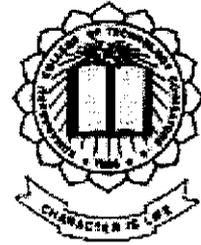


P-2709



RaTas – Road and Transport Automation Suite

Permit Module

By

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Register Number: 71206621020

Of

**KUMARAGURU COLLEGE OF TECHNOLOGY
COIMBATORE**



A PROJECT REPORT

Submitted to the

FACULTY OF INFORMATION AND COMMUNICATION ENGINEERING

In partial fulfillment of the requirements

for the award of the degree

Of

MASTER OF COMPUTER APPLICATIONS

ANNA UNIVERSITY

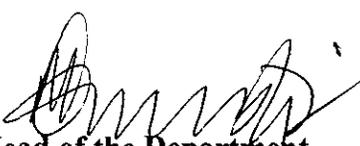
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July 2009

KUMARAGURU COLLEGE OF TECHNOLOGY**COIMBATORE - 641006****BONAFIDE CERTIFICATE**

Certified that this project report titled “**RaTas – Road and Transport Automation Suite**” is the bonafide work of “**Mr. Kandeepan. T**” (Register Number: **71206621020**) who carried out the research under my supervision. Certified further, that to the best of my knowledge the work reported herein does not form part of any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.


Supervisor


Head of the Department

Submitted to Project and Viva Examination held on 05-07-2009


Internal Examiner


External Examiner

Date: 04.06.2009

CERTIFICATE

This is to certify that, **Mr. T.Kandeepan, III M.C.A, Reg No: 71206621020** Student of **Kumaraguru College of Technology, Coimbatore** has successfully completed his project work, titled **RaTaS – Road and Transport Automation Suite – Permit Module** as part of his course curriculum.

He has done the project using **Struts2** during the period of **18-12-2008 to 03-06-2009**. He has completed the assigned project well within the time frame. He was sincere, hardworking and his conduct during the project was commendable.

We wish him all the best in his future endeavors.

For Bannari Amman Research Consultants:


(Partner)

(V.Govindaraju)

ACKNOWLEDGEMENT

First and foremost I thank God for his good will and blessings showered on me throughout the project. The success of this project needs cooperation and encouragement from different quarters. Words are inadequate to express my profound and deep sense of gratitude to those who helped me in bringing out this project successfully.

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I would express heartfelt thanks to our course coordinator **Dr.A.Muthukumar,PhD**, Professor, Kumaraguru College of Technology for his untiring work to successfully complete this project.

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ABSTRACT

The project “**ROAD AND TRANSPORT AUTOMATION SUITE – PERMIT MODULE**” is a web-based application developed for Regional Transport Offices across TamilNadu. The objective of this project is to provide all permit related tasks of a district to be done at a single RTO zone.

RaTas permit module is for processing all transactions related to vehicle permit. Permit is an instrument issued by a state or Regional Transport Authority authorizing the use of a motor vehicle Act and rules framed their under section 66 of motor vehicle act, 1988 mandates for necessity of permit to vehicles. However, transport vehicles belonging to central or state government, police and local body, fire brigade, cranes and goods vehicle having gross vehicle weight not exceeding 3000 kg are exempted from the necessity of permit. RaTas consists of a database which contains data of all vehicles belonging to an RTO. Each vehicle’s data are divided into groups and subgroups so that they are organized in a form that serves right.

Operations related to vehicle permit in an RTO are issue, renew, replace and cancel permit, temporary permit, transfer of permit, change of address in permit, recording theft vehicle and entry for black listed vehicle. Every operation is carried out through internet such as reading and processing client details by considering address, name and age proof, calculating tax and fee, issue of printed documents etc.

The software will take care of all these parameters based on input given by the user and processed documents will be printed and given to the client. This Project will be very useful for Road and Transport Department to give efficient service to Citizens and maintaining vehicle information system effectively.

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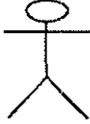
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LIST OF SYMBOLS

SYMBOL	MEANING
	Actor
	Use case
	Relationship
	System boundary
	Object Lifeline
	Message call
	Message Return
	Self Delegation
	Activate

LIST OF ABBREVIATIONS**ACRONYMS**

RaTas

RTO

AITP

LGV

HGV

HMV

PCA

PGA

CFX

STA

PRA

AJAX

FULL FORM

Road and Transport Automation Suite

Regional Transport Office

All India tourist permit

Light goods vehicle

Heavy goods vehicle

Heavy motor vehicle

Application for goods carrier permit

Application for contract carriage permit

Application for refusal to renew a certificate of fitness

State Transport Authority

Permit renewal application

Asynchronous Java and XML

1. INTRODUCTION

1.1. Company Profile

Bannari Amman Research and Consultings

Bannari Amman Research and Consultings, based at Coimbatore, is a part of a group involved in software development & Technology Training. They have good experience in successfully executing projects for all type of customers. Bannari Amman Research and Consultings is a technology oriented company promoted by professionals with rich experience and expertise in the industry. The company is focusing on providing technical training and software development for various applications. Bannari Amman Research and Consultings also look at providing the necessary business computing systems for optimizing the total systems integration, with the help of its vast product range.

1.2. Outline of Project

RATAS – ROAD AND TRANSPORT AUTOMATION SUITE PERMIT MODULE

Permit is an instrument issued by a state or Regional Transport Authority authorizing the use of a motor vehicle Act and rules framed their under section 66 of motor vehicle act, 1988 mandates for necessity of permit to vehicles. However, transport vehicles belonging to central or state government, police and local body, fire brigade, cranes and goods vehicle having gross vehicle weight not exceeding 3000 kg are exempted from the necessity of permit.

Permit for a vehicle fall under different categories such as

- Goods Vehicle,
- Passenger Vehicles,
- Stage carriage permits,
- Temporary permits,
- Tourist permits.

Fresh Permit for a vehicle can be given after by the following sequence of operations. A citizen enters the RaTas website by specifying the user name and password. For obtaining a user account a citizen should register on this site and within 15 days he/she should furnish all the personal information specified in the registration form with original documents to authorize the account from the respective RTO zone. Till then, he could not access his account. If the account is still unauthorized after 15 days, it will be cancelled by the authorizing authority.

After entering into his account he can perform any operations related to license, registration and permit. For obtaining a fresh permit, permit type, vehicle type, state list and appointment day are required. Citizen enters all the required fields and checks the available date for appearing in the respective RTO zone. For a new vehicle without registration, permit shall be given after obtaining fresh RC. Temporary permit will be issued once for a vehicle in its life time for emergency situations.

Permit can be renewed by the permit holder on or before the expiry date. The client has to submit PRA application along with renewal fee 15 days before expiry. Proper fine should be collected, for delayed date after expiry. Permit can be replaced with the permission of authority, by which the permit was granted, with other vehicle of its class. i.e., same model, capacity etc. Surrender of permit is done by the citizen by producing respective documents to the authorities. If the permit stays unrenewed after expiry date it will be cancelled by the authority of the RTO.

After collecting tax, fee and fitness certificate for the vehicle from the citizen, permit can be issued by printing documents. All the testing and printing operations are done by the operator. The fee for permit varies according to the state government.

Emailing facility and Complaints are available for the citizen users. If the life time of a vehicle or permit expires, an automated email will be generated and sent to the respective user. Citizen users can download all the forms related to road and transport from the download section of RaTas site.

2 SYSTEM ANALYSIS

2.1 Existing System

The existing system is available in many Road and Transport offices around TamilNadu known as Vahan and Sarathi. Vahan is related to all vehicle related details and Sarathi deals with license information. This software was developed by National Informatics Center (NIC) and first implemented using Visual basic as front end and oracle as back end.

It has a lot of forms and applications based on papers. It provides features such as billing, document generation for respective operations. This software does not match for present day's application technology. It lacks appointment facility, search facility, mailing facility etc.

The updates are released whenever new zones are added by NIC. These updates are to be integrated with the database. Database is directly accessed every time that makes it less secured and destructible one. A person who is in need of license or permit should go to the respective zone directly. All operations cannot be done at a single RTO zone. Offices in different locations within a zone issue different documents. Lot of manual work is needed and it has no searching facility.

Tracing vehicles and blacklisting a vehicle is not possible. Moreover, it has less security of data and it consumes more storage space. These constraints will be overcome in the proposed system.

2.2 Proposed System

The proposed system is designed to eliminate the drawbacks of the existing systems. The proposed system describes how all the operations of a Road Transport Office can be automated using RaTas. RaTas provide features such as online appointment fixing for clients, mailing facility, search facility, billing and printing documents etc. It provides security for data by using encryption schemes.

RaTas provide features for filling applications online and a centralized database for storing all details of vehicles and its owners. The database used for RaTas is MySQL. With superior speed, reliability, and ease of use, MySQL has become the preferred choice of corporate IT Managers because it eliminates the major problems associated with downtime, maintenance, administration and support.

The front end used here is Struts 2. The framework is designed to streamline the full development cycle, from building, to deploying, to maintaining applications over time. RaTas uses a middleware called Hibernate.

Hibernate is an object-relational mapping (ORM) library for the Java language, providing a framework for mapping an object-oriented domain model to a traditional relational database. Database is not accessed directly. Hibernate takes care of the database operations.

This software concentrates mainly on tight security to data and authentication is done which eliminates the proxy attendances. It utilizes low disc space and automates the project functionalities makes the management more flexible, easy, fast and efficient. It provides easy Navigations between screens and facility for fast searching. Security feature are adapted to the users according to the privileges.

All operations can be done at a single RTO zone. Special features such as messaging to citizen about services and forums are going to be integrated in future.

3. SYSTEM CONFIGURATION

The minimum requirements for the system to run effectively are:

3.1 Hardware Requirements

Processor	:	Intel Pentium Core2Duo 1.8 GHZ
Hard disk	:	160 GB
Main memory	:	1 GB
Keyboard	:	105 keys
Monitor	:	SVGA or VGA
Pointing device	:	optical mouse

3.2 Software Requirements

Frame Work	:	Struts 2
Technology	:	Java
ORM	:	Hibernate
Database	:	MySQL
IDE	:	MyEclipse
Browser	:	Google chrome, Safari, Firefox, IE 6

3.3 About the Software

3.3.1 Struts2 Framework

Struts and webwork has joined together to develop the Struts 2 Framework. Struts 2 Framework is very extensible and elegant front controller framework based on many standard technologies like Java Filters, Java Beans, ResourceBundles, XML etc. The framework is designed to streamline the full development cycle, from building, to deploying, to maintaining applications over time. The framework can use any data access technologies like JDBC, EJB, Hibernate etc and for the View, the framework can be integrated with JSP, JTL, JSF, Jakarta Velocity Engine, Templates, PDF, XSLT etc.

3.3.2 HIBERNATE

Hibernate core is the most popular Java ORM persistence tool. It provides automatic and transparent object/relational mapping allowing java objects to persist in a database after the java program exits. Hibernate is an object-relational mapping (ORM) library for the Java language, providing a framework for mapping an object-oriented domain model to a traditional relational database.

Hibernate solves Object-Relational impedance mismatch problems by replacing direct persistence-related database accesses with high-level object handling functions. In this project, Hibernate is used as middleware by which the database is not accessed directly. The database is handled by objects

3.3.3 JBOSS SERVER

JBoss Application Server (or JBoss AS) is a free software / open source Java EE-based application server. Because it is Java-based, the JBoss application server is cross-platform, usable on any operating system that Java supports.

In this project, jboss-4.2.2.GA is used as deployment server. Before deploying the project the server should be configured and necessary jars should be added. JBOSS uses the port number 8081. After deploying, the project can be run using any web browser by specifying the following address in url area.

<http://localhost:8081/Ratas>

3.3.4 MySQL

MySQL is the world's most popular open source database software, with over 100 million copies of its software downloaded or distributed throughout its history. With superior speed, reliability, and ease of use, MySQL has become the preferred choice of corporate IT Managers because it eliminates the major problems associated with downtime, maintenance, administration and support.

In this project, MySQL server 5.0 is used. It contains MySQL system tray monitor, MySQL migration tool kit, MySQL Administrator, MySQL Query browser. The user name is **root** and schema name is **trunk**. This should be specified in the config.cfg file.

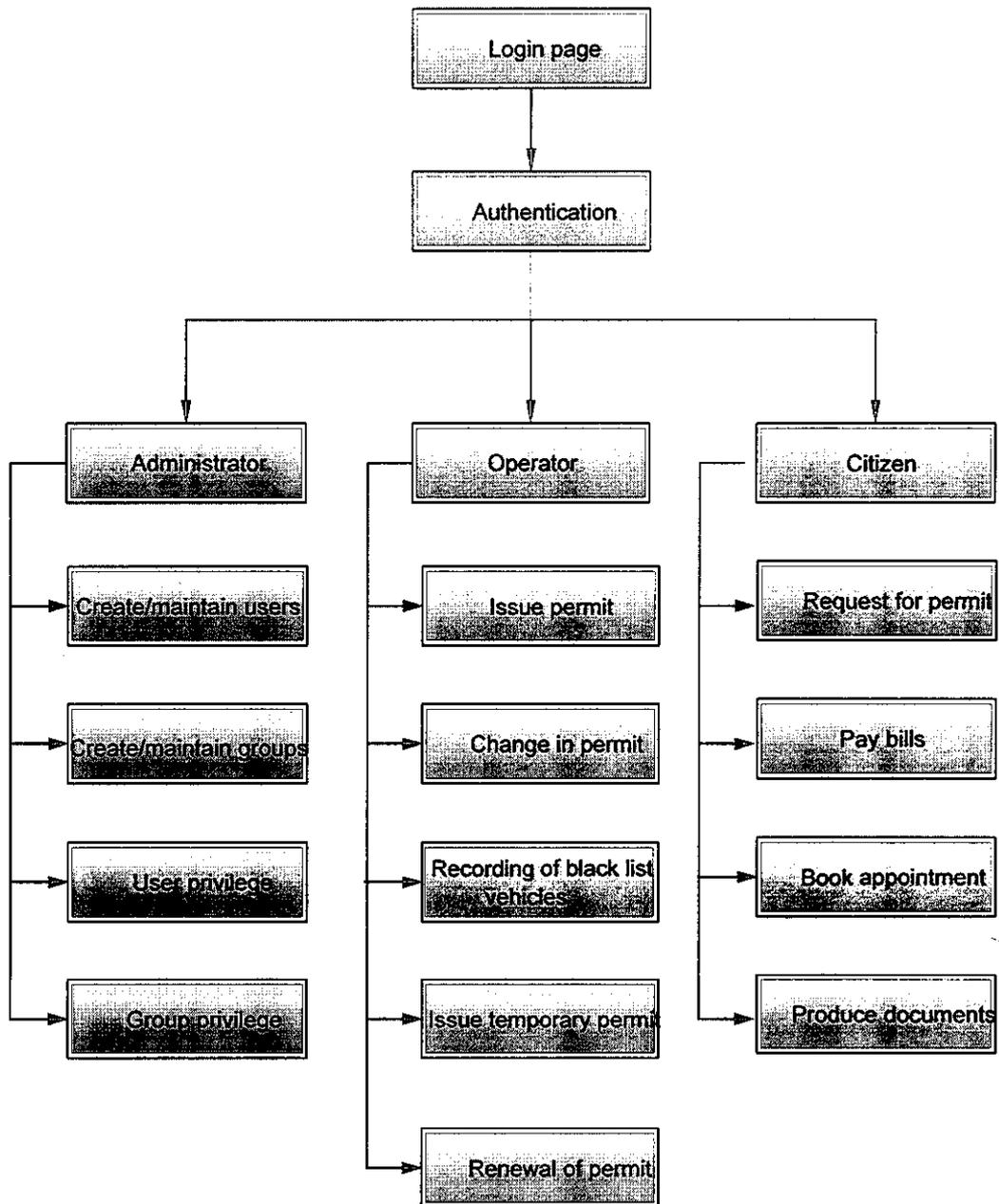
3.3.5. MyEclipse

MyEclipse is a commercially available Java EE and AJAX IDE created and maintained by the company Genuitec, a founding member of the Eclipse Foundation. MyEclipse is built upon the Eclipse platform, and integrates both proprietary and open source solutions into the development environment.

In this project MyEclipse is used as a web development tool required for designing and coding the project. It contains many perspectives and this project is developed in java perspective. Jar files and server are added to this project and run using MyEclipse interface.

4. SYSTEM DESIGN

4.1 Architectural Design



4.1 Architectural Design

For each zone, there will be an administrator, operators and citizen users. The architectural diagram shows the operation of each type of users of RaTas. The user

first enters the username and password. RaTas uses an encryption standard called Password based encryption, where the password of users are stored in the database as encrypted text. After authentication respective screens will be loaded for the user.

If the user is an administrator, he can create operator users, and assigning privileges to them based on their functionality. Groups for a zone can be created by the administrator and privileges are assigned. All the zonal activities are done under the supervision of the administrator.

If the user is an operator, he can get authorize citizen users who registered. There are many type of operator roles. He can inspect a vehicle and user to issue permit, renew permit, cancel/surrender permit, change permit, temporary permit. Theft vehicles can be blacklisted by producing respective FIR copies to the operator. The complaint will be passed to all the zones of RTO, with message based on priority levels low, high and very high.

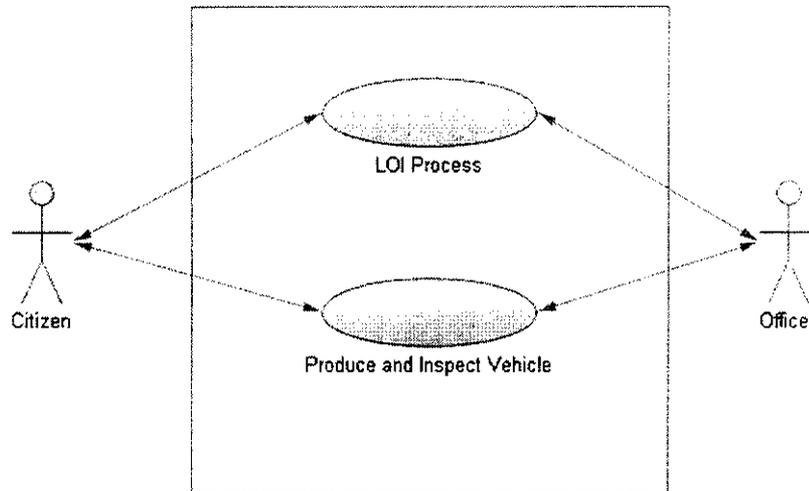
If the user is a citizen, he can get appointments for obtaining permit related activities. On the appointment day, he have to visit the RTO and furnish document proof to obtain permit. For recording a vehicle as blacklisted, the citizen should file a complaint about the vehicle details to the RTO. Along with the complaint, First Investigation Report from the police station has to be given. So that, the vehicle can be blacklisted and traced effectively. Citizen pays tax and bills to the operator and receives the permit. If the life time of permit expires, an automated mail will be sent to that citizen user. With in the time specified, he should renew it. Other wise it will be withheld by the user.

4.2 Use case Diagram: Issue Fresh Permit

4.2.1 Level-0

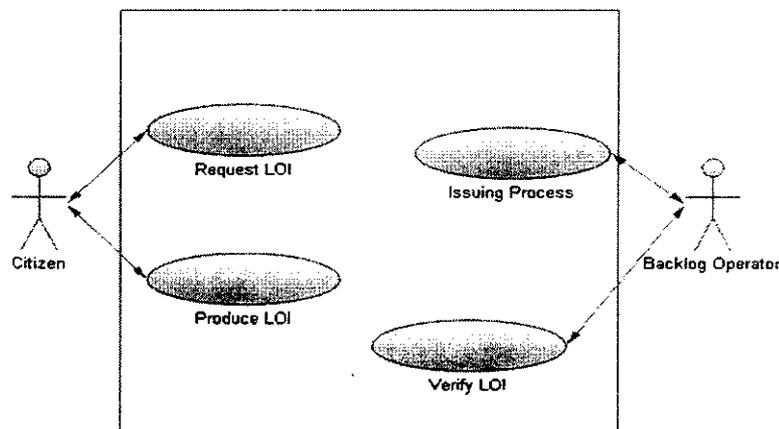
Level-0 of a use case deals with the overview of the operation. For obtaining permit, two basic operations are there. One is LOI process and other is Vehicle inspection. LOI is letter of investigation, in which the user should produce to the

officer at the time of vehicle fitness test. The vehicle is produced to the officer and gets inspected.



4.2.1 Issue of fresh permit: Level 0

4.2.2 Level-1



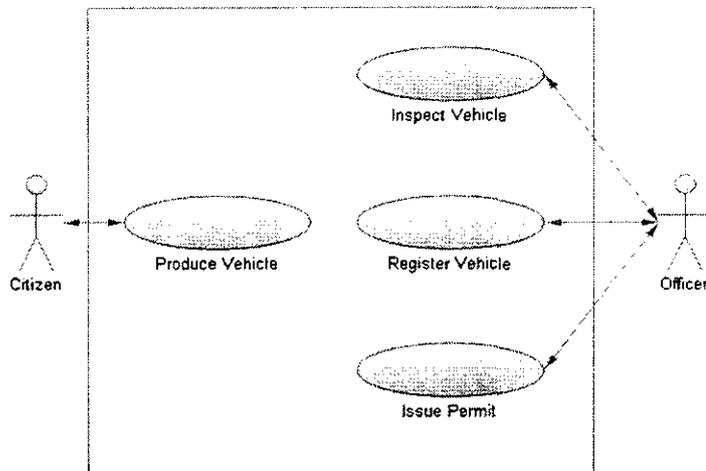
4.2.2 Issue of fresh permit: Level 1

Level-1 of a use case investigates a bit deeper. The citizen goes to the officer and requests a LOI application. The backlog operator issues the application. Citizen fills the document and furnishes proof documents. The backlog operator verifies the application and proceeds to the next stage.

4.2.3 Level-2

Level-2 of a use case completely describes the whole process of the operation. For the issue of fresh permit, operator and citizen get involved directly. First, citizen

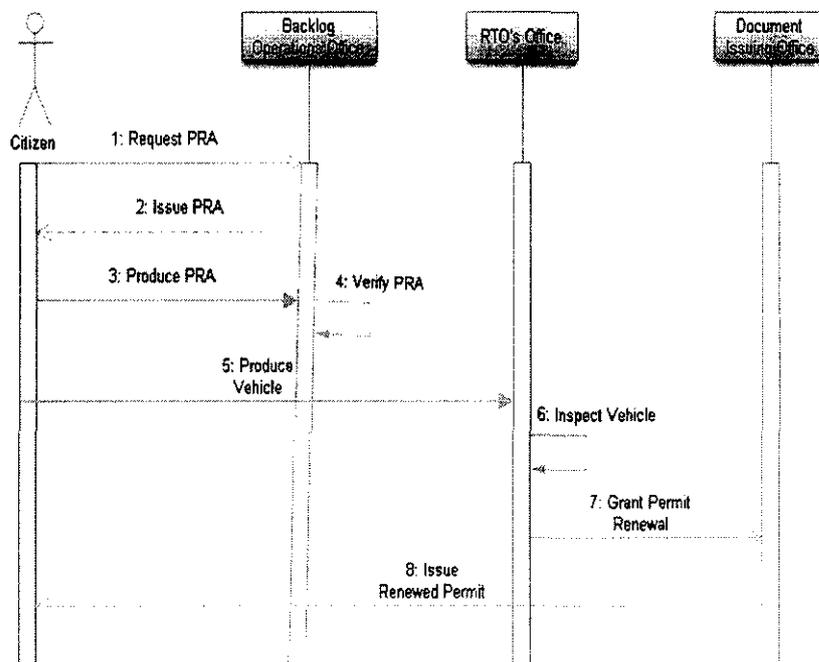
produces the vehicle to the testing authority. The vehicle is tested for fitness and a fitness certificate will be given. If the vehicle is a new one, it has to be first registered and inspected. After getting all the document proofs, and tax fee permit will be issued to the citizen.



4.2.3 Issue of fresh permit: Level 2



4.3 Sequence Diagram: Renew Permit



Renewal of permit involves the following steps. Citizen approaches the RTO operator and requests PRA application. The backlog operator issues the application.

One-one relation: Personal Table:

```
<one-to-one name="userid" class="com.ratas.dao.common.Users"/>
```

Many-to-one relation: Users Table:

```
<many-to-one class="com.ratas.dao.common.UserType" name="usertype" />
```

4.5 Table Structures**1. Appointments**

Column Name	Data Type	Description
pkid	string	Primarykey
status	string	Status of appointment
typeofoperation	string	Type of operation
date	date	Date of appointment
zone	string	Zone name
updateddate	date	Field updated date
Table Description: Appointments table is related to User table for storing appointment related details such as status of appointment, type of appointment, appointment date and zone.		

2. Proofs

Column Name	Data Type	Description
pkid	string	Primarykey
proofname	string	Name of proof
document	string	Proof document
description	string	Field description
prooftype	string	Type of proof
userid	string	User Id
updateddate	date	Field updated date
Table Description: This table is used to store proofs of a user. It is related to User table and Prooftype table.		

3. Complaint

Column Name	Data Type	Description
pkid	string	Primarykey
status	string	Status of complaint
date	date	Date of complaint
zone	string	Zone name
updateddate	date	Field updated date
Table Description: Complaints from the citizen are stored in this table. This table is related to complaintcategory table. Complaints from different zones are identified and stored according to their respective zones.		

4. Complaintcategory

Column Name	Data Type	Description
pkid	string	Primarykey
category	string	Complaint category
updateddate	date	Field updated date
Table Description: Complaints are divided into categories such as complaint related to license, permit or registration and stored in this table.		

5. Permitcost

Column Name	Data Type	Description
pkid	string	Primarykey
vehicletype	string	Type of vehicle
validity	string	Validity of permit
cost	string	Cost of permit
updateddate	date	Field updated date
Table Description: This table stores the permit cost and validity of a vehicle. It is related to vehicle type table.		

6. Statecost

Column Name	Data Type	Description
pkid	string	Primarykey
statename	string	Name of state
cost	string	Cost of permit
updateddate	date	Field updated date
Table Description: Cost of National permit varies for each state. This table stores the permit cost value for each state.		

7. Personal

Column Name	Data Type	Description
pkid	string	Primarykey
firstname	string	First name
secondname	string	Second name
dob	date	Date of birth
permanentaddress1	string	Permanent address of user
permanentaddress2	string	Permanent address of user
contactaddress1	string	Contact address of user
contactaddress2	string	Contact address of user
phone	string	Phone number of user
email	string	Email of user
mobile	string	Mobile number of user
updateddate	date	Field updated date
Table Description: This table stores all the values of the user. It is related to the User table.		

8. Photos

Column Name	Data Type	Description
pkid	string	Primarykey
photo	blob	Photo proof
updateddate	date	Field updated date
Table Description: Photos table is used to store the photograph of the user. The type of data used to store a photograph is BLOB. It is related to proof table.		

9. Vehiclecategory

Column Name	Data Type	Description
pkid	string	Primarykey
vehiclecategory	string	Category of the vehicle
updateddate	date	Field updated date
Table Description: This table stores the category of vehicle approved by the Transport authority. It is related to Vehiclemain table.		

10. Vehiclemain

Column Name	Data Type	Description
pkid	string	Primarykey
regno	string	Registration number of vehicle
dateofreg	date	Date of vehicle registration
vehicleid	string	Vehicle Id
hypo	string	Hypothecation
vehicletype	string	Type of vehicle
updateddate	date	Field updated date
Table Description: This table stores the values of a vehicle such as registration number, vehicle type, hypothecation details etc. It is related to vehiclemain, vehicletype, hypodetails table.		

11. Zones

Column Name	Data Type	Description
pkid	string	Primarykey
zone	string	Zone name
district	string	District name
state	string	State name
rtocode	string	Regional transport office code
noofappointments	string	Number of appointments per day
updateddate	date	Field updated date
Table Description: This table stores the list of zones, users and vehicles belonging to a particular zone. It is related to Vehiclemain and User table.		

12. Permitmain

Column Name	Data Type	Description
pkid	string	Primarykey
userid	string	User Id
permitvalidity	date	Validity of permit
permittype	string	Type of permit
permitcost	string	Cost of permit
state	string	State name
state1	string	State name
state2	string	State name
state3	string	State name
zoneid	string	Zone Id
updateddate	date	Field updated date
Table Description: Permitmain stores the details of a vehicle which obtained permit. It also stores the user and zone belonging to the vehicle. It is related to Zone, Permittype and User table.		

13. Vehiclehistory

Column Name	Data Type	Description
pkid	string	Primarykey
vehiclehistorytype	string	History type of the vehicle
description	string	Field description
updateddate	date	Field updated date
Table Description: This table stores the history of a vehicle recorded by the Transport Office. It is related to Vehiclehistorytype and Vehiclemain table.		

14. Users

Column Name	Data Type	Description
pkid	string	Primarykey
username	string	Username
password	string	Password
doa	date	Date of appointment
question	string	Question
answer	string	Answer
authorized	string	Authorized user
usertype	string	Type of user
zone	string	Zone where the user belongs
updateddate	date	Field updated date
Table Description: This table stores all the details of all the users belonging to a Regional Transport Office. It is related to Personal, License, Usertype and Zones tables.		

15. Hypodetails

Column Name	Data Type	Description
pkid	string	Primarykey
vehicleid	date	Vehicle Id
updateddate	date	Field updated date
Table Description: This table stores the details of a vehicle, if it is under hypothecation. It is related to vehiclemain table.		

16. Vehicledetails

Column Name	Data Type	Description
pkid	string	Primarykey
manufacturer	string	Vehicle manufacturer
noofcyl	string	Number of cylinders in vehicle
yearofman	date	Year of manufacturing of vehicle
chasisno	string	Chasis number of vehicle
engno	string	Engine number of vehicle
hp	string	Horse power of vehicle
makeclass	string	Vehicle make class
seatingcap	string	Seating capacity of vehicle
unweight	string	Weight of vehicle without loading
color	string	Color of the vehicle
fuelused	string	Type of fuel used
bodytype	string	Body type of the vehicle
roadtax	string	Road tax
updateddate	date	Field updated date
Table Description: It stores all complete details of a vehicle. It is connected to vehicle main table.		

5. SYSTEM DEVELOPMENT

System development is a series of operations performed to manipulate data to produce output from computer system. This aim at translating the design of the system produced during the design phase into code in user programming language. A modular approach is used for the development of the software.

The development phase for the project was created from the specifications created during the design phase. A principal activity of the development phase is coding and testing the computer program that make up the computer program component of the overall system. Other important activities include implementation, planning, equipment acquisition and system testing. The development phase concludes with the report and review.

5.1 User Characteristics

The users of RaTas are classified into the following groups based on the functionality.

Super User: Super User is the only user type with high and full-fledged privileges. Super User manages all zones, administrator, and categorical information. A new zone can be added and an administrator can be created and assigned by the Super User. He is responsible for adding different categories such as license, registration, permit, proofs etc.

Administrator: Each RTO zone will have an administrator. He is responsible for all activities that take place in a zone. Admin only can create account for the operators of that zone. He manages the zonal news and uploads documents for the citizen. Tests for license is conducted and managed online by the admin. The operator roles are defined only by the administrator.

Citizen: Citizen is the ultimate benefiter of this system. He can use this system anywhere, where internet is available. He uses this site to get appointments, know news happening in the RTO.

Operator: Operator is one who maintains records regarding tax and fee collection, backlog operations, performing entry and printing statements and receipts, scrutinizing, processing.

The operators in this module are:

Cashier: one who collects fees and tax from the citizen.

Entry clerk: one responsible for entering details in the documents.

Backlog operator: performs operation related to back office.

Print operator: one who prints documents for citizen.

Officer: who is the verification and testing authority for vehicle fitness and license test.

5.2 Module Description

The modules available in permit modules are

- Issue of fresh permit
- Renewal of permit
- Change of permit
- Temporary permit
- Recording theft and blacklisted vehicle

5.2.1 Issue of fresh permit

Permit for vehicles are given when commercial vehicles cross a particular Regional Road Transport Office boundary. Vehicle permit are classified into following types.

Goods carriage permit

Permit for vehicle operating within a state and the fares are determined by the State Transport Authority.

National permit

Permit for vehicles to go outside a state. Minimum of four states should be specified.

Temporary permit

Permit issued to meet temporary and emergency needs during the time between expiry and renewal dates.

Passenger vehicle permit

Permit given for various types of vehicles to operate within a state. Fares will be determined by the State Transport Authority (STA).

Stage carriage permit

Permit for buses to operate on their allotted routes and the fares will be determined by STA.

Contract carriage permit

Permit to operate under a contract with his client for a fixed destination.

Institutional bus permit

Permit for institutional and organizational vehicles.

Rent a cab permit

Permit for a passenger who drives the vehicle by himself and fare is calculated for the number of days.

All India tourist permit

Permit for buses operating throughout the country.

All India tourist cab permit

Permit for cabs operating throughout the country.

For obtaining fresh permit, two basic operations are there. One is LOI process and other is Vehicle inspection. LOI is letter of investigation, in which the user should produce to the officer at the time of vehicle fitness test. The vehicle is produced to the officer and gets inspected. The vehicle is tested for fitness and a fitness certificate will

be given. If the vehicle is a new one, it has to be first registered and inspected. After getting all the document proofs, and tax fee permit will be issued to the citizen. On the appointment day, he/she should furnish all required documents to obtain permit.

5.2.2 Renewal of permit

Permit should be renewed before its time period expires. Time period of expiry of permit varies according to the type. The user should furnish all details in the Permit Renewal Application (PRA) along with renew fee. Permit should be renewed 15 days before it expires. Otherwise, a fine fee will be collected according to the permit type. Appointment is obtained by specifying the permit Id and appointment date. On the appointment day, he/she should furnish all required documents to renew permit. Emailing facility is also available. When permit period is going to expire, mail intimation will be sent to the respective user.

5.2.3 Change permit

Changes in a permit can be done for the following reasons. They are

Cancel/Surrender Permit:

Permit can be surrendering a permit before its validity period expires or it can be cancelled by the authority.

Replacement of Permit:

Permit can be replaced by the owner if it is lost with the help of authority. A duplicate copy of permit will be issued by producing FIR and reasons for the loss.

Replacement of vehicle in Permit:

A vehicle can be replaced in a permit by another vehicle by the owner with the permission of authority. A period of 4 months is allowed for the replacement of vehicle in a permit which is deposited on replacement mode, from the date of deposit of permit. Beyond this period, replacement is not allowed after charging the composition fee in pursuance of by State Transport Authority (STA).

Change of address in Permit:

Address in the permit can be changed by producing name and address proof of the user along with the charge for changes.

Transfer of Permit:

Permit can be transferred from one owner to another owner by producing respective documents. Transfer takes place when the owner of the vehicle sold the vehicle or he dies. The name can be changed to a new person.

Appointment for changing permit can also be done in the usual way specified above. On the appointment day, he/she should furnish all required documents to change permit.

5.2.4 Temporary Permit

Appointment for temporary permit can also be done. It is given on days on religious gathering, seasonal business, to meet particular needs, time between expiry date and renewal date. Temporary permit can be obtained for a vehicle one time in the life of a vehicle. On the appointment day, he/she should furnish all required documents to obtain permit.

5.2.5 Recording theft and Entry for blacklisted vehicle

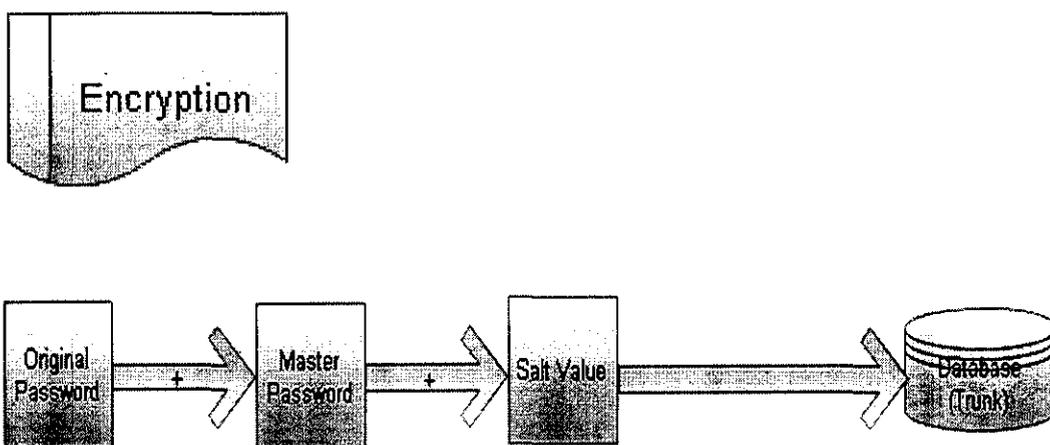
Theft vehicles and blacklisted can be identified and necessary actions are taken against the vehicle and its owner. Complaints from citizen are collected and details regarding theft or blacklisted vehicles are stored. The information is passed to all RTO's to take necessary actions and to trace the vehicle. For blacklisting a vehicle, a citizen must produce FIR report about the loss of vehicle to the authority.

5.3 Password Based Encryption:

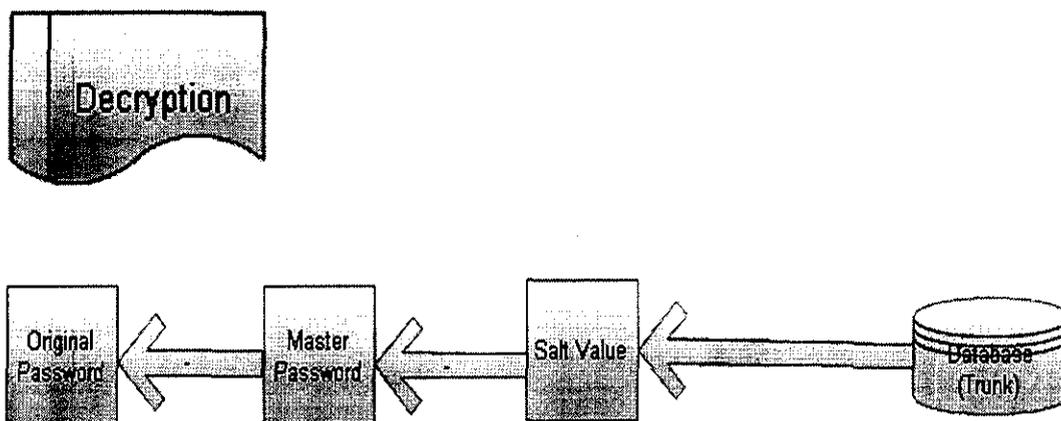
The password based encryption API's provide an object to hide the encryption functionality. This is the CPBEncryptElement and selects the default encryption algorithm and sets up the various vectors to ensure that the data and password are encrypted to accepted standards. The element then provides two sub elements, one of which performs the encryption and one of which provides the decryption. In addition to providing the cryptography, the element also provides methods to allow the data to

be serialized to and from a stream securely. The text is encrypted, written to a file stream, reloaded and then decrypted. If the password is incorrect the function will leave.

For encrypting a password, there will be a Master password and a salt value. The original password is added to the master password. It is then added with the salt value and the resulting encrypted password is stored to the database (trunk).



Decrypting the password is the reverse method of encryption. The salt value is removed from the encrypted text. Further the master password is also removed and the original password is retrieved from the database (trunk).



5.3 Password Based Encryption

5.4 Mailing, Searching and Digitizing data

In the existing system, there is no provision for searching and mailing. In this software searching facility is provided to search through the site for users, vehicles, licenses and documents. Emailing facility also available, that helps the citizen to get information from the RTO which they belong to. Mailing is done using Apache James. JAMES Server is an advanced fully functioned integrated mail server. It is a maillet container and delegates mail processing to maillets (independent processing agents). Most of these maillets are available through products in the maillets subproject. When the validity period of a document expires, a mail will be generated automatically and sent to the citizen users.

Apache James

JAMES Server is an advanced fully functioned integrated mail server. It is a maillet container and delegates mail processing to maillets (independent processing agents). Most of these maillets are available through products in the maillets subproject. The following protocols are supported:

- SMTP
- NNTP (better known as news)
- POP3
- IMAP (experimental)

Log4j

Log4j is an open source project based on the work of many authors. It allows the developer to control which log statements are output with arbitrary granularity. It is fully configurable at runtime using external configuration files. Log4j has been ported to the C, C++, C#, Perl, Python, Ruby, and Eiffel languages. Experience indicates that logging was an important component of the development cycle. It offers several advantages. It provides precise context about a run of the application. Once inserted into the code, the generation of logging output requires no human intervention. Moreover, log output can be saved in persistent medium to be studied at a later time. In addition to its use in the development cycle, a sufficiently rich logging package can also be viewed as an auditing tool.

In Vahan and Sarathi, every information is stored in papers. It is a tedious and time consuming job to search and retrieve data. In RaTas every data is digitized and stored in the server and it can be accessed from any part. The image copy of the users are digitized and stored in the database. The data type used for photo is “blob”.

iText

iText is a library to create, read or manipulate documents in PDF, RTF, HTML or XML format. iText can export the same document to multiple formats or multiple instances of the same format. Data can be written to a file or, for example, from a servlet to a web browser. More recently, it has been extended into a general purpose PDF library, capable of filling out forms, moving pages from one PDF to another, and so on. These extensions are often mutually exclusive. One class allows you to fill in forms, while a different and incompatible class makes it possible to copy pages from one PDF to another.

iText provides support for most of advanced PDF features such as PKI-based signatures, 40-bit and 128-bit encryption, color correction, PDF/X,color management via ICC profiles and barcodes.

6 SYSTEM IMPLEMENTATION

Implementation is the state in the System where the theoretical design is turned into a working system. The system can be implemented only after through testing is done and if found to work according to the specification. The most crucial stage in achieving a new successful system relies in giving confidence for the users on the new system that will work efficiently and effectively.

It involves careful planning, investigation of the current system and to constraints on implementation, design of methods to achieve the changeover, an evaluation of changeover methods apart from planning. System Analysis and design efforts will be more complex system being used for writing program code.

One of the important development activities is the code of programming. The system Use cases and other channels are converted to modular programs; they have to be compiled, tested and debugged. RaTas is a web based project and it requires a server to run the project. The project runs on a centralized server where all the data are stored. The client terminal can access the server from anywhere using internet. *Data used in this system are digitized and stored in the server.*

For running this project, the web project is converted into .exe file using the software, Pack Jacket. For the conversion, the path of necessary jars and other files should be specified. If MySQL and JBoss is not available in the system where it is going to be implemented, the installation files of the MySQL 5.1 server and JBoss server should also be specified. The software can be run by double clicking the generated .exe file.

7 SYSTEM TESTING

7.1 Introduction to Testing:

Software testing is a critical element of software quality assurance and represents the ultimate reviews of specification, design and coding testing represents interesting anomaly for the software. During earlier definition and development phases, it was attempted to build software from an abstract concept to tangible implementation.

The testing phase involves the testing of developed system using various test data. Preparation of the test data plays vital role in the system testing. After preparing the test data the system under study was tested using those data. While testing the system, errors were found and corrected by using the following testing steps and corrections are also noted for future use. Thus, a series of testing is performed for the proposed system was ready for the implementation.

JUNIT:

JUnit is a unit testing framework for the Java programming language. Unit has been ported to other languages, including PHP (PHPUnit), C# (NUnit), Python (PyUnit), Fortran (fUnit), Delphi (DUnit), Free Pascal (FPCUnit), Perl (Test::Class and Test::Unit), C++(CPPUnit), and JavaScript (JSUnit). This family of unit testing frameworks is referred to collectively as xUnit. TestNG has many of the same goals as JUnit. JUnit is linked as a JAR at compile-time; the framework resides under packages junit.framework for JUnit 3.8 and earlier and under org.junit for JUnit 4 and later.

7.2 Unit Testing:

Unit testing focuses verification efforts even in the smallest design in each module. This is also known as “Unit Testing”. Since the proposed project has six modules, the testing is done individually on each module and every form designing. Each and every form is tested to complete their functionality. The small units in the proposed project are the web forms and the functionality behind it.

Test case: unit testing

Test case ID	Test description	Test input :	Expected output
T001	To check the forms are downloadable	Open the downloads page, click on links specified for the forms.	Selected forms to be downloaded
T002	Checking for pre-fetched data on the combo box	Open the new registration page and click the combo box for vehicle types	Requested vehicle types are to be displayed
T003	Checking for appointment dates	Login as a citizen, go to specified task he requires, click for book appointment	Saturday, Sunday, government holidays should not be displayed

By means of this unit testing the errors such as alignment problem, visibility of the required fields, available of expected data such as vehicle types, data connection between the database and the forms, action reflection on database, Using the test plans, prepared in design phase of the system development as a guide, important control paths are tested to uncover error within the boundary of the proposed project. In this testing each module is found to be working satisfactory, as regard to expected output from the proposed project.

7.3 Integration Testing:

Data can be lost across an interface, one module can have an adverse effect on the other sub-functions, when combined may not produce the desired functions. Integrated testing is the systematic testing to uncover the errors within the interface.

In the proposed project, the presence several forms the migration from one form to the other form will be successfully carried out. Apart from this the integration of all the three major modules licence module, registration module, permit module is carried out successfully by means of following the integration test procedures.

Test case: Integration testing

Test case ID	Test description	Test inputs	Expected output
T001	To check the menus for corresponding users	Open the login page, Provide Username : admin Password : admin	Create operator, Edit operator To be displayed
T002	Checking appointments for respective category	Login as operator, click on appointments Select the appointments for requested category	Appointments for the requested category should be displayed
T003	Checking the pdf conversion	Go to appointments page as a operator, click on generate report	Report regarding appointment to be displayed as a pdf in acrobat reader.

7.4 Validation Testing:

Software validation is achieved through a series of black box testing that demonstrate conformity with requirements.

Test case: Validation testing

Test case ID	Test description	Test inputs	Expected output
T001	To check the age field	Open the new user registration page. Fill the required fields and fill the age column as "aaa"	Error message describing that type only numerals.
T002	Checking appointments for respective category	Got to home page, give User name : citizen Password : citizen	Appointments for the requested category should be displayed
T003	Checking the pdf conversion	Go to appointments page as a operator, click on generate report	Report regarding appointment to be displayed as a pdf.

In the proposed system validation testing is achieved in the form of checking the textbox inputs on the web pages specified. If the textbox should only handle the numerical values, example: age field. The specified textbox should accept the numerical values otherwise it should display error message.

7.5 Security Testing:

If the administrators have to enter the server side of the software we have to specify the user name and password. When the user enters the user name and the password, checking it with already registered in the database or not. If it matches, then only the user is allowed to access the page. Otherwise he is denied accesses and there by provides a strong security.

Test case: Security testing

Test case ID	Test description	Test inputs	Expected output
T001	To check the encryption of password	Go to new user registration page, provide the required details.	Stores Password field in the database as an encrypted manner
T002	Checking for enabling of user menu	Login as citizen, using Username: citizen Password: citizen	Only menus corresponding to the citizen to be displayed
T003	Checking for the access of unauthorized user	Make the new user registration. Give the user name and password which was currently created.	Message showing user not authorized should be displayed(once the operator

The main security concern on the web based project is the concept of hacking. Hacking can be done on any way one is the username and password encryption, the other one is the tapping of sensitive information. This security is avoided because of

the encryption technique followed. Thus using this security testing the unauthorized access is avoided.

7.6 White Box Testing:

White box testing sometimes called glass box testing, is a test case design method that uses the control structure of the procedural design to derive test cases. Using white box testing methods, the internal calculations for bills for various aspects will be processed successfully.

Test case: White box testing

Test case ID	Test description	Test inputs	Expected output
T001	To check appointments reaches the corresponding department	Login as operator, using Username: operator Password: operator Go to appointments page Click on generate report	Report regarding appointment to be displayed as a pdf in acrobat reader.
T002	Checking for enabling of user menu	Login as citizen, using Username: citizen Password: citizen	Only menus corresponding to the citizen to be displayed
T003	Checking for the blob conversion of the images	Attach an image through file upload	Stores image in database by means of blob datatype

7.7 Black Box Testing:

Black box testing also called behavior testing focuses on the functional requirements of the software. That is, black box testing enables the software engineer to derive sets of input conditions that will fully exercise all functional requirements for a program.

Black box testing will be done with the help of end users who are going to use the application, it is mainly tested by the testers who will not care about the internal

functionality of the application. He only cares about the input provided and the corresponding output to the provided input. By means of incorporating this black box testing several errors, bugs will be identified.

Test case: Black box testing

Test case ID	Test description	Test inputs	Expected output
T001	To check the pdf conversion	Login as citizen, using Username: citizen Password: citizen Fix an appointment to register a new vehicle	Appointment for registration to be done on the selected date
T002	Checking for proper logout	Login as citizen, using Username: citizen Password: citizen Click on the logout	User should logout, the home page to be displayed
T003	Checking for unauthorized access	Open the home page . Enter Username: citizen Password : citi (in correct password)	Message showing incorrect password is to be displayed.

8 PERFORMANCE AND LIMITATIONS

8.1 Merits of the system:

RaTas provide features to automate the project functionalities make the management more flexible, easy, fast and efficient and provide easy Navigations between screens. Security feature are adapted to the users according to the privileges. Enable to access the required data whenever required in the form of detailed efficient and fast. The major advantages of the system are,

- Online appointment fixing.
- Facility for fast searching.
- S/W for billing and printing documents.
- Emailing facility for clients.
- The right authentication is done which eliminates the proxy attendances.

8.2 Limitations of the system:

Inspite of all these automations, proof documents should only verified manually due to security reasons. Another limitation is, it does not have any agent usertype. Agent type is used to create accounts and authorize accounts which reduce the burden of Operators.

8.3 Future Enhancements:

The Proposed System could be effectively implemented using RaTas – Road and Transport Automation Suite. In the future, messaging facility through mobiles, adding agent usertype and forums are going to be integrated.

If the time period of permit of a citizen is going to expire, a message will be generated and sent to the respective citizen. Forums will be integrated with the system which enables the users of RaTas to come close together for communication. They can post any doubts and get solutions from other users. These enhancements make this software more efficient and useful to the users of RTO and citizen.

9 CONCLUSION

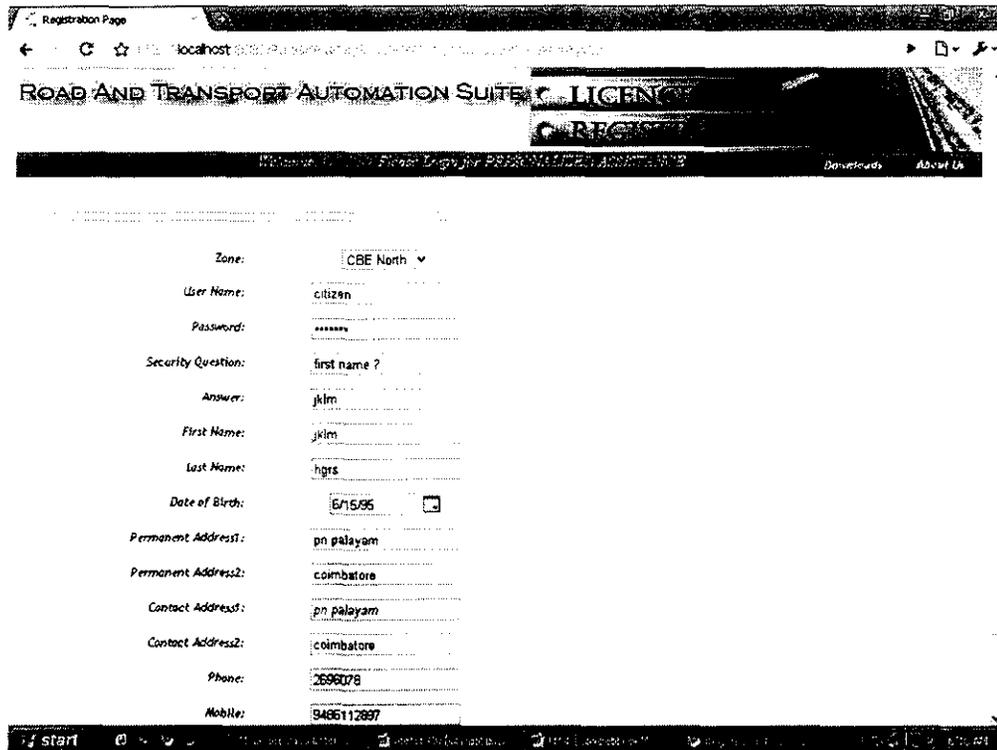
This project RaTas – Road and Transport Automation Suite was prepared with guidance and discussion with personal involved in this project and technical staff.

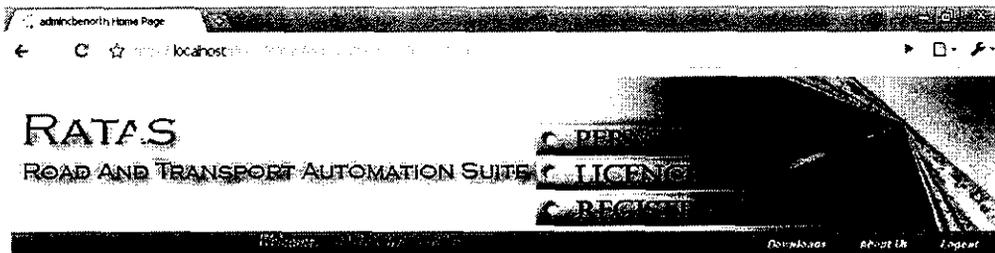
This project has developed with maximum care. It has been developed with an eye on expansion and flexibility at every stage of all the modules. This is, developed to meet almost all the requirements of the user. This will replace the existing manual system. This is more advantageous over the existing system as it takes into account the security and efficiency of the system. It is accurate and very fast and produces various kinds of detailed reports.

Further enhancements can be made at any later point of time. Reports can be represented in all-necessary perspectives. Added options can be included in designing reports. This project is developed in a user friendly manner in GUI software. The user can perform the operations such as addition, deletion, and modification of the database very easily but in a specified manner. After adding further requirements, this software will be a complete package containing all features and help the users of RaTas to utilize this application to the maximum.

10 APPENDICES

Screen Shots

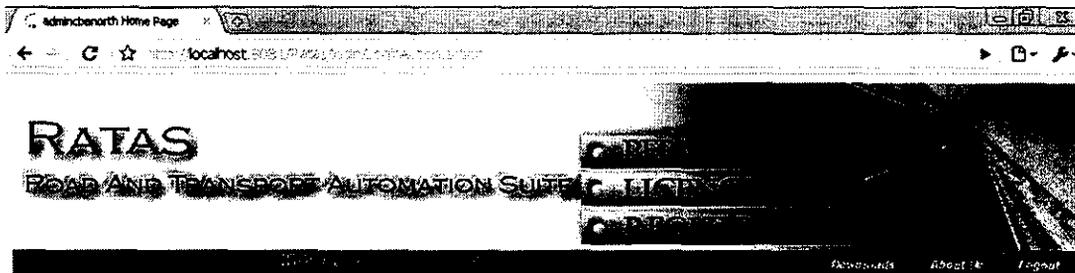




back
Add/Edit Operator

Operator Name:

Password:



back
Upload Documents

File:

Open

Look in: registration

- Form-35
- Form-31
- Form-31
- Form-33
- transform
- txt_Form
- Form-36
- Form-42
- Form-43
- Form-44
- Form-20
- FORM-25
- form-26
- form-27
- Form-28
- Form-29
- form-30
- form-34

File name:

Files of type:

Open as read-only



Http://localhost:8081/Ratas/...

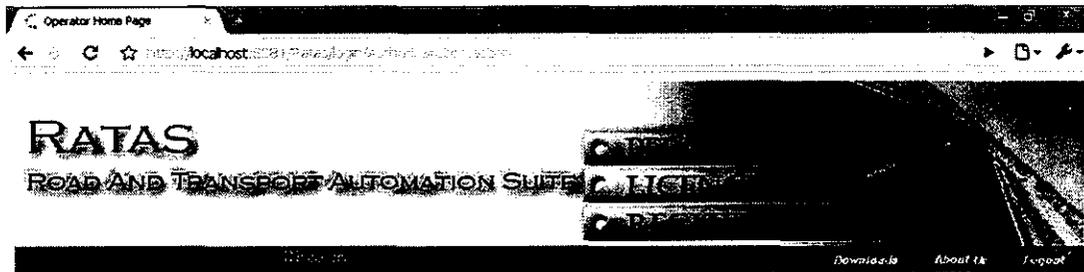
localhost

USER PROFILE

Date	Availability
30/June/2009 (Tuesday) - (0)	Book Appointment
01/July/2009 (Wednesday) - (0)	Book Appointment
02/July/2009 (Thursday) - (0)	Book Appointment
03/July/2009 (Friday) - (0)	Book Appointment
06/July/2009 (Monday) - (0)	Book Appointment
07/July/2009 (Tuesday) - (0)	Book Appointment
08/July/2009 (Wednesday) - (0)	Book Appointment
09/July/2009 (Thursday) - (0)	Book Appointment
10/July/2009 (Friday) - (0)	Book Appointment
13/July/2009 (Monday) - (0)	Book Appointment
14/July/2009 (Tuesday) - (0)	Book Appointment
15/July/2009 (Wednesday) - (0)	Book Appointment
16/July/2009 (Thursday) - (0)	Book Appointment
17/July/2009 (Friday) - (0)	Book Appointment
20/July/2009 (Monday) - (0)	Book Appointment
21/July/2009 (Tuesday) - (0)	Book Appointment
22/July/2009 (Wednesday) - (0)	Book Appointment
23/July/2009 (Thursday) - (0)	Book Appointment
24/July/2009 (Friday) - (0)	Book Appointment
27/July/2009 (Monday) - (0)	Book Appointment

Http://localhost:8081/Ratas/#

start



- [AUTHORITY USER \(\)](#)
- [PRINT BILLS](#)
- [APPOINTMENTS](#)

- [back](#)
- [Licence Schedules](#)
- [Permit Schedules](#)
- [Registration Schedules](#)

Users scheduled for Licence Operations		
No.	Name	View & Authority
1		View
2		View
3		View
4		View
5		View
6		View

Ratas Download Page

localhost:8081/RatasDownloadPage

RATAS

ROAD AND TRANSPORT AUTOMATION SUITE

[LICENCE](#)
[REGISTRATION](#)

[Home](#)
[Please Login for PERSONALIZED ACCOUNT](#)
[Downloads](#)
[About Us](#)

Change marked by a Diplomatic Officer Road TAX Verification
 Certificate Tourist Vehicle Permit National or Tourist Permit
 Authorization

Document Type	Description	Download
Licence	Duplicate Driving Licence	↓
Licence	Physical Fitness	↓
Licence	Medical Certificate for Driving Licence	↓
Licence	Driving Licence Renewal Grant	↓
Licence	Learners Licence	↓
Licence	Driving Licence for Motor Vehicles	↓
Licence	Renewal of Driving Licence	↓
Licence	Business Licence	↓
Licence	International of Driving Licence	↓

Http://localhost:8081/Ratas...

Http://localhost:8081/Ratas/RegistrationSubWebsiteUser.aspx

RATAS

ROAD AND TRANSPORT AUTOMATION SUITE

[LICENCE](#)
[REGISTRATION](#)
[PERMIT](#)

[Home](#)
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[About Us](#)
[Logout](#)

LICENCE

REGISTRATION

PERMIT

USER PROFILE

Existing Permit Details

* For National Permit Vehicles

Permit Number:

Date of Issue:

Date of Expiry:

Permit Type:

Vehicle Type:

Local State:

* Other State 1:

* Other State 2:

* Other State 3:

Password Encryption Coding:

```

package com.ratas.utils;
import javax.crypto.Cipher;
import javax.crypto.SecretKey;
import javax.crypto.SecretKeyFactory;
import javax.crypto.spec.PBEParameterSpec;
public class CryptoLibrary {
    private Cipher encryptCipher;

    private Cipher decryptCipher;

    private sun.misc.BASE64Encoder encoder = new
sun.misc.BASE64Encoder();

    private sun.misc.BASE64Decoder decoder = new
sun.misc.BASE64Decoder();

    public CryptoLibrary()
        throws SecurityException
    {
        java.security.Security.addProvider(new
com.sun.crypto.provider.SunJCE());

        char[] pass = "RATAS PASSWORD".toCharArray();

        byte[] salt = {
0x2c,                (byte) 0xa3, (byte) 0x21, (byte) 0x24, (byte)
0x19};                (byte) 0xf2, (byte) 0xd2, (byte) 0x3e, (byte)

        int iterations = 3;

        init(pass, salt, iterations);
    }

    public void init(char[] pass, byte[] salt, int iterations)
        throws SecurityException
    {

```

```

        try
        {
            PBESpec ps = new
javax.crypto.spec.PBESpec(salt, 20);

            SecretKeyFactory kf =
SecretKeyFactory.getInstance("PBESpec");

            SecretKey k = kf.generateSecret(new
javax.crypto.spec.PBESpec(pass));

            Cipher encryptCipher =
Cipher.getInstance("PBESpec/CBC/PKCS5Padding");

            encryptCipher.init(Cipher.ENCRYPT_MODE, k, ps);

            Cipher decryptCipher =
Cipher.getInstance("PBESpec/CBC/PKCS5Padding");

            decryptCipher.init(Cipher.DECRYPT_MODE, k, ps);
        }

        catch (Exception e)
        {
            throw new SecurityException("Could not initialize
CryptoLibrary: " + e.getMessage());
        }
    }

    /**
     * convenience method for encrypting a string.
     *
     * @param str Description of the Parameter
     * @return String the encrypted string.
     * @exception SecurityException Description of the Exception

```

```

*/
public synchronized String encrypt(String str)
throws SecurityException
{
    try
    {
        byte[] utf8 = str.getBytes("UTF8");
        byte[] enc = encryptCipher.doFinal(utf8);
        return encoder.encode(enc);
    }
    catch (Exception e)
    {
        throw new SecurityException("Could not encrypt: " +
e.getMessage());
    }
}
/**
 * convenience method for encrypting a string.
 *
 * @param str Description of the Parameter
 * @return String the encrypted string.
 * @exception SecurityException Description of the Exception
 */
public synchronized String decrypt(String str)

```

```
throws SecurityException
{
    try
    {
        byte[] dec = decoder.decodeBuffer(str);
        byte[] utf8 = decryptCipher.doFinal(dec);
        return new String(utf8, "UTF8");
    }
    catch (Exception e)
    {
        throw new SecurityException("Could not decrypt: " +
e.getMessage());
    }
}

public static void main(String[] args)
{
    try
    {
        CryptoLibrary cl = new CryptoLibrary();
        String user = "cryptotest";
        String pass = "blackmagic";
        String euser = cl.encrypt(user);
        String epass = cl.encrypt(pass);
        String duser = cl.decrypt(euser);
        String dpass = cl.decrypt(epass);
```

```
        System.out.println("User: " + user + " --> " + euser + " -  
-> " + duser);  
  
        System.out.println("Pass: " + pass + " --> " + epass + " -  
-> " + dpass);  
  
    }  
    catch (Exception e)  
    {  
  
        e.printStackTrace();  
  
    }  
}  
  
}
```

Hibernate HBM file: Users Table

```

<?xml version="1.0"?>
<!DOCTYPE                                hibernate-mapping                                SYSTEM
"http://hibernate.sourceforge.net/hibernate-mapping-3.0.dtd">
<hibernate-mapping auto-import="false" package="com.ratas.dao.common">
  <class name="Users" table="users">
    <id name="pkid" type="long">
      <generator class="native"/>
    </id>
    <property generated="never" lazy="false" name="username" type="string"/>
    <property generated="never" lazy="false" name="password" type="string"/>
    <property generated="never" lazy="false" name="question" type="string"/>
    <property generated="never" lazy="false" name="answer" type="string"/>
    <property name="authorized" type="string"/>
    <property name="doa" type="date"/>
    <property name="updateddate" type="date"></property>
    <property name="deleteddate" type="date"></property>
    <one-to-one name="personal" class="com.ratas.dao.common.Personal"/>
    <one-to-one name="licence" class="com.ratas.dao.licence.Licencemain"/>

    <many-to-one      class="com.ratas.dao.common.UserType"      name="usertype"
lazy="false"/>
    <many-to-one class="com.ratas.dao.common.Zones" column="zone" name="zone"
lazy="false"/>
  </class>
</hibernate-mapping>

```

Config file:

```

<?xml version='1.0' encoding='UTF-8'?>
<!DOCTYPE hibernate-configuration PUBLIC
    "-//Hibernate/Hibernate Configuration DTD 3.0//EN"
    "http://hibernate.sourceforge.net/hibernate-configuration-3.0.dtd">
<!-- Generated by MyEclipse Hibernate Tools.           -->
<hibernate-configuration>
<session-factory>
    <property name="connection.driver_class">
        com.mysql.jdbc.Driver
    </property>
    <property name="connection.url">
        jdbc:mysql://localhost:3306/trunk
    </property>
    <property name="connection.username">root</property>
    <property name="connection.password"></property>
    <property name="dialect">
        org.hibernate.dialect.MySQLDialect
    </property>
    <property name="hbm2ddl.auto">update</property>
    <!-- Echo all executed SQL to stdout -->
    <property name="show_sql">>false</property>
<mapping resource="com/ratas/dao/commons/personal.hbm.xml" />
<mapping resource="com/ratas/dao/commons/photos.hbm.xml" />
<mapping resource="com/ratas/dao/commons/proofs.hbm.xml" />
<mapping resource="com/ratas/dao/commons/prooftype.hbm.xml" />
<mapping resource="com/ratas/dao/commons/users.hbm.xml" />
<mapping resource="com/ratas/dao/commons/usertype.hbm.xml" />
<mapping resource="com/ratas/dao/commons/zones.hbm.xml" />
<mapping resource="com/ratas/dao/licence/licencehistory.hbm.xml" />
<mapping resource="com/ratas/dao/licence/licencehistorytype.hbm.xml" />
<mapping resource="com/ratas/dao/licence/licencemain.hbm.xml" />

```

```
<mapping resource="com/ratas/dao/licence/licencetype.hbm.xml" />
<mapping resource="com/ratas/dao/licence/testtype.hbm.xml" />
<mapping resource="com/ratas/dao/licence/usertest.hbm.xml" />
<mapping resource="com/ratas/dao/licence/signtest.hbm.xml" />
<mapping resource="com/ratas/dao/permit/permitcost.hbm.xml" />
<mapping resource="com/ratas/dao/permit/permitmain.hbm.xml" />
<mapping resource="com/ratas/dao/permit/permitype.hbm.xml" />
<mapping resource="com/ratas/dao/permit/statecost.hbm.xml" />
<mapping resource="com/ratas/dao/registration/hypodetails.hbm.xml" />
<mapping resource="com/ratas/dao/registration/vehicledetails.hbm.xml" />
<mapping resource="com/ratas/dao/registration/vehiclehistory.hbm.xml" />
<mapping resource="com/ratas/dao/registration/vehiclehistorytype.hbm.xml" />
<mapping resource="com/ratas/dao/registration/vehiclemain.hbm.xml" />
<mapping resource="com/ratas/dao/registration/vehicletype.hbm.xml" />
<mapping resource="com/ratas/dao/registration/vehiclecategory.hbm.xml" />
<mapping resource="com/ratas/dao/commons/appointments.hbm.xml" />
<mapping resource="com/ratas/dao/commons/complaint.hbm.xml" />
<mapping resource="com/ratas/dao/commons/complaintcategory.hbm.xml" />
<mapping resource="com/ratas/dao/commons/priority.hbm.xml" />

</session-factory>

</hibernate-configuration>
```

11 REFERENCES

Book References

Struts2 **Struts 2 Black Book**,
2nd Edition, Kogent Solutions Inc.
Chapters: 1-4,7,15

Web References

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<http://struts.apache.org/>
<http://www.roseindia.net/struts/struts2/index.shtml>
<http://www.vaannila.com/struts-2/struts-2-tutorial/struts-2-tutorial.html>

Hibernate <http://www.roseindia.net/hibernate/index.shtml>
<http://sourceforge.net/projects/hibernate>
<https://www.hibernate.org/>
<http://docs.jboss.org/hibernate/stable/core/reference/en/html/>

JBOSS 4.2.2 GA http://www.flexive.org/docs/3.0/website/jboss_installation.html
<http://sourceforge.net/>

MySQL 5.0 <http://dev.mysql.com/doc/refman/5.0/en/>