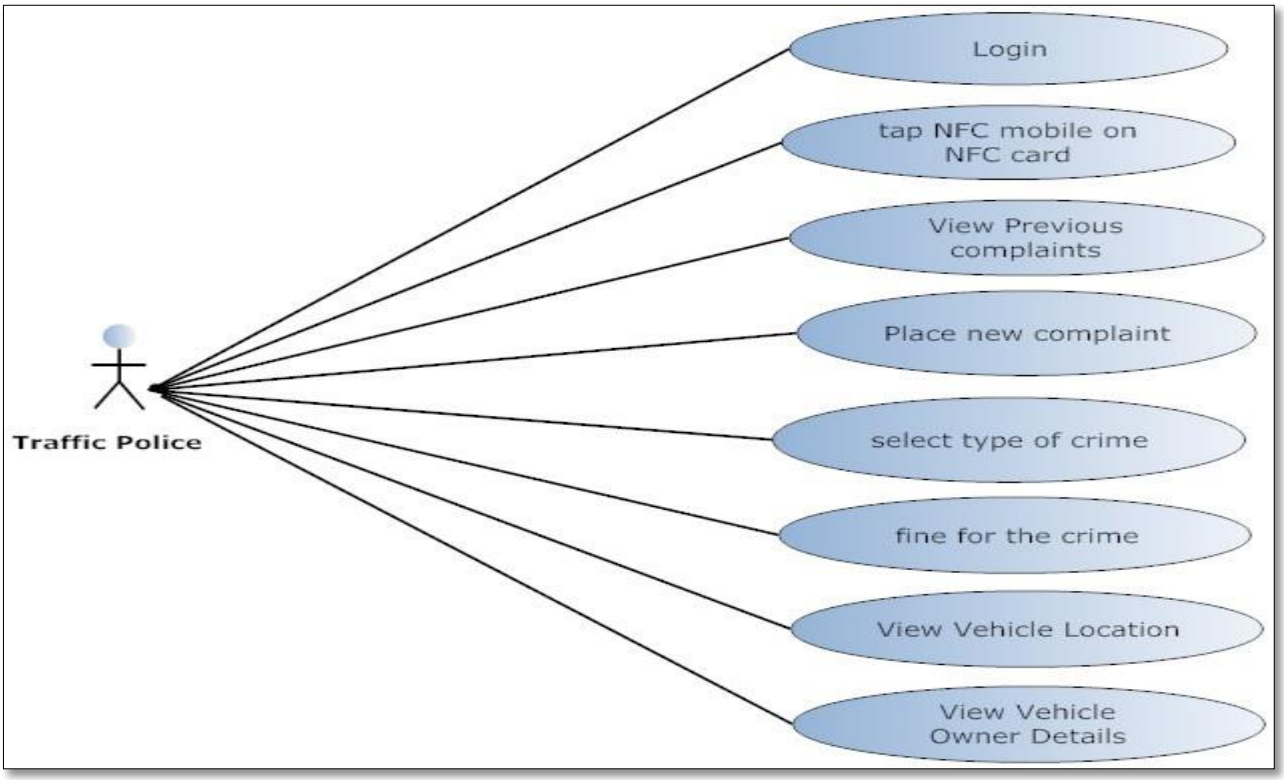

Fig 9: Traffic Police Use Case Diagram

Component Diagram

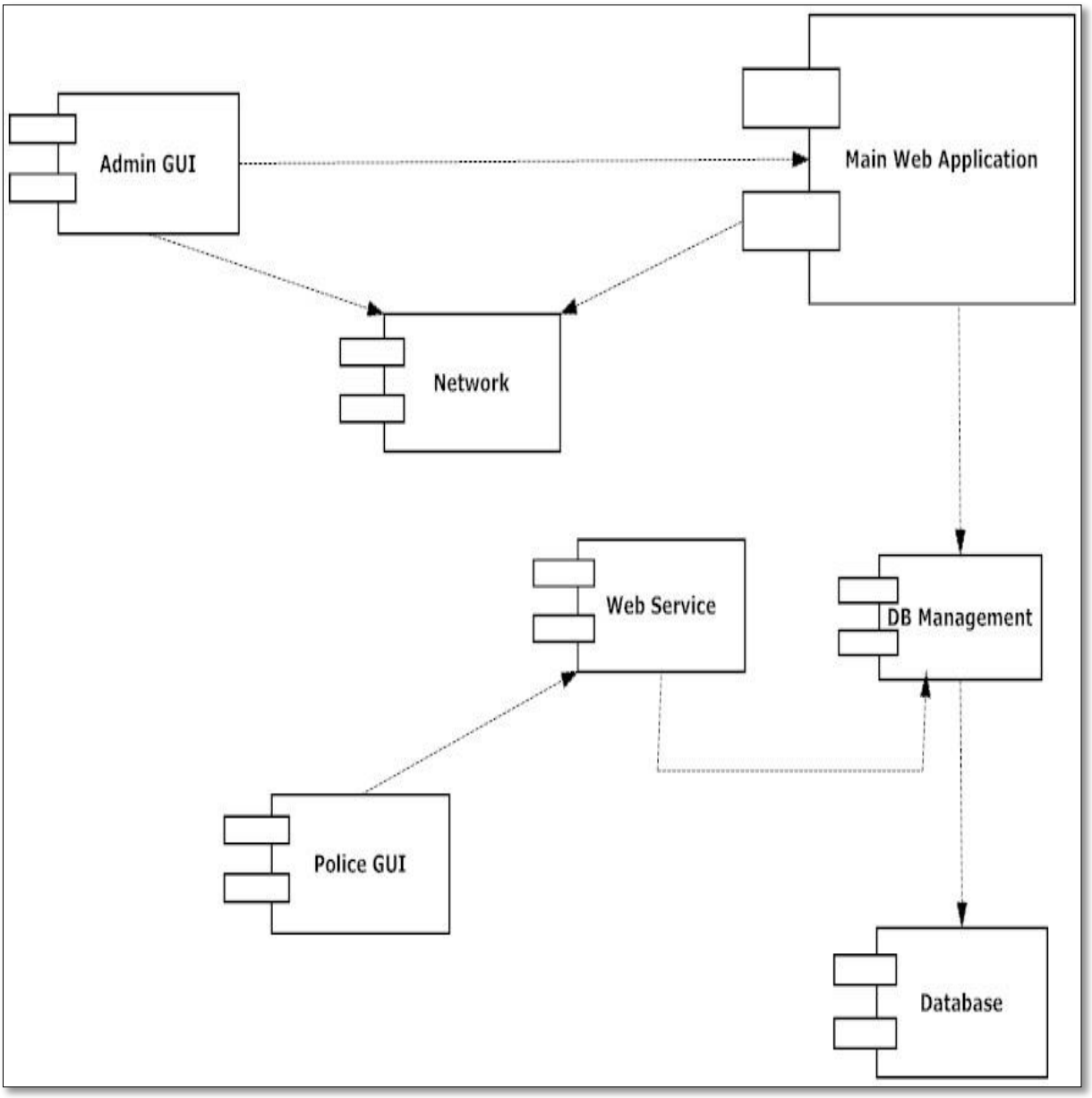

Fig 10: Component Diagram

Activity Diagram

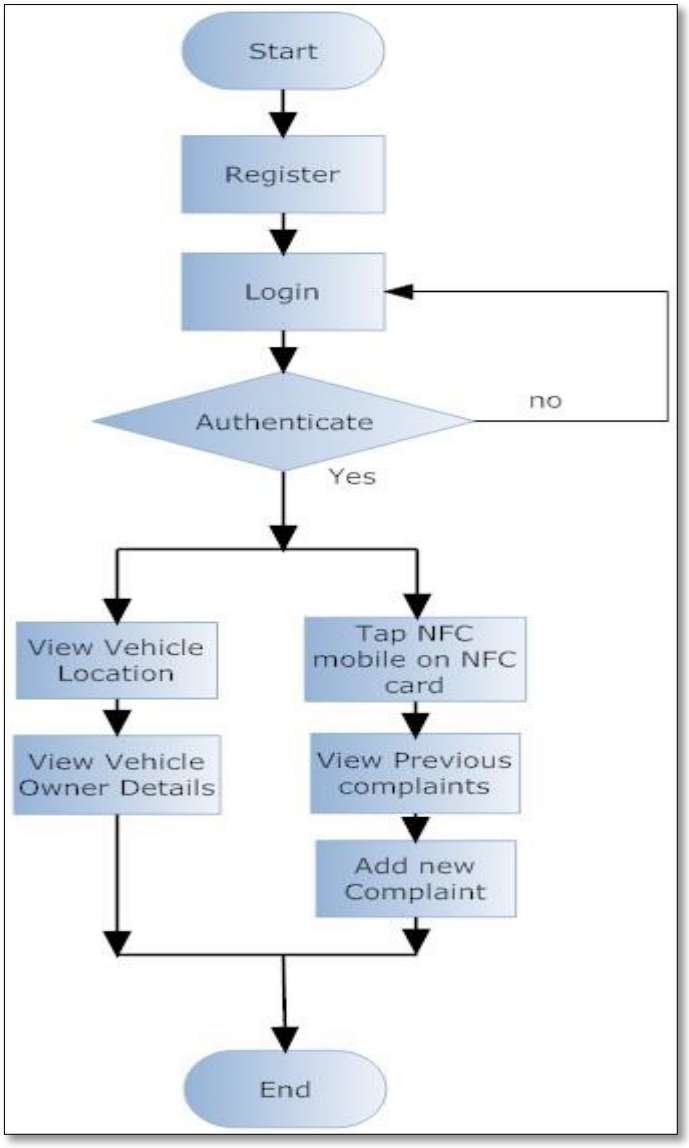

Fig 11: Activity Diagram

Sequence Diagram

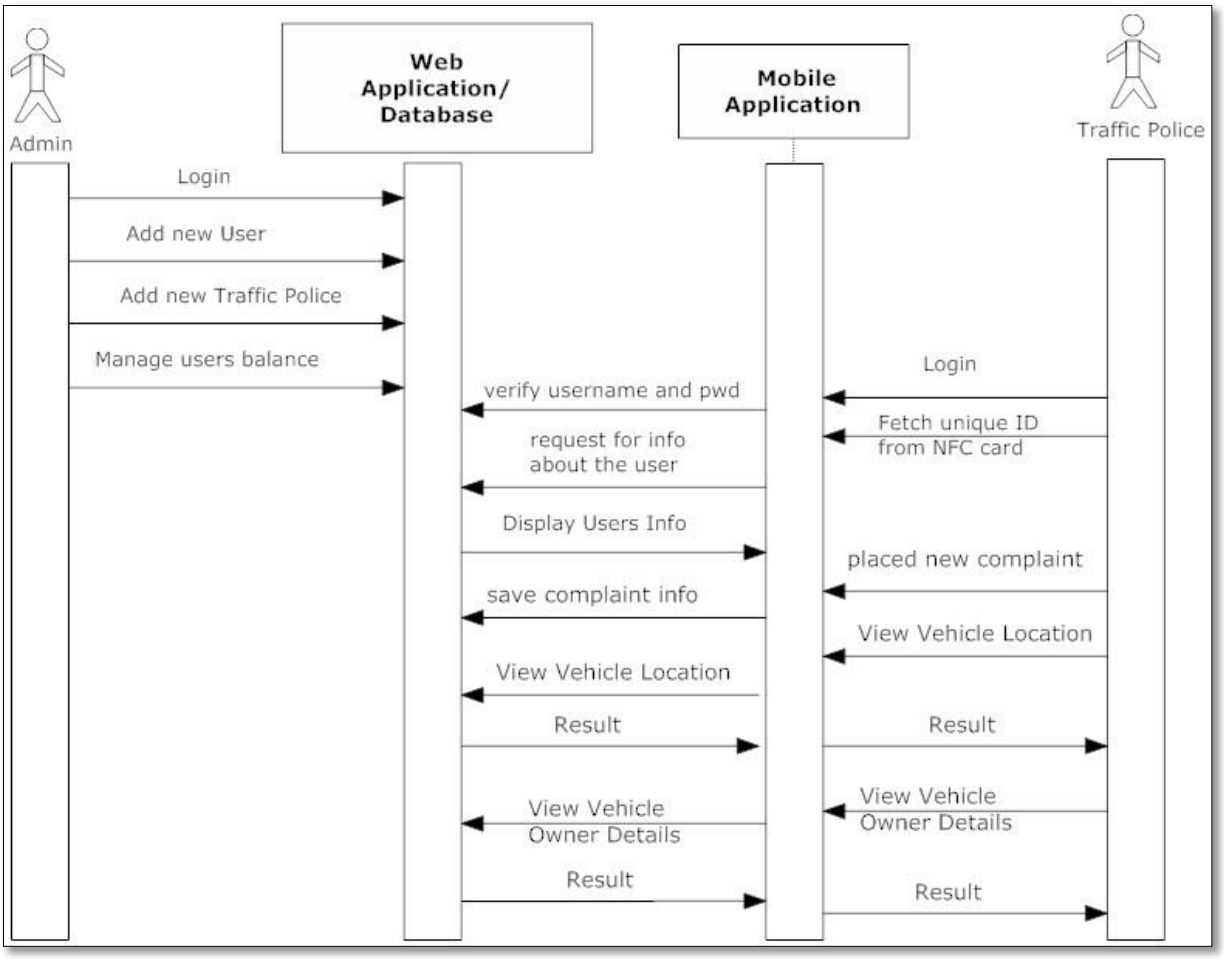

Fig 12: Sequence Diagram

3.4. Technologies Used

3.4.1. Hardware & Software Requirements

HARDWARE REQUIREMENTS:

- NFC tags
- NFC based Android Mobile
- Intel processor IV and above
- 1 GB RAM
- 160 GB hard disk

SOFTWARE REQUIREMENTS:

- Visual Studio 2010
- MS SQL Server 2008
- SDK for Android 4.2
- Windows Operating System
- Eclipse

3.4.2. Introduction to Programming Tools

- Android Studio

Android Studio is the official integrated development environment (IDE) for Android platform development.New features are expected to be rolled out with each release of Android Studio. The following features are provided in the current stable version:

- Gradle-based build support.
- Android-specific refactoring and quick fixes.
- Lint tools to catch performance, usability, version compatibility and other problems.
- ProGuard integration and app-signing capabilities.
- Template-based wizards to create common Android designs and components.
- A rich layout editor that allows users to drag-and-drop UI components, option to preview layouts on multiple screen configurations.
- Support for building Android Wear apps
- Built-in support for Google Cloud Platform, enabling integration with Google Cloud Messaging and App Engine

- NET Framework

The .NET Framework is an environment for building, deploying, and running XML Web services and other applications. It is the infrastructure for the overall .NET platform. The .NET Framework consists of three main parts: the common language runtime, the class libraries, and ASP.NET.

The common language runtime and class libraries, including Windows Forms, ADO.NET, and ASP.NET, combine to provide services and solutions that can be easily integrated within and across a variety of systems. The .NET Framework provides a fully managed, protected, and feature-rich application execution environment, simplified development and deployment, and seamless integration with a wide variety of languages.

- ASP.NET

ASP.NET is more than the next version of Active Server Pages (ASP); it is a unified Web development platform that provides the services necessary for developers to build enterprise-class Web applications. While ASP.NET is largely syntax-compatible with ASP, it also provides a new programming model and infrastructure that enables a powerful new class of applications. You can migrate your existing ASP applications by incrementally adding ASP.NET functionality to them.

ASP.NET is a compiled .NET Framework -based environment. You can author applications in any .NET Framework compatible language, including Visual Basic and Visual C#. Additionally, the entire .NET Framework platform is available to any ASP.NET application. Developers can easily access the benefits of the .NET Framework, which include a fully managed, protected, and feature-rich application execution environment, simplified development and deployment, and seamless integration with a wide variety of languages.

- Microsoft SQL Server

Business today demands a different kind of data management solution. Performance scalability, and reliability are essential, but businesses now expect more from their key IT investment.

SQL Server 2005 exceeds dependability requirements and provides innovative capabilities that increase employee effectiveness, integrate heterogeneous IT ecosystems,and maximize capital and operating budgets. SQL Server 2005 provides the enterprise data management platform your organization needs to adapt quickly in a fast changing environment. Benchmarked for

scalability, speed, and performance, SQL Server 2005 is a fully enterprise-class database product, providing core support for Extensible Markup Language (XML) and Internet queries.

1. Easy-to-use Business Intelligence (BI) Tools

Through rich data analysis and data mining capabilities that integrate with familiar applications such as Microsoft Office, SQL Server 2005 enables you to provide all of your employees with critical, timely business information tailored to their specific information needs. Every copy of SQL Server 2005 ships with a suite of BI services.

2. Self-Tuning and Management Capabilities

Revolutionary self-tuning and dynamic self-configuring features optimize database performance, while management tools automate standard activities. Graphical tools and performance, wizards simplify setup, database design, and performance monitoring, allowing database administrators to focus on meeting strategic business needs.

3. Data Management Application and Services

Unlike its competitors, SQL Server 2005 provides a powerful and comprehensive data management platform. Every software license includes extensive management and development tools, a powerful extraction, transformation, and loading (ETL) tool, business intelligence and analysis services, and analysis service, and such as Notification Service. The result is the best overall business value available.

Enterprise Edition includes the complete set of SQL Server data management and analysis features are and is uniquely characterized by several features that makes it the most scalable and available edition of SQL Server 2005 .It scales to the performance levels required to support the largest Web sites, Enterprise Online Transaction Processing (OLTP) system and Data Warehousing systems. Its support for failover clustering also makes it ideal for any mission critical line-of-business application. Additionally, this edition includes several advanced analysis features that are not included in SQL Server 2005 Standard Edition.

4. Project Time & Task Distribution

4.1. Timeline Chart

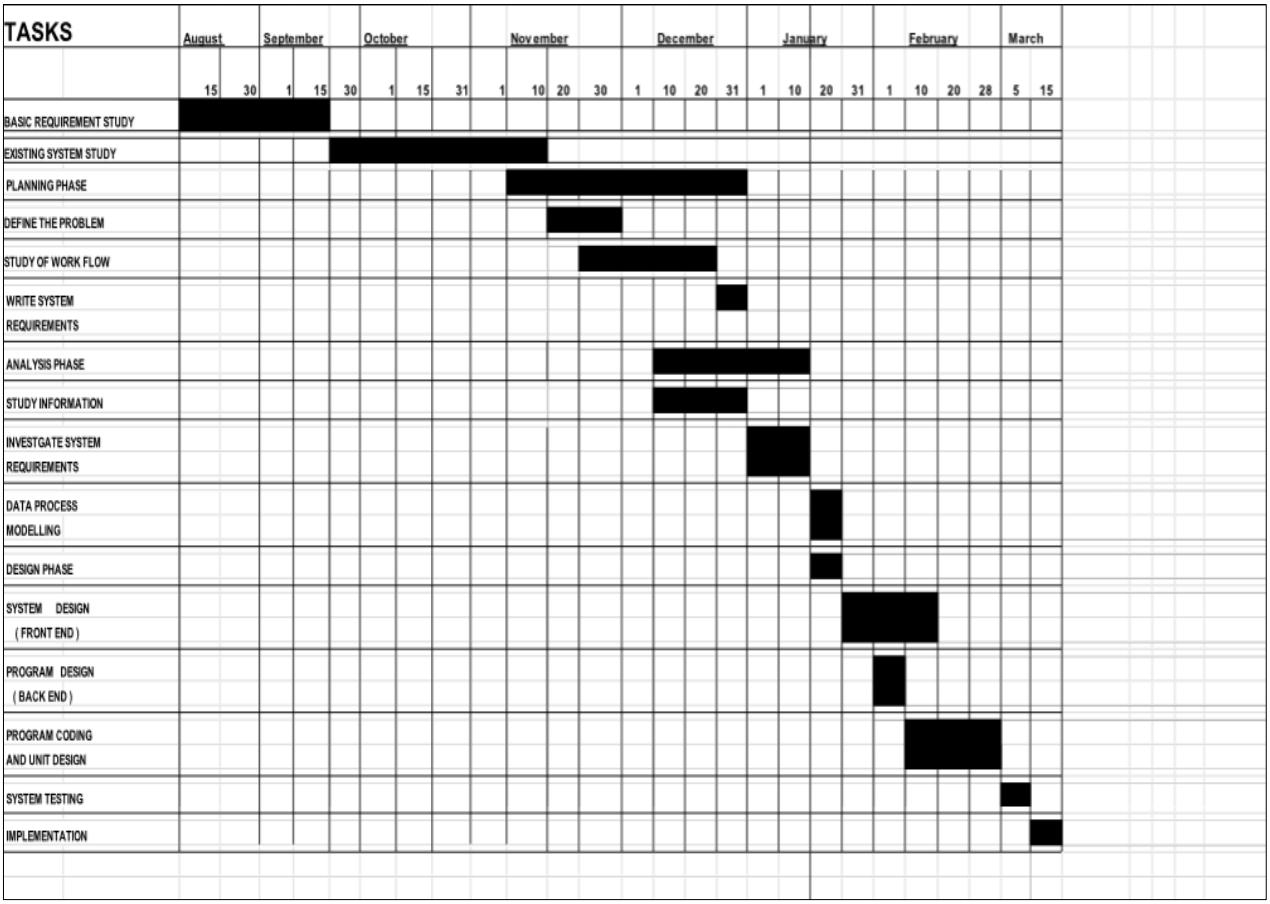

Fig 13: Gantt chart

5. Implementation

Code for Implementation of reading NFC

```
public class SwipeNFC_Card extends Activity {
Dialog dg;
int resp;
Context context;
private NfcAdapter mNfCAdapter;
boolean isNFCReadFlag=false;
boolean isHandleIntent=false;
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_swipe_nfc__card);
TextView txtpolicename=(TextView)findViewById(R.id.textView2);
TextView txtpoliceid=(TextView)findViewById(R.id.textView4);
String policename=policedetails_request.GetPoliceName();
if(policename==null)
{
Jump();
}
txtpolicename.setText(policedetails_request.GetPoliceName());
txtpoliceid.setText(policedetails_request.GetPoliceId());
/*if(policedetails_request.GetPoliceName().equals(null))
{
Intent intent=new Intent(SwipeNFC_Card.this,Login.class);
startActivity(intent);
}
else
{*/
/*mNfCAdapter=NfcAdapter.getDefaultAdapter(this);
if(mNfCAdapter==null)
{
Toast.makeText(getApplicationContext(), "This device does not support NFC.",
Toast.LENGTH_SHORT).show();
finish();
```

```
return;
}
if (!mNfCAdapter.isEnabled())
{
AlertDialog dialog=new AlertDialog.Builder(context).create();
dialog.setMessage("NFC Disabled! Please enable NFC before proceeding.");
dialog.show();
}
else
{*/
handleIntent(getIntent());
//}
Button btnnext=(Button)findViewById(R.id.button1);
btnnext.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
selelctuserdetails();
}
});
Button btnlogout=(Button)findViewById(R.id.button2);
btnlogout.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
Intent intent=new Intent(SwipeNFC_Card.this,CarLocation.class);
startActivity(intent);
}
});
//}
}
```

Code for Implementation of Penalty History Webpage

```
<!-- penalty history details -->
<%@ Page Language="C#" AutoEventWireup="true" CodeFile="UserPenaltyDetails.aspx.cs"
Inherits="UserPenaltyDetails" %>
```

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html>
<head id="Head1" runat="server">
    <title>RTO Automation</title>
    <meta name="description" content="website description" />
    <meta name="keywords" content="website keywords, website keywords" />
    <meta http-equiv="content-type" content="text/html; charset=windows-1252" />
    <link rel="stylesheet" type="text/css" href="css/style.css" />
    <!-- modernizr enables HTML5 elements and feature detects -->
    <script type="text/javascript" src="js/modernizr-1.5.min.js"></script>
    </head>
<body>
    <form id="form1" runat="server">
    <div id="main" align="center">
        <div id="site_content">
            <div id="content">
                <div class="content_item">
                    <h1>
                        Penalty Details</h1>
                    <table>
                        <%--<tr>
                            <td>
                                <h3>
                                    <a href="Add_new_User.aspx">Add New User</a></h3>
                            </td>
                        </tr>--%>
                        <tr>
                            <td>
                                <h3>
                                <a href="UserLogin.aspx"> Logout </a>
                                </h3>
                            </td>
                        </tr>
```

```
                </table>
                <asp:GridView ID="GridView1" runat="server"
                    Width="874px">

                </asp:GridView>
            </div>
            <!--close content_item-->
        </div>
        <!--close content-->
    </div>
    <!--close site_content-->
</div>
<!--close main-->
<!-- javascript at the bottom for fast page loading -->
<script type="text/javascript" src="js/jquery.js"></script>
<script type="text/javascript" src="js/image_slide.js"></script>
</form>
</body>
</html>
```

6. Test Cases

6.1. Graphical User Interface

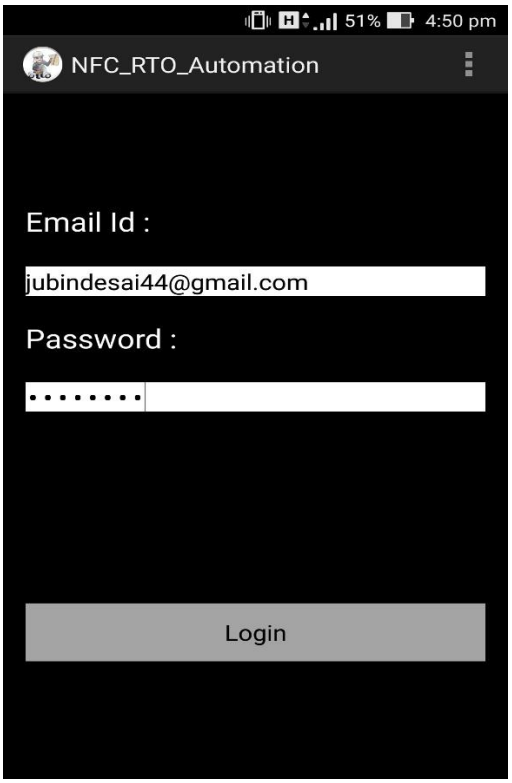

Fig 14: Android app login page

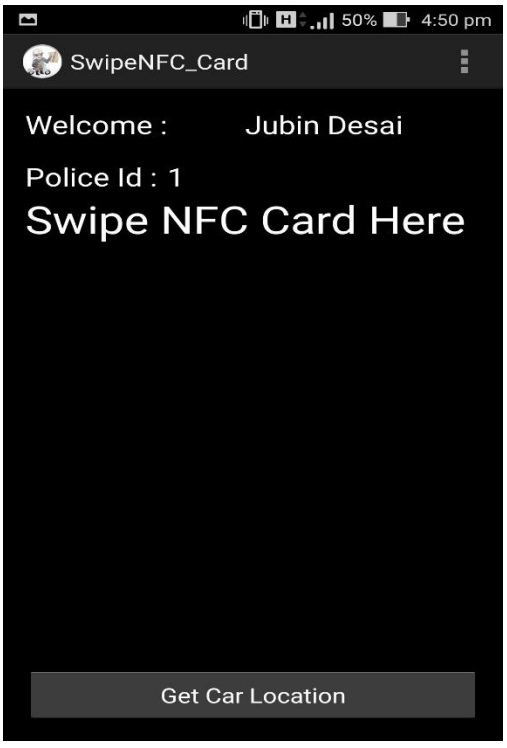

Fig 15: NFC swipe page

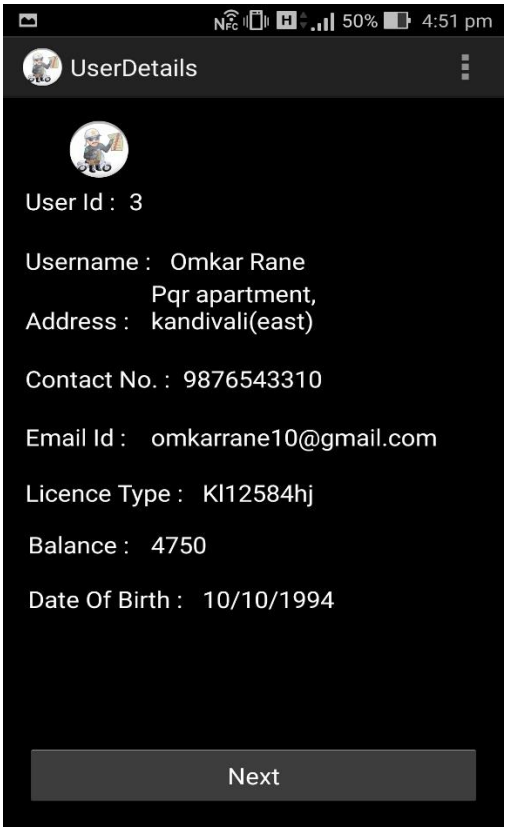

Fig 16: License owner detail page

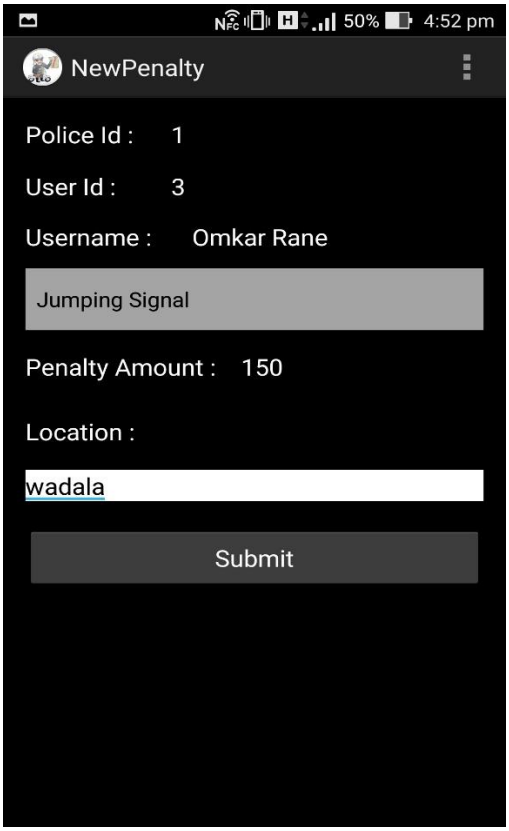

Fig 17: New penalty entry page

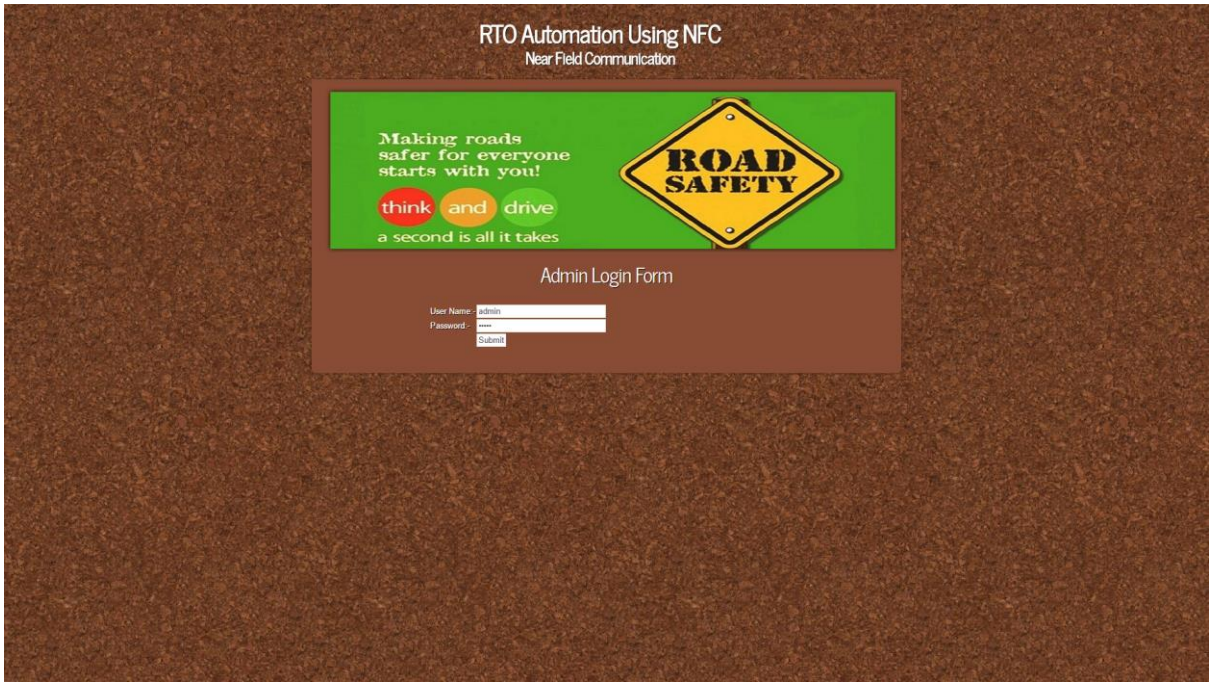

Fig 18: Admin login page

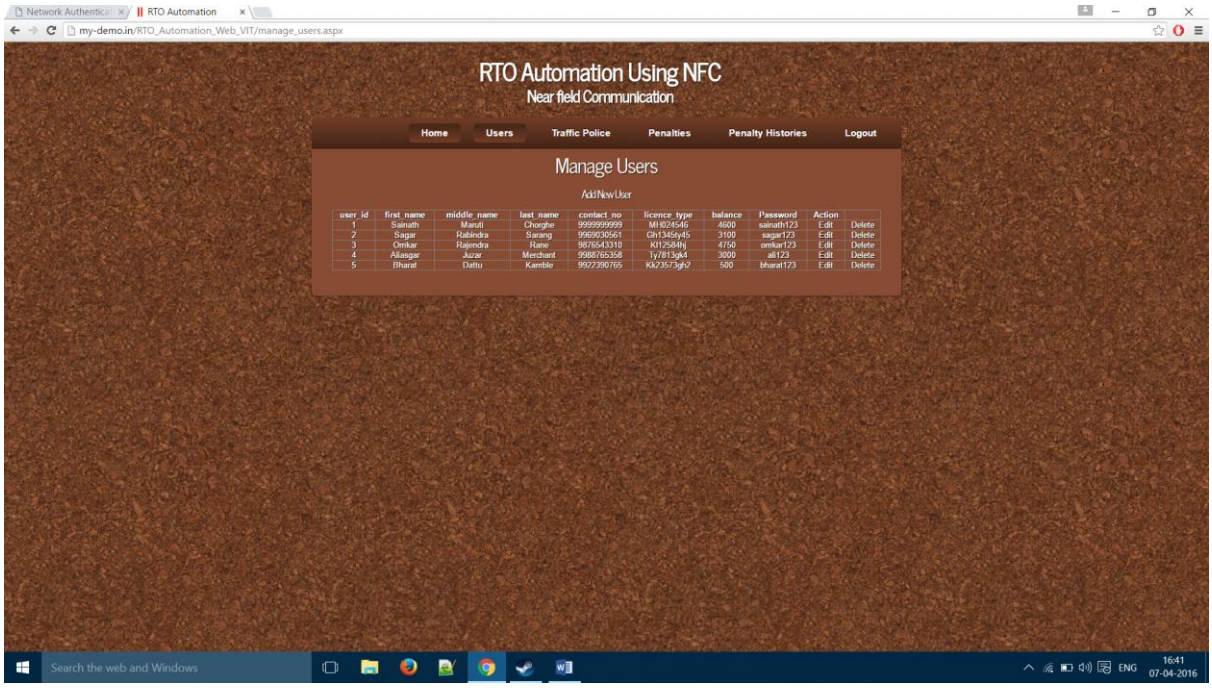

Fig 19: Manage User (Admin)

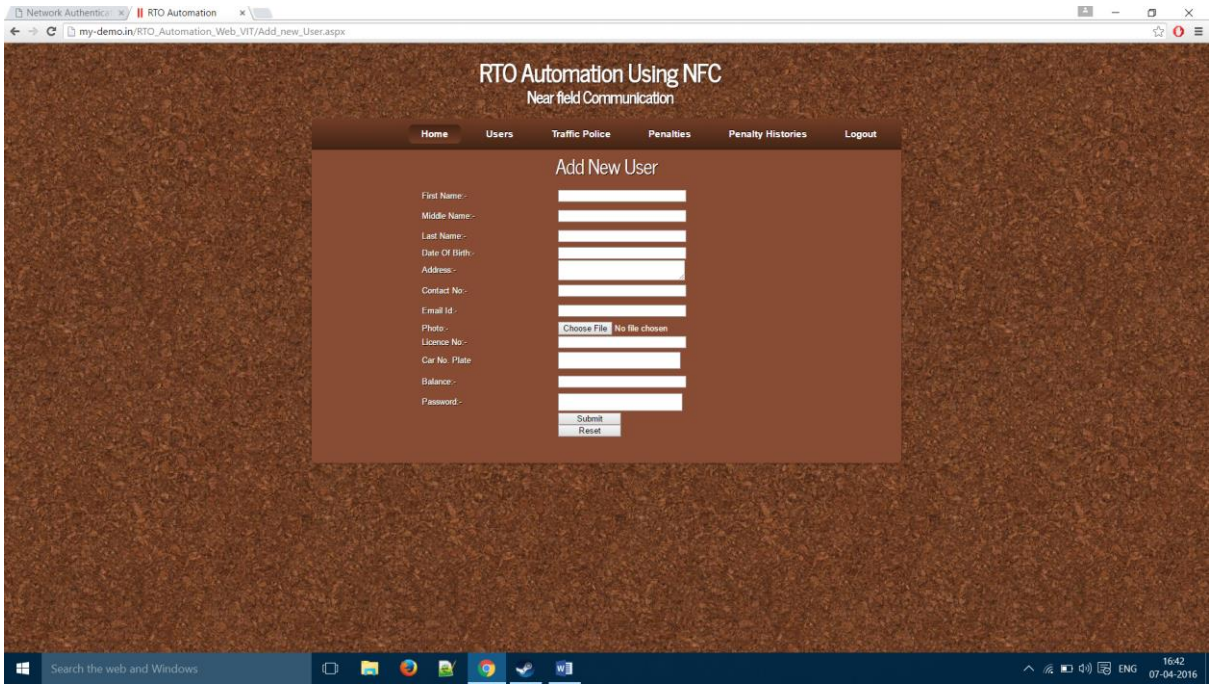

Fig 20: Add user (Admin)

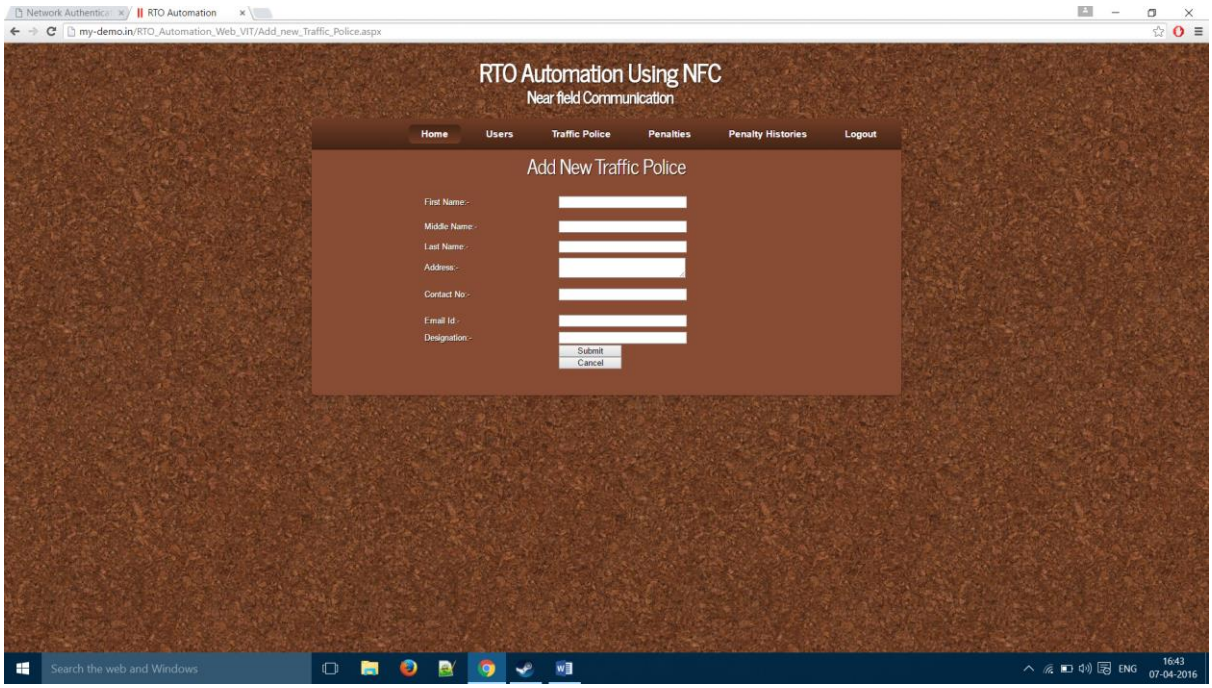

Fig 21: Add Traffic Police (admin)

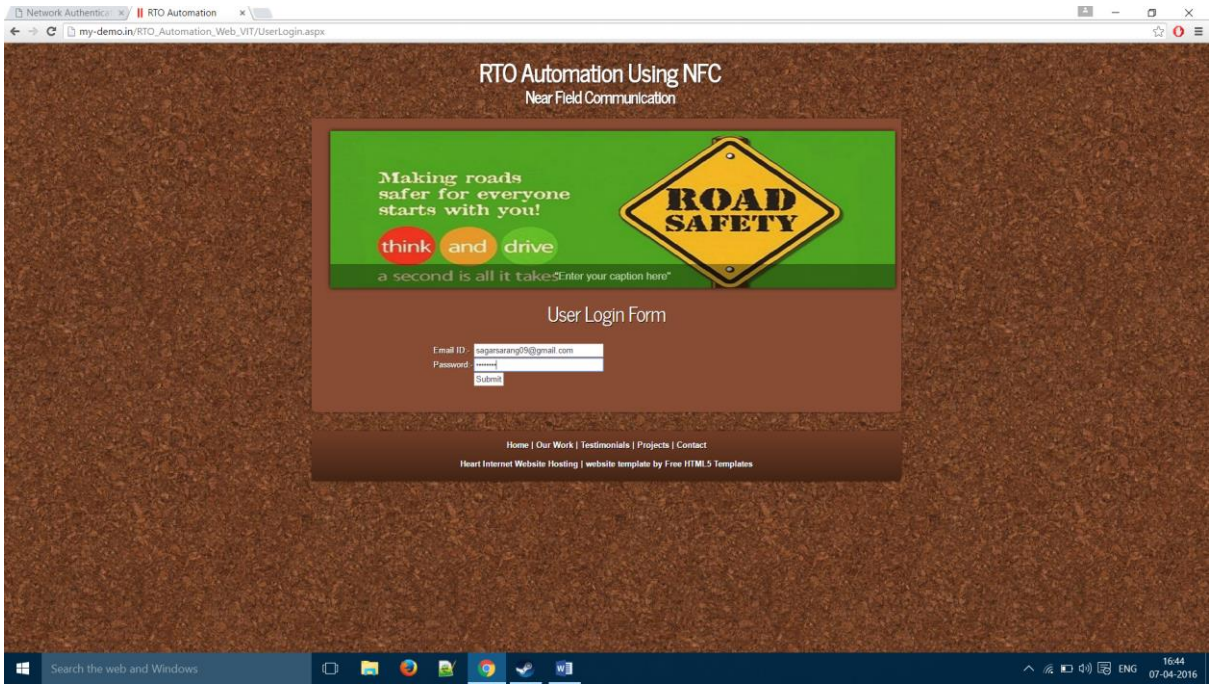

Fig 22: User Login Page

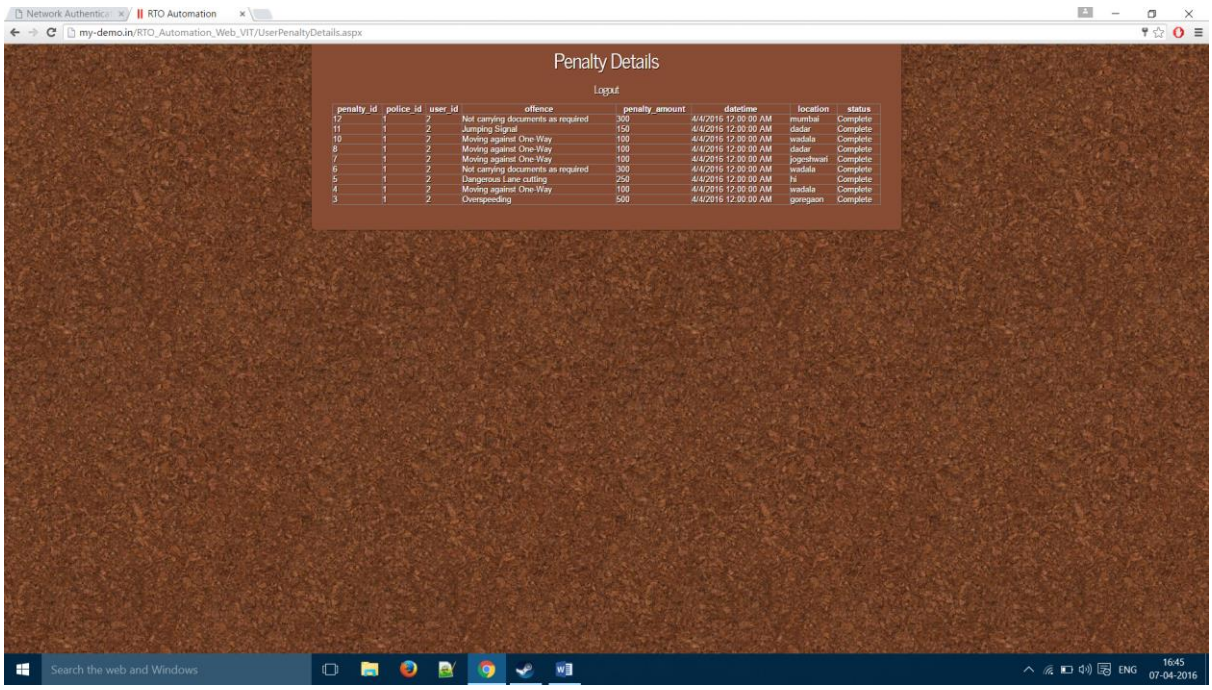

Fig 23: User Home Page

6.2. Test Cases

Test Case Id: 01

Test Objective: To test the Login Module for the admin login and user login page.

Item No	Test Condition	Operator Action	Input Specification	Output Specification (Expected Results)	Pass or Fail
1	Successful Login.	1. Insert Username and Password. 2. Press Submit button.	Username and Password	1. System validates the User ID and Password and depending on the user/admin provides the Info for admin/user	Pass
2	Unsuccessful Login due to Incorrect password.	1. Insert Username and Password. 2. Press Submit button.	user ID/email and Password	1. System validates the user ID/email and Password and Pops up message "Invalid User ID or password".	Pass
3	Unsuccessful Login due to Blank Text boxes.	1. Press the Submit button.	Null Values	1. System checks that text boxes are empty shows the message: "Email id/password required".	Pass
4	Entering numbers in First name/Last name in add users/add police	1. Move to the next field.	First name/Last name	1. System checks the text boxes and shows the message: "Characters Only"	Pass

	in registration box	2.Press Submit button			
5	Entering Characters in Contact number or not entering 10 digits in Contact number of Police/user	1. Move to the next field. 2.Press Submit button	Contact Number	1. System checks the text box and shows the message: “Invalid Contact Number”	Pass
6	Entering Character in balance field of user.	1. Move to the next field. 2.Press Submit Button	Balance	1.System checks the text box and shows the message: “Integer Only”	Pass

Fig 24: Website test case table

Test Case Id: 02.

Test Objective: To test the Android App (.apk) module

Item No	Test Condition	Operator Action	Input Specification	Output Specification(Expected Results)	Pass or Fail
1	Successful Login.	1. Insert Username/email and Password. 2. Press Login button.	Username and Password	1. App validates the User Id and Password and depending on the user/admin provides the Info for admin/user	Pass
2	Unsuccessful Login due to Incorrect password.	1. Insert Username/Email and Password. 2. Press Login button.	User Id/email and Password	1. System validates the User Id/email and Password and Pops up message "Invalid User ID or password".	Pass
3	Unsuccessful Login due to Blank Text boxes.	1. Press the Login button.	Null Values	1. System checks that text boxes are empty shows the message: "All Fields are mandatory".	Pass
4	Successful NFC based License validation	Tap license to NFC based smart phone having	Null values	Details of license owner in text format	Pass

		RTOAutomation app			
5	Unsuccessful New Penalty Registration	1. No Internet Connection 2. Press Submit Button	Null values	System checks that text boxes are empty shows the message: "Location is mandatory".	Pass

Fig 25: android application test case table

7. Conclusion & Future Scope

Our entire effort for developing this project is to make Indian traffic management system more automated which will help save precious lives on road and bring traffic offenders to justice. This project was designed keeping in mind Digital India Concept of Govt. of India

This project will also help in E-Governance and promote accountability and transparency in government machinery.

Our aim is to make this system the future of all traffic law and order and traffic management system.

This system can be in future synchronized with CCTV cameras on the traffic signal for maintaining law and order and managing the traffic.

Appendix A: User Manual

1. Eclipse:

Development of Android Application mainly consist of following Packages.

1. Activities: An *activity* represents the visual representation of an Android application. *Activities* use *views*, i.e. user interface widgets as for example buttons and *fragments* to create the user interface and to interact with the user.An Android application can have several *activities*.

2. Fragments: Fragments are components which run in the context of an activity.

3. Views and layout manager: *Views* are user interface widgets, e.g. buttons or text fields.

4. Device configuration specific layouts: The user interface for *Activities* is typically defined via XML files (layout files).

5. Content providers: A *content provider* provides a structured interface to application data. Via *content provider* your application can share data with other applications. Android contains a SQLite database which is frequently used in conjunction with a *content provider*. The SQLite database would store the data, which would be accessed via the *content provider.*

6. Services: *Services* perform tasks without providing a user interface. They can communicate with other Android components and notify the user via the notification framework in Android.

7. Intents: *Intents* are asynchronous messages which allow the application to request functionality from other Android components, e.g. From *services* or *activities.* An application can call a component directly (*explicit Intent*) or ask the Android system to evaluate registered components based on the *intent* data (*implicit intents*). For example the application could implement sharing of data via an *intent* and all components which allow sharing of data would be available for the user to select. Applications register themselves to an *intent* via an *intent filter*. *Intents* allow an Android application to start and to interact with components from other Android applications.

2. Android Development Kit (SDK):

The *Android Software Development Kit* (SDK) contains the necessary tools to create, compile and package Android application. Most of these tools are command line based. The Android SDK also provides an Android device emulator, so that Android applications can be tested without a real Android phone. You can create *Android virtual devices* (AVD) via the Android SDK, which run in this emulator. The Android SDK contains the *Android debug bridge* (adb) tool which allows to connect to a virtual or real android device.

3. Android Development Tools:

Google provides the *Android Development Tools* (ADT) to develop Android applications with Eclipse. ADT is a set of components (plug-ins) which extend the Eclipse IDE with Android development capabilities.ADT contains all required functionalities to create, compile, debug and deploy Android applications from the Eclipse IDE. ADT also allows to create and start AVDs.The Android Development Tools (ADT) provides specialized editors for resources files, e.g. layout files. These editors allow to switch between the XML representation of the file and a richer user interface via tabs on the bottom of the editor.

4. Dalvik Virtual Machine:

The Android system uses a special virtual machine, i.e. the *Dalvik Virtual Machine* to run Java based applications. Dalvik uses an own bytecode format which is different from Java bytecode. Therefore you cannot directly run Java class files on Android, they need to get converted in the Dalvik bytecode format.

Appendix B: Classes & External Libraries

Visual Studio:

The Visual Studio 2010 IDE was redesigned which, according to Microsoft, clears the UI organization and "reduces clutter and complexity." The new IDE better supports multiple document windows and floating tool windows, while offering better multi-monitor support. The IDE shell has been rewritten using the Windows Presentation Foundation (WPF), whereas the internals have been redesigned using Managed Extensibility Framework (MEF) that offers more extensibility points than previous versions of the IDE that enabled add-ins to modify the behavior of the IDE. The new multi-paradigm ML-variant F# forms part of Visual Studio 2010.

Visual Studio 2010 comes with .NET Framework 4 and supports developing applications targeting Windows 7.It supports IBM DB2 and Oracle databases, in addition to Microsoft SQL Server. It has integrated support for developing Microsoft Silverlight applications, including an interactive designer. Visual Studio 2010 offers several tools to make parallel programming simpler: in addition to the Parallel Extensions for the .NET Framework and the Parallel Patterns Library for native code, Visual Studio 2010 includes tools for debugging parallel applications. The new tools allow the visualization of parallel Tasks and their runtime stacks.[101] Tools for profiling parallel applications can be used for visualization of thread wait-times and thread migrations across processor cores. Intel and Microsoft have jointly pledged support for a new Concurrency Runtime in Visual Studio 2010 and Intel has launched parallelism support in Parallel Studio as an add-on for Visual Studio.

Appendix C: Input & Output for Test Cases

We have tested the system under various conditions like in low internet connectivity in some remote part of the highway.

Often it may happen that the system may fail if there is lack of proper connectivity due to poor internet connection.

In such cases it is necessary for the user to make sure that connectivity is minimally present in order for android app to communicate with the server for the data.

The test cases for the website and android app are described in table 24 and table 25 respectively

Bibliography

Papers

[1] Shristi Singh and Sakshi Nigam, Touch and Go" With Near Field Communication: A Review,AEICT-2014

[2] Hussein Ahmad Al-Ofeishat, Mohammad A.A.Al Rababah, Near Field Communication (NFC), IJCSNS International

Journal Of Computer Science And Network Security, VOL.12 No.2, February 2012

[3] Ajay Gore1, Nirvedh Meshram2, Sumit Gadi 3, Rahul Raghatate4,Design of an Automatic Fare Collection System

Using Near Field Communication with Focus on Indian Metrorail,International Journal of Engineering Research and

Development Volume 10, Issue 4 (April 2014), PP.20-24

[4] Huda Ubaya, Design of Prototype Payment Application System with near Field Communication (NFC) Technology

based on Android,Computer Engineering and Applications Vol. 1, No. 1, June 2012

Website

1. www.google.com

2. www.qoura.com

3. www.wikipedia.com

4. www.tutorialspoint.com

5. www.microsoft.com

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