



INSTITUTE FOR ADVANCED COMPUTING AND SOFTWARE DEVELOPMENT AKURDI, PUNE

Documentation On

"RTO Management System"
PG-DAC SEPT 2021

Submitted By:

Group No: 06

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Table of Contents

1. Introducti	ion 3	
Р	roblem Statement	3
А	im & Objectives	3
Р	roduct Scope	3
2. Overall D	escription 4	
Pr	oposed Methedology	. 4
Ве	enefit of RTO Management System	. 4
O	perating Environment	. 5
De	esign and Implementation Constraints	. 6
3. Requirem	ents Specification7	
Ex	ternal Interface Requirements	. 7
Fu	nctional Requirement	. 8
No	on-Functional Requirement	8
4. System Di	iagram	
F	low Diagram	12
U	se Case Diagram	16
D	ata Flow Diagram 1	.8
EI	R Diagram2	21
5. Table Str	ucture	
6. Screensho	ts	
7. Conclusio	n 61	
Fu	uture Scope	51
8. Reference	s	

1. INTRODUCTION

Introduction:

RTO is a web system that provides the function and features to authenticate and identify the users and provide then with easy, intuitive, personalized and user-customizable web-interface for facilitating access to information and services that are of primary relevance and interests to the users.

Problem Statement:

There are many problems found in the todays RTO system. The problems created in the existing system enforced us to develop the new system which minimize the problem of the existing system. The problem in RTO system is that RTO officials has to maintain records physically and it requires a lot of paper work and manual efforts.

Aims & Objectives

The online RTO Management Web Application is intended to provide complete solution for Citizens, RTO Staff through a single Gateway using internet. It will enable Citizens and RTO staff to access information, modify information online without visiting the RTO office physically.

RTO (Regional Transport Office) system is an application that is designed for the RTO for the process of registration of vehicles and issuing Driving license, Learning License, Owner Ship Transfer based web Application. RTO Information System is an online information source developed for Road Transport Authority to facilitate the users in applying for various licenses and registrations.

Product Scope

This System allows Citizens to view, modify their information by adding or removing their information from the previous record. This system allows Citizens to apply for Driver license, Learning License, Vehicle registration, Vehicle permit, Transfer ownership. This system allows RTO Staff to Control Driving license, Learning license, Vehicle registration, Ownership transfer, Vehicle permit, Payments, Complaints.

2. Overall Description

Proposed Methodology:

The objective of RTO management system is to provide an online web-based solution for various RTO purposes. In this application all data will be available such as driving license, learning license, vehicle registration, vehicle permit, vehicle puc, vehicle ownership transfer are present in main server. It is Easy to use. In future it helps users and RTO staff to organize and access information about all aspect. This website provides a way for users and RTO staff to communicate to each other, this will solve all drawbacks of manual process and paper works, increase the efficiency and speed up all works to be completed. At RTO managements side a person can view and modify the data of users and their request for all the aspects. Every users and staff will provide with unique login id and password. All the data will be at least once validated from the RTO database. Hence this process also helps in maintaining consistency and integrity. The users and RTO staff can readily store and retrieve the data by clicking on the functionality given. Thus, the users is provided the convenience to interact with the system to readily and access the resources through internet or intranet.

Benefits of RTO Management System:-

- 1. The data of all the licensed holder will be stored in the main server.
- 2. This will reduce cost and space of the department.
- 3. No, need for doing heavy file work, as all the records will be stored in digital format.
- 4. Fake license holder will be caught easily.
- 5. Officers can easily charge on one click instead of writing on paper.
- 6. Data of driving license, learning license, vehicle permit, vehicle registration, vehicle ownership transfer, vehicle puc are present on main server.

Operating Environment:

• Hardware Requirement:

RAM	4 GB
Hard Disk	500 GB
Processor	Quad Core

• Software Requirement:

Client Side:

Web Browser	Google Chrome or any compatible browser	
Operating System	Windows or any equivalent OS	

❖ Server Side:

Web Server	TOMCAT	
Server-Side Language	React	
Database	MySQL	
Web Browser	Google Chrome or any	
	compatible browser	
Operating System	Windows or any equivalent	
	OS	

Design and Implementation Constraints:

- This application use JavaScript, Reactjs as main web technologies.
- This application use MySQL Database.
- This application use Spring Boot technology in Backend
- HTTP and FTP protocols are used as communication protocols. FTP is used to upload the web application in live domain and the client can access it via HTTP protocol.
- SMTP protocol is used for Email communication.
- Several types of validations make this web application a secured one and SQL Injections can also be prevented.
- Since RTO Management System is a web-based application, internet connection must be established.
- The RTO Management System will be used on PCs and will function via internet or intranet in any web browser

3. Requirements Specification

External Interface Requirements:

User Interfaces:

- All the users will see the same page when they enter in this website. This page asks the users a username and a password.
- After being authenticated by correct username and password, user will be redirect to their corresponding profile where they can do various activities.
- The user interface will be simple and consistence, using terminology commonly understood by intended users of the system. The system will have simple interface, consistence with standard interface, to eliminate need for user training of infrequent users.

Hardware Interfaces:

- No extra hardware interfaces are needed.
- The system will use the standard hardware and data communication resources.

This includes, but not limited to, general network connection at the server/hosting site, network server and network management tools.

Application Interfaces:

Web Browser:

The system is a web-based application; clients need a modern web browser such as Mozilla Firebox, Internet Explorer, Opera, and Chrome. The computer must have an Internet connection in order to be able to access the system.

Functional Requirements:

- Any anonymous User will be able to register and able to view about us.
 Registered citizens will be able to view, modify their details and able to see the status of the request which is under process.
- RTO staff will be able to accept, reject the request of citizens.
- RTO staff will be able modify details of citizens.
- RTO staff will be able to view and manage different tables i.e. Driving license table, Learning license table, Complaint table, RC table, Citizens details table, Payment table, Vehicle transfer table, PUC table.
- Dashboard will provide information using graph, tables, key performance indicators as well Grid data prestation.
- System and Technical team (IT Operations team) will be able to monitor system operations by monitoring logs maintained.

Non-Functional Requirement:

Security:

- Registered Citizens will be allowed to access their personal details.
- Each RTO Staff will be able to access system through **Authentication** process.
- System will provide access to the content, operations using Role based security
 i.e. Authorization
- Using Secure Socket Layer (SSL) in all transactions which will be performed by RTO staff. It would protect confidential information shared by system to RTO Staff.

- System will automatically log of all RTO Staff after some time due to inactiveness.
- System will block operations for inactive RTO Staff and would redirect for authentication.
- System will internally maintain secure communication channel between Servers (Web Servers, App Servers, Database Server)
- Sensitive data will be always encrypted across communication.
- Using proper firewall to protect servers from outside fishing, vulnerable attacks.

Reliability:

- The system will backup data on regular basis and recover in short time duration to keep system operational.
- Continuous updates are maintained, continuous administration is done to keep system operational.
- During peak hours system will maintain same user experience by managing load balancing.

Availability:

• Uptime: 24* 7 available.

Maintainability:

- A Commercial database software will be used to maintain System data Persistence.
- A readymade Web Server will be installed to host online RTO (Web Site) to management server capabilities.
- IT operations team will easily monitor and configure System using Administrative tools provided by Servers.
- Separate environment will be maintained for system for isolation in production, testing, and development.

Portability:

- PDA: Portable Device Application
- System will provide portable User Interface (HTML, CSS, JS, React) through which users will be able to access online RTO Management System.
- System can be deployed to single server, multiple server, to any OS, Cloud (Azure or AWS or GCP)

Accessibility:

- Only registered Citizens will be able to access theirs details after authentication.
- RTO staff team can reject or approve different requests from citizens.
- RTO staff team will be able to view daily, weekly, monthly and annual reports
 of requests of citizens through customized dashboard.
- Citizens can see their status of requests.

Durability:

- System will retain citizens details for 15 minutes even though citizens loose internet connection and join again or inactiveness after that it will be redirected to authentication.
- System will implement backup and recovery for retaining RTO's data, operation data over time.

Efficiency:

 On heavy traffic, System will be able to manage all transactions with isolation with same response time.

Modularity:

- System will be designed and developed using reusable, independent or dependent scenarios in the form of modules.
- These modules will be loosely coupled and highly cohesive.

• System will contain CRM, Driving license module, Payment module, Vehicle Registration module, Membership and Roles management module.

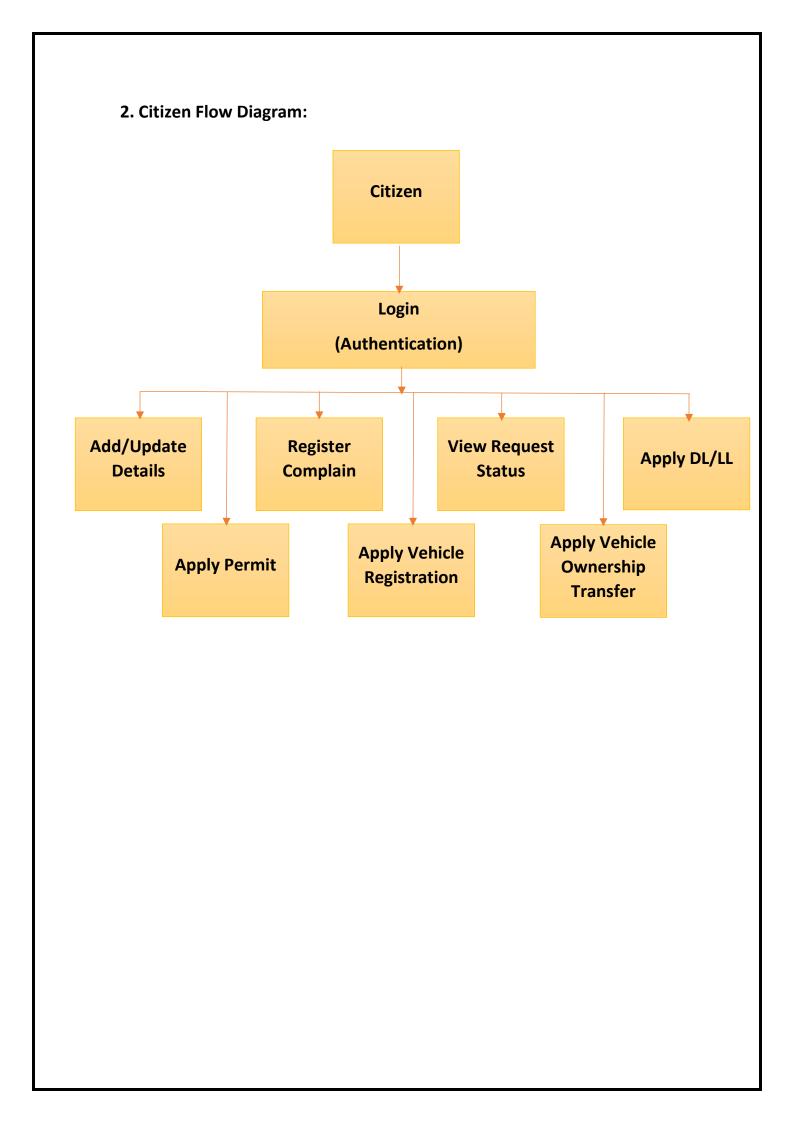
Scalability:

• System will be able to provide consistent user experience to RTO staff as well as citizens irrespective of load.

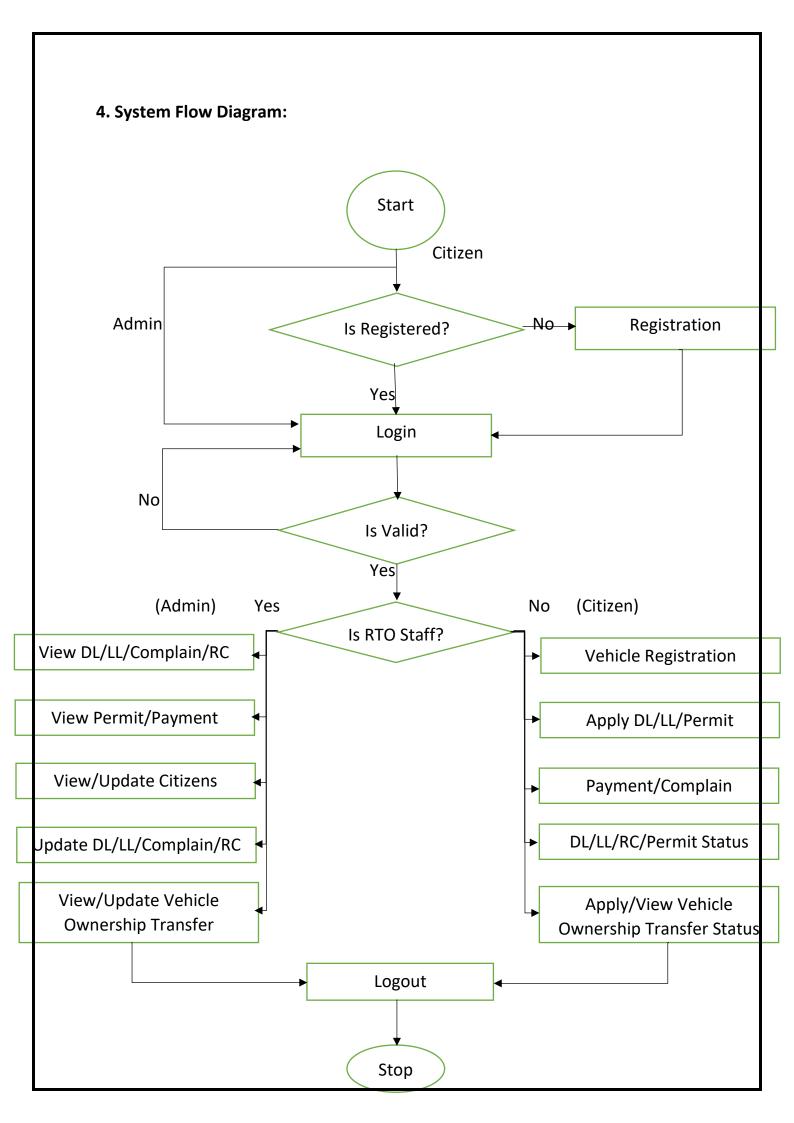
Safety:

- Online RTO management portal will be secure from malicious attack, fishing.
- Online RTO management portal functionalities are protected from outside with proper firewall configuration.
- Online RTO management portal will be always kept updated with latest antivirus software.
- RTO's data will be backed up periodically to ensure safety of data using incremental back up strategy.
- Role based security will be applied for Application data and operations accessibility.

4. System Diagram Flow Diagram: 1. RTO Modules Flow Diagram: **RTO Module** Membership and Driving Vehicle CRM **Payment** license **Roles management** Registration Module Module Module Module Module

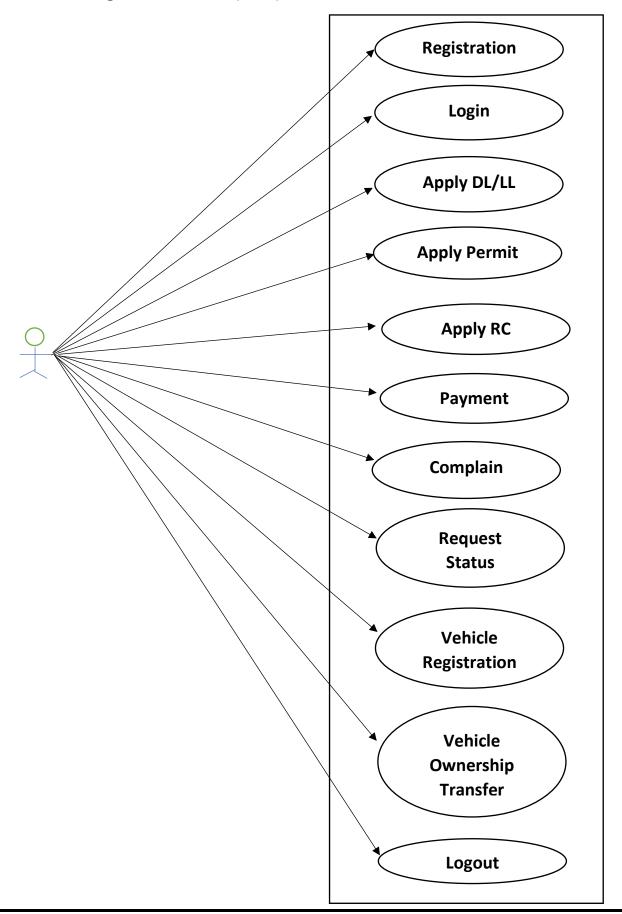


3. RTO Staff Flow Diagram: **RTO Staff** Login (Authentication) Accept/Reject **Update View** Requests DL/LL Complain RC **Status** Citizens Vehicle **Permit Details** Ownership Transfer

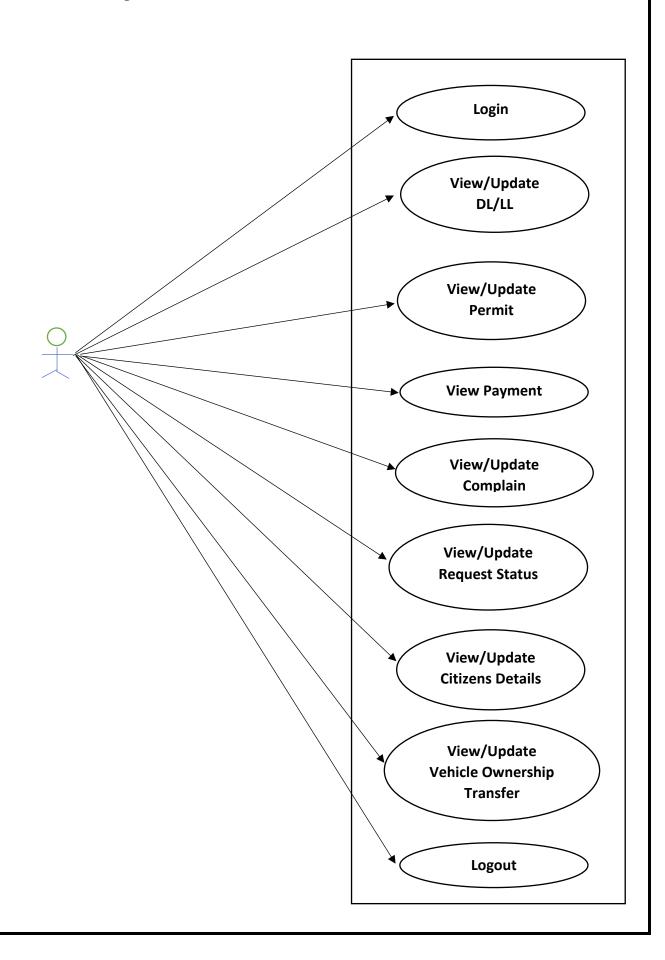


Use Case Diagram:

1. Use case diagram for Citizen (User)

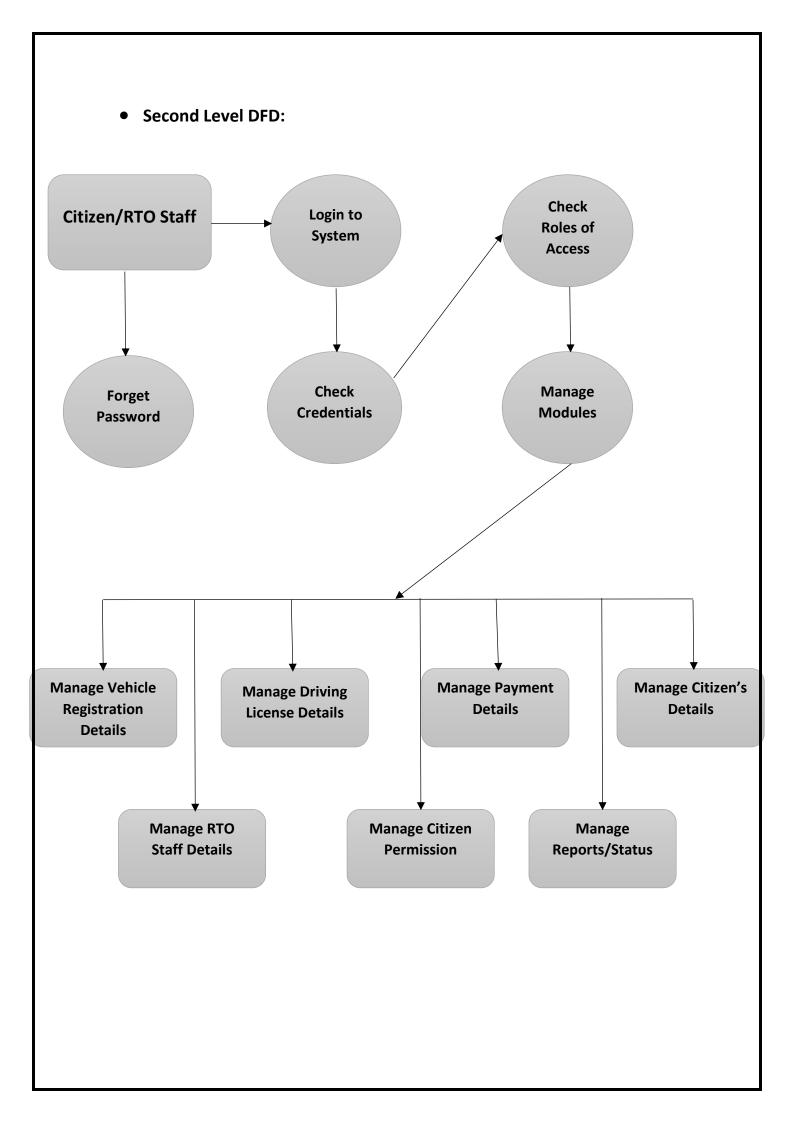


2. Use case diagram for RTO Staff

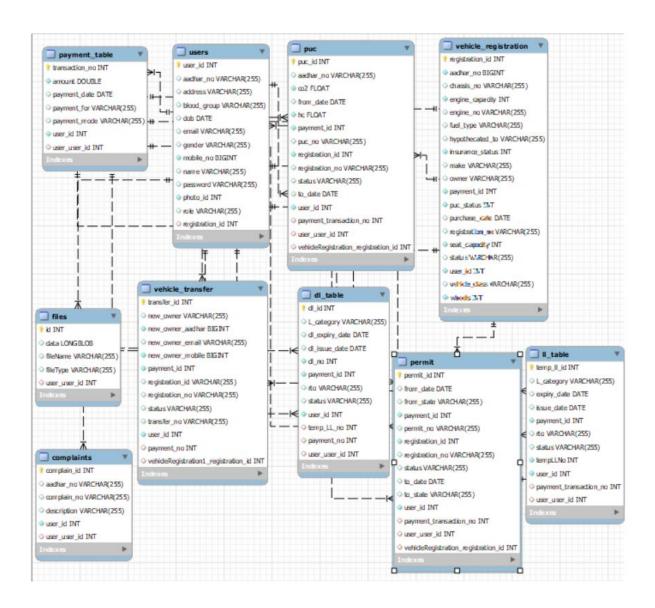


Data Flow Diagram: • Zero Level DFD: **Login Management** Vehicle License Registration Management Management RTO Management **System** Citizen Complain Management Management **RTO Staff** Management

• First Level DFD: **Login Management Check Login Details** License **Generate Citizen** Management **Details Generate RTO Staff** Citizen **RTO Details** Management Management **System Generate Vehicle RTO Staff Registration Details** Management **Generate Driving** Complain **License Details** Management **Generate Citizen** Vehicle **Details** Registration Management **Generate Status Details**



E-R Diagram:



5. Table Structure

• Citizen/RTO Staff (users):

Table Name	users
Description This table contains details of Cit	
Primary Key	id
Foreign Key	registration_id

S	Field Name	Data type	Constraint	Description
No.				
1	user_id	int	Primary key	It stores Citizen's id
2	aadhar_no	varchar	Unique	It stores Citizen's aadhar number
3	Name	varchar	Not null	It stores Citizen's name
4	address	varchar	Not null	It stores Citizen's address
5	gender	varchar	Not null	It stores Citizen's gender
6	Dob	date	Not null	It stores Citizen's date of birth
7	blood_group	varchar	Not null	It stores Citizen's blood group
8	mobile_no	long	Not null	It stores Citizen's mobile number
9	email	varchar	Not null	It stores Citizen's email
10	password	varchar	Not null	It stores Citizen's password
11	registration_id	int	Not null	It stores Registration details
12	role	varchar	Not null	It stores specific roles
13	photo_id	int	Not null	It stores photo

• Vehicle Registration:

Table Name	vehicle_registration
Description This table contains details of ve	
	registrations
Primary Key	registration_id
Foreign Key	registration_id

S	Field Name	Data type	Constraint	Description
No.				
1	registration_id	int	Primary key	It stores vehicle registration id
2	registration_no	varchar	Not null	It stores vehicle registration
				no
3	owner	varchar	Not null	It stores vehicle owner name
4	make	varchar	Not null	It stores vehicle make detail
5	chassis_no	varchar	Not null	It stores vehicle chassis no
6	purchase_date	date	Not null	It stores vehicle purchase date
7	vehicle_class	varchar	Not null	It stores vehicle class detail
8	fuel_type	long	Not null	It stores vehicle fuel type
9	engine_capacity	int	Not null	It stores vehicle engine
				capacity detail
10	engine_no	varchar	Not null	It stores vehicle engine no
11	insurance	int	Not null	It stores vehicle insurance
				detail
12	wheels	int	Not null	It stores vehicle wheels detail
13	payment_id	int	Not null	It stores vehicle payment id
14	status	varchar	Not null	It stores vehicle status detail

• Vehicle Transfer

Table Namevehicle_transfer	
Description	This table contains details of vehicle ownership transfer
Primary Key	transfer_id
Foreign Key	-

S	Field Name	Data type	Constraint	Description
No.				
1	transfer_id	int	Primary key	It stores vehicle transfer id
2	transfer_no	varchar	Not null	It stores vehicle transfer no
3	new_owner	varchar	Not null	It stores vehicle new owner name
4	new_owner_aadhar	long	Not null	It stores vehicle new owner aadhar
5	new_owner_email	varchar	Not null	It stores vehicle new owner email
6	registration_id	int	Not null	It stores vehicle registration id
7	registration_no	varchar	Not null	It stores vehicle registration no
8	new_owner_mobile	long	Not null	It stores vehicle new owner mobile number
9	citizen_id	int	Not null	It stores citizen id
10	payment_id	Int	Not null	It stores payment id
11	status	varchar	Not null	It stores status detail

• Payment

Table Name	payment_table
Description This table contains details of	
	payment
Primary Key	transaction_no
Foreign Key	-

S	Field Name	Data type	Constraint	Description
No.				
1	transfer_no	int	Primary key	It stores vehicle transfer no
2	payment_for	varchar	Not null	It stores payment made for detail
3	payment_mode	varchar	Not null	It stores payment mode detail
4	amount	double	Not null	It stores amount detail
5	citizen_id	int	Not null	It stores citizen id
6	payment_date	date	Not null	It stores payment date

• Complain

Table Name	complaints
Description	This table contains details of
	complain posted by citizens
Primary Key	complain_id
Foreign Key	-

S	Field Name	Data	Constraint	Description
No.		type		
1	complain_id	int	Primary key	It stores complain id
2	complain_no	varchar	Not null	It stores complain no
3	description	varchar	Not null It stores description of	
			complaint	
4	citizen_id	int	Not null	It stores citizen id

• Driving License

Table Name	dl_table
Description	This table contains details of Driving
	License
Primary Key	dl_id
Foreign Key	-

S	Field Name	Data type	Constraint	Description
No.				
1	dl_id	int	Primary key	It stores driving license id
2	dl_no	int	Not null	It stores driving license no
3	payment_id	int	Not null	It stores payment id
4	status	varchar	Not null	It stores driving license
				status
5	citizen_id	int	Not null	It stores citizen id
6	dl_issue_date	date	Not null	It stores driving license issue
				date
7	dl_expiry_date	date	Not null	It stores driving license
				expiry date
8	rto	varchar	Not null	It stores rto details
9	L_Category	Varchar	Not Null	It stores License category

• Learning License

Table Name	Il_table
Description	This table contains details of
	Learning License
Primary Key	temp_ll_id
Foreign Key	-

S	Field Name	Data type	Constraint	Description
No.				
1	temp_II_id	int	Primary key	It stores learning license id
2	dl_no	int	Not null	It stores learning license no
3	payment_id	int	Not null	It stores payment id
4	status	varchar	Not null	It stores learning license
				status
5	citizen_id	int	Not null	It stores citizen id
6	issue_date	date	Not null	It stores learning license
				issue date
7	expiry_date	date	Not null	It stores driving license
				expiry date
8	rto	varchar	Not null	It stores rto details
9	L_category	Varchar	Not Null	It stores license category

Payment

Table Name	payment_table	
Description	This table contains details of	
	payments	
Primary Key	transaction_no	
Foreign Key	-	

S	Field Name	Data type	Constraint	Description
No.				
1	transaction_no	int	Primary key	It stores payment id
2	Amount	int	Not null	It stores amount
3	payment_date	Date	Not null	It stores payment date
4	Payment_for	varchar	Not null	It stores for which category payment is done
5	citizen_id	int	Not null	It stores citizen id
6	Payment_mode	varchar	Not null	It stores payment mode

• Permit

Table Name	permit
Description	This table contains details of vehicle
	permit
Primary Key	permit_id
Foreign Key	-

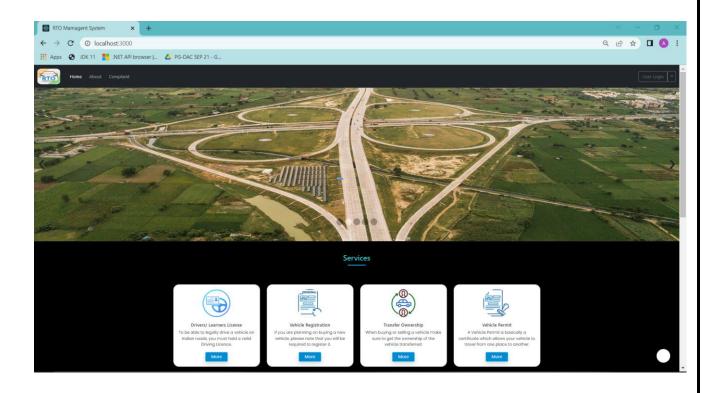
S	Field Name	Data	Constraint	Description
No.		type		
1	permit_id	int	Primary key	It stores permitid
2	From_date	Date	Not null	It stores from date
3	From_state	Varchar	Not null	It stores from state
4	Payment_id	Int	Not null	It stores payment id
5	citizen_id	Int	Not null	It stores citizen id
6	Permit_no	Varchar	Not null	It stores permit no
7	Registration_id	Int	Not null	It stores registration id
8	Registration_no	Varchar	Not null	It stores registration no
9	status	Varchar	Not Null	It stores status
10	To_date	Date	Not Null	It stores to date
11	To_state	Varchar	Not Null	It stores to state
12	Payment_transaction_no	Int	Not Null	It stores payment
				transaction no

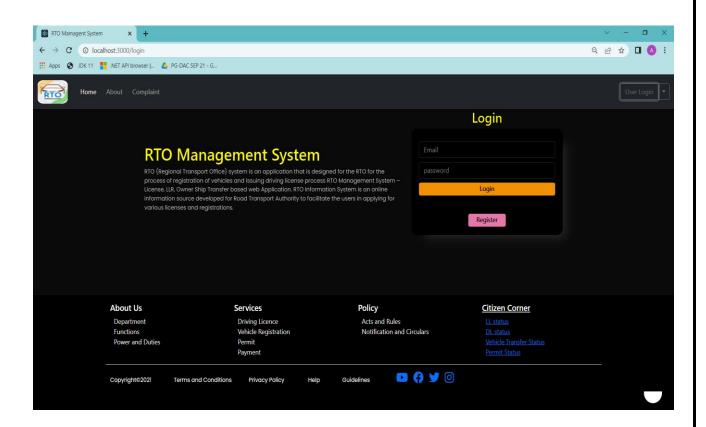
• Puc

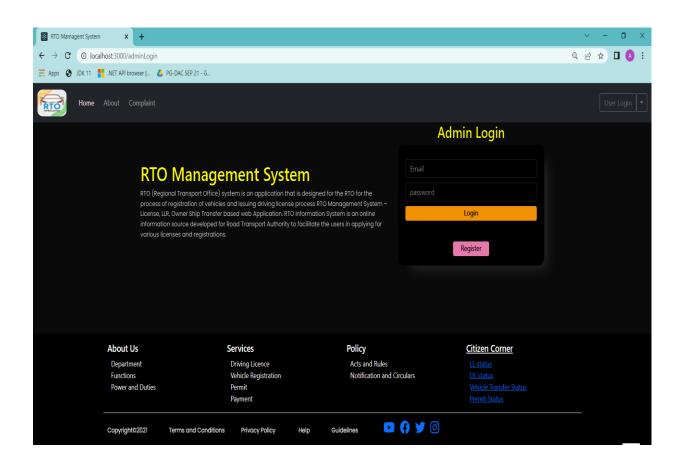
Table Name	puc
Description	This table contains details of vehicle
	puc
Primary Key	puc_id
Foreign Key	-

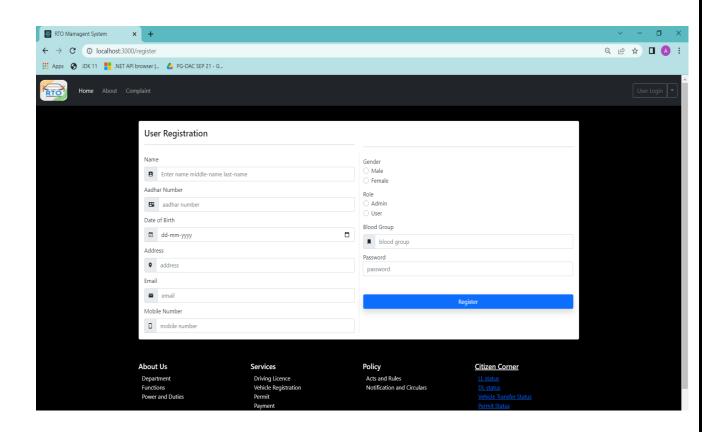
S	Field Name	Data	Constraint	Description
No.		type		
1	puc_id	int	Primary key	It stores puc id
2	Aadhar_no	varchar	Not null	It stores aadhar no
3	Co2	float	Not null	It stores from CO2
				value
4	From_date	date	Not null	It stores from date
5	HC	float	Not null	It stores Hydrocarbon
				value
6	Payment_id	int	Not null	It stores payment id
7	Puc_no	varchar	Not null	It stores puc no
8	Registration_no	varchar	Not null	It stores registration
			A A. II	no
9	Registration_id	int	Not Null	It stores registration
- 10				id
10	To_date	Date	Not Null	It stores to date
11	status	Varchar	Not Null	It stores to status
12	Payment_transaction_no	Int	Not Null	It stores payment
				transaction no

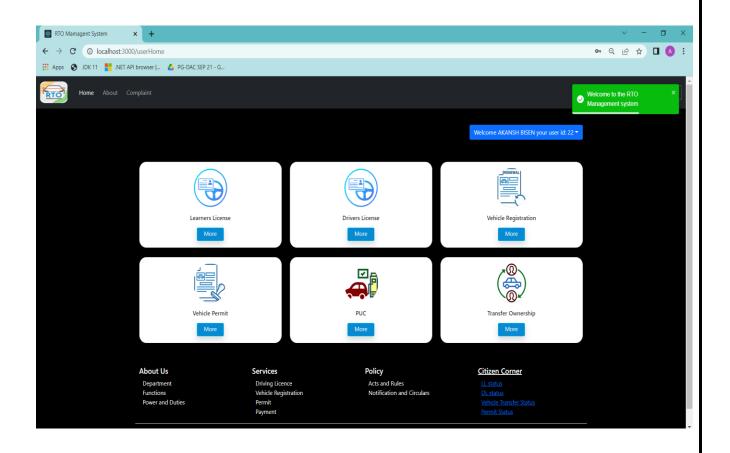
6. Screenshots

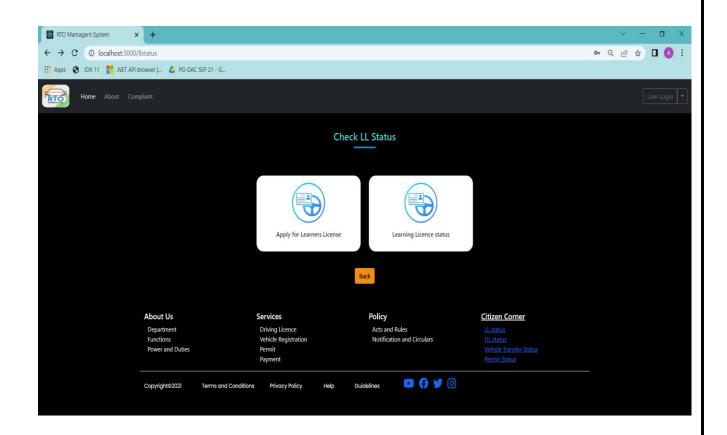


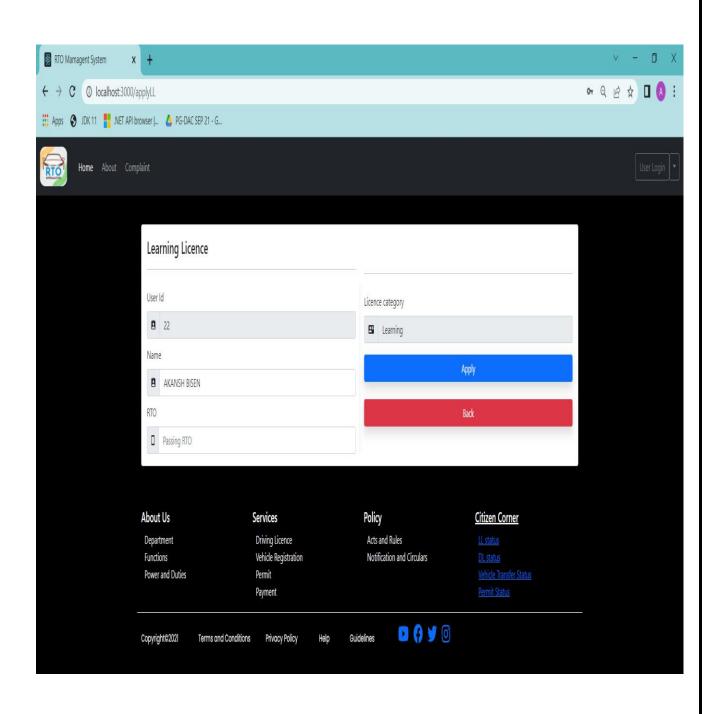


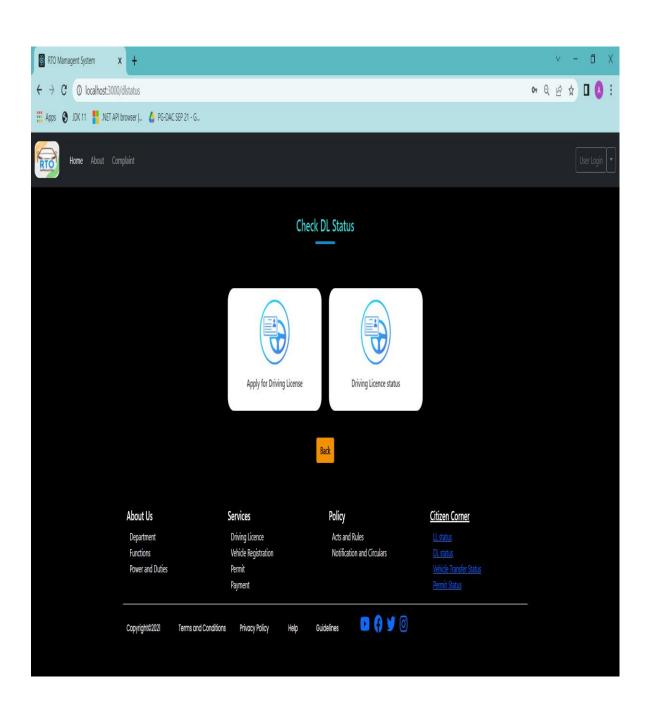


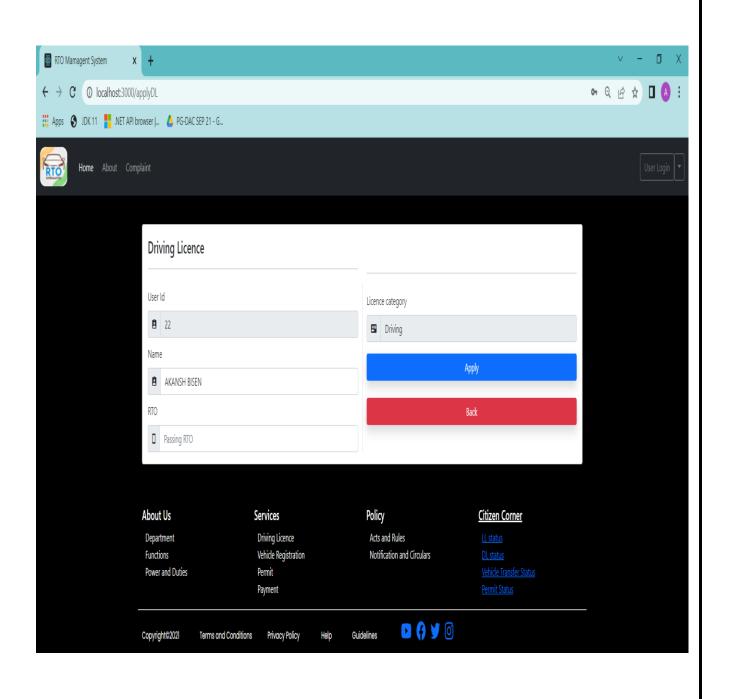


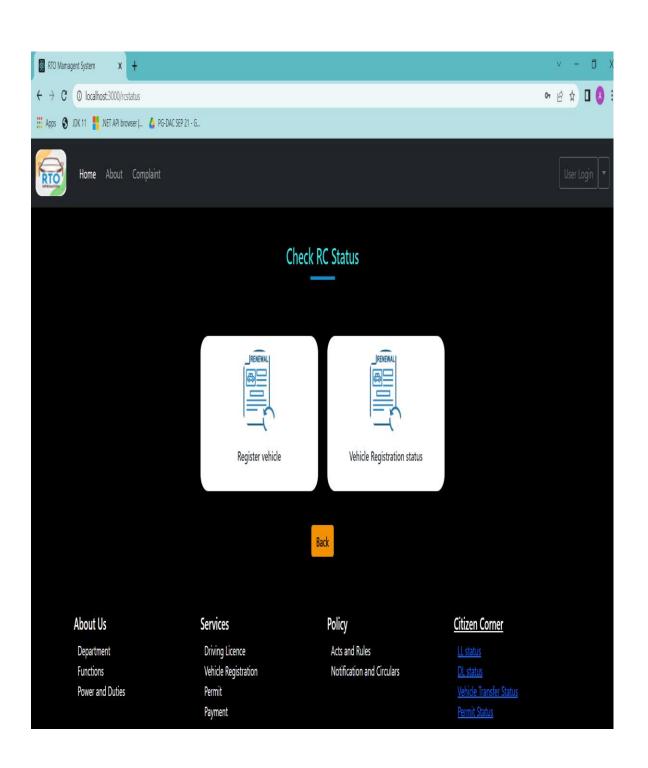


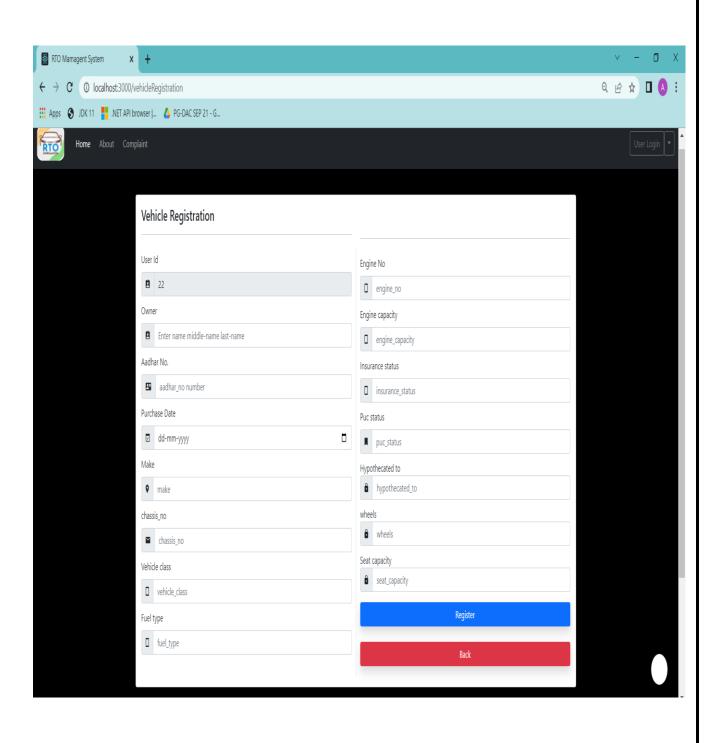


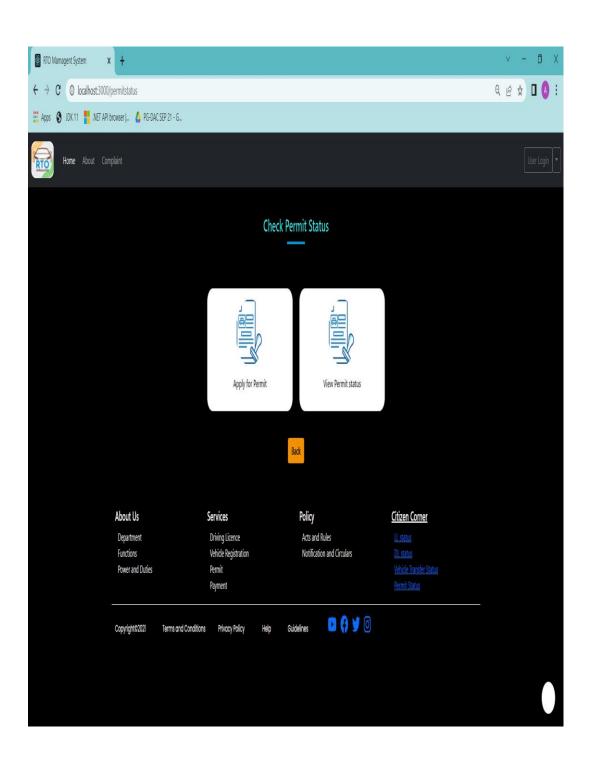


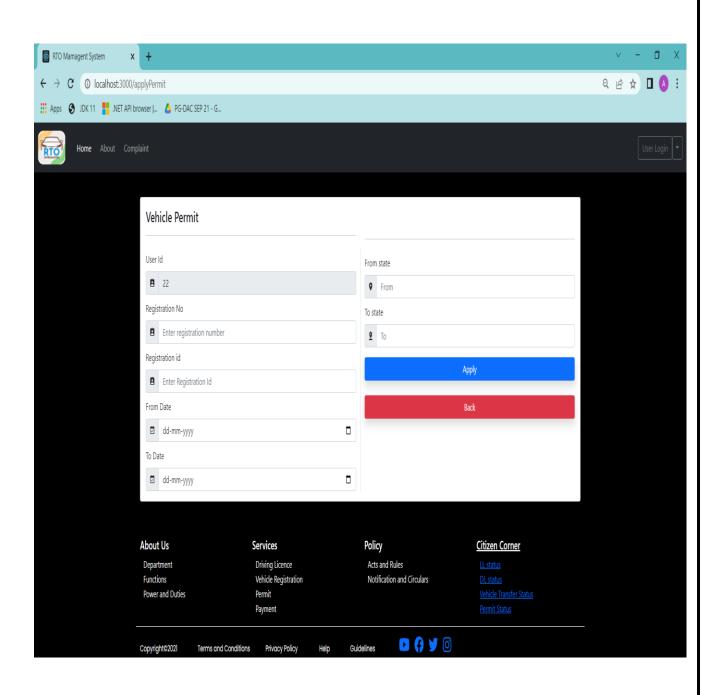


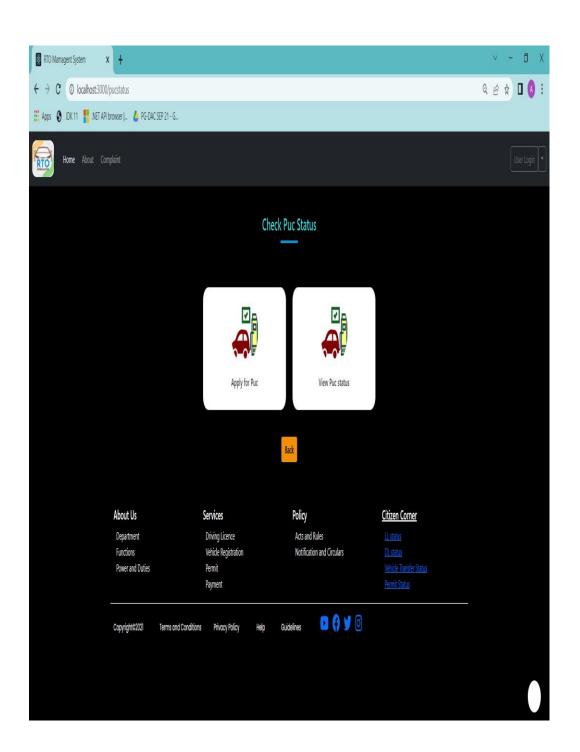


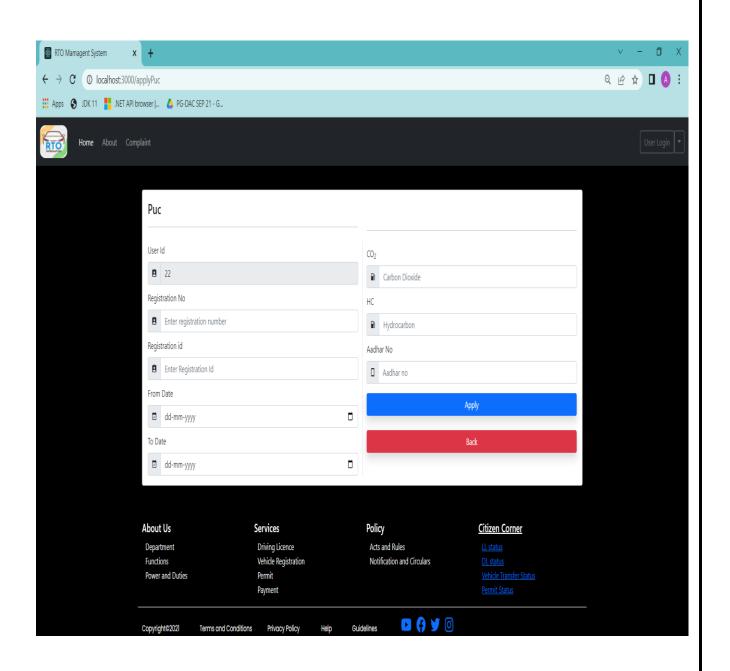


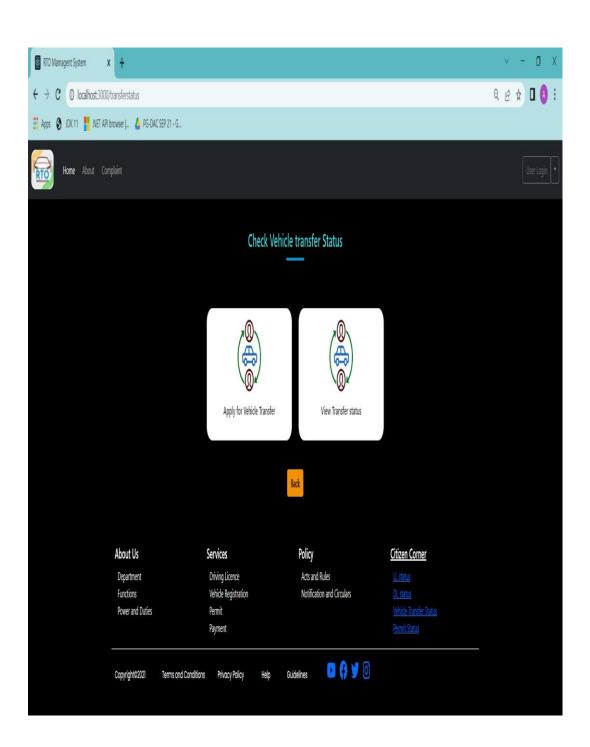


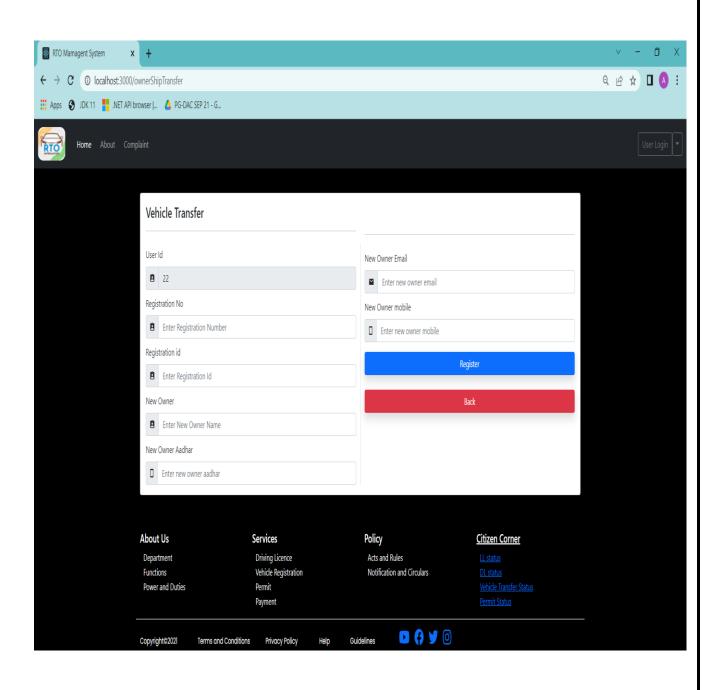


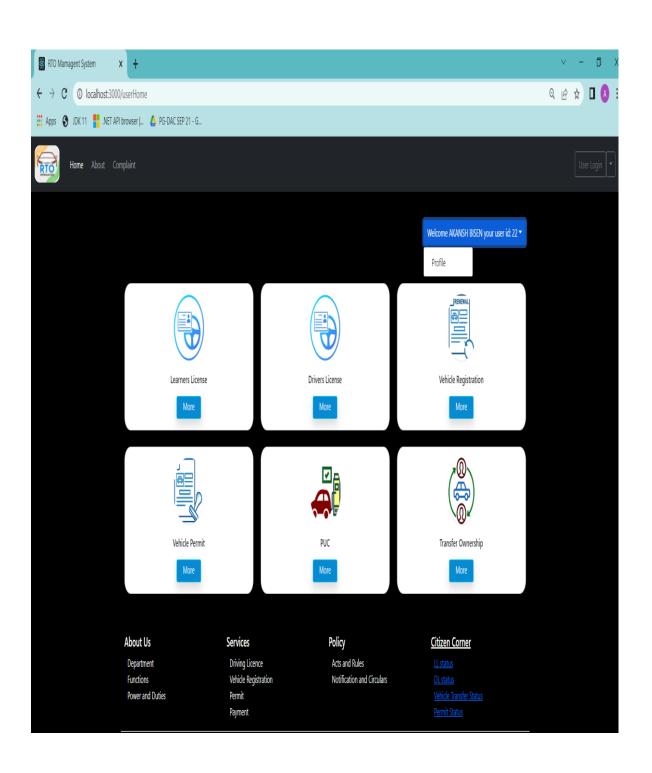


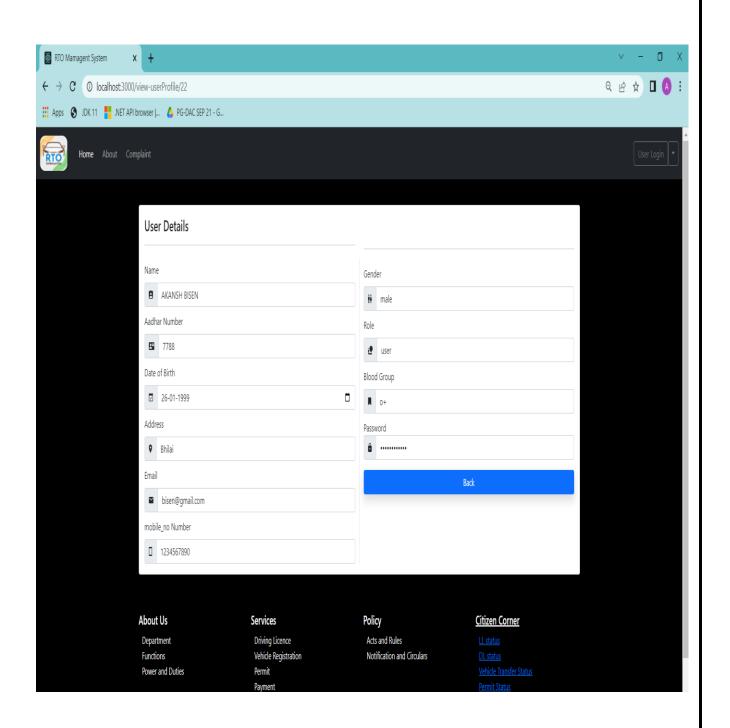


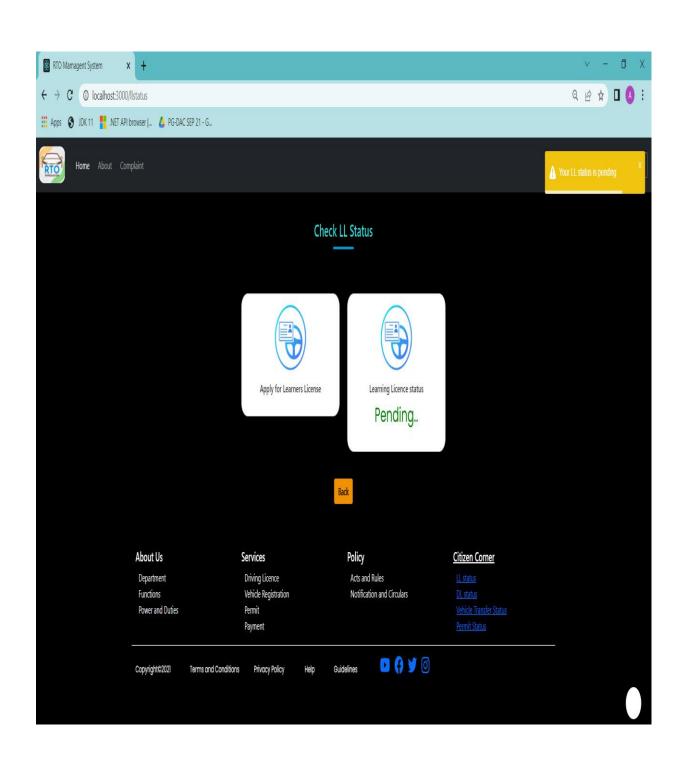


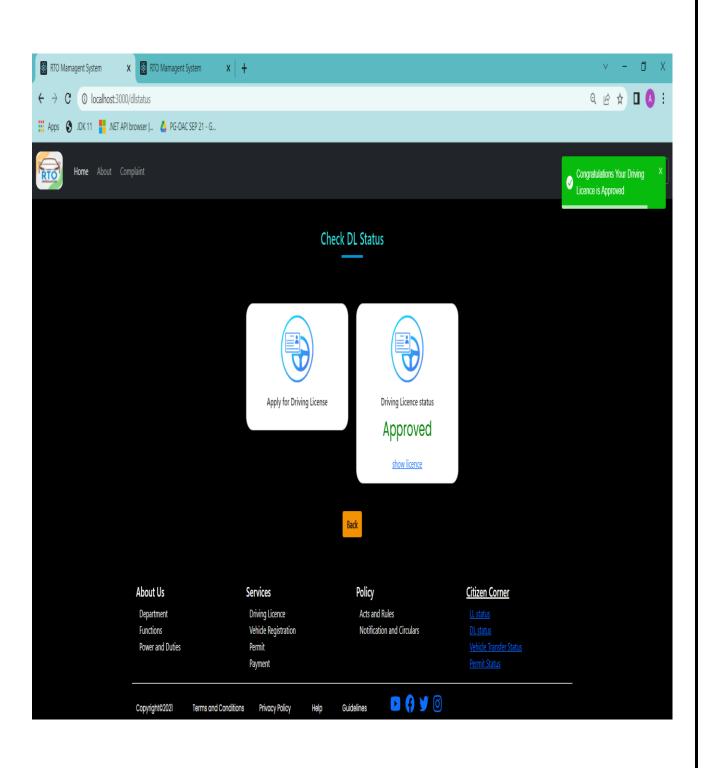


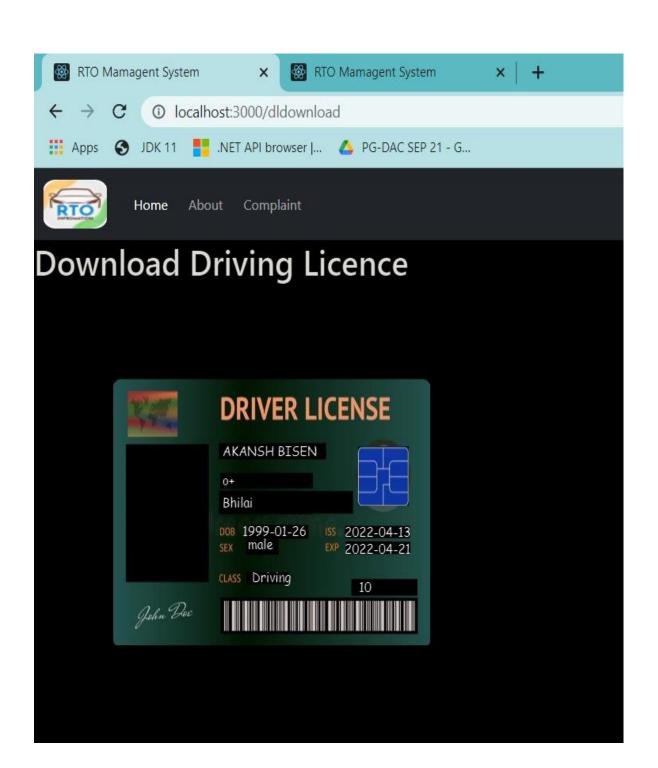


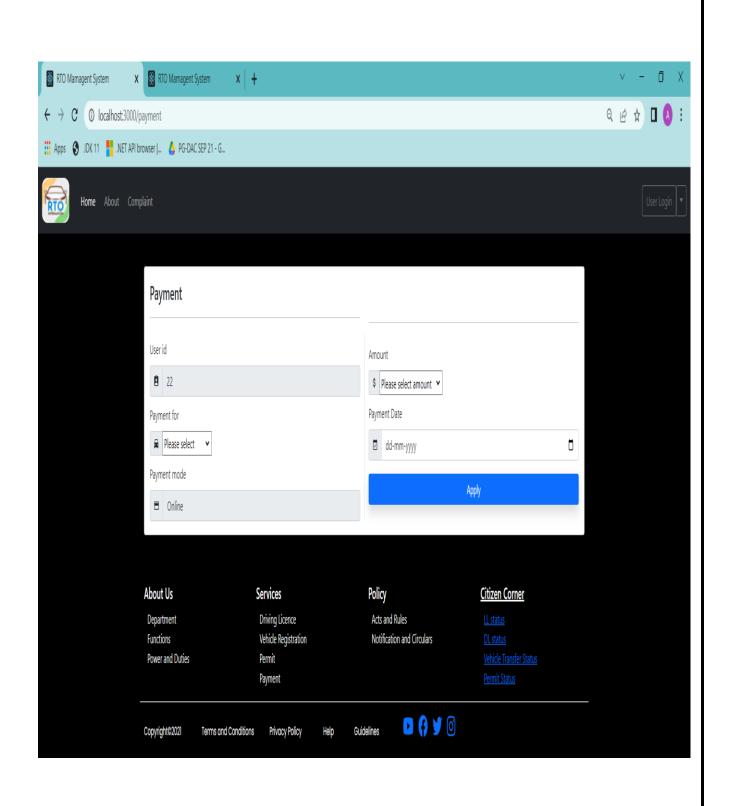


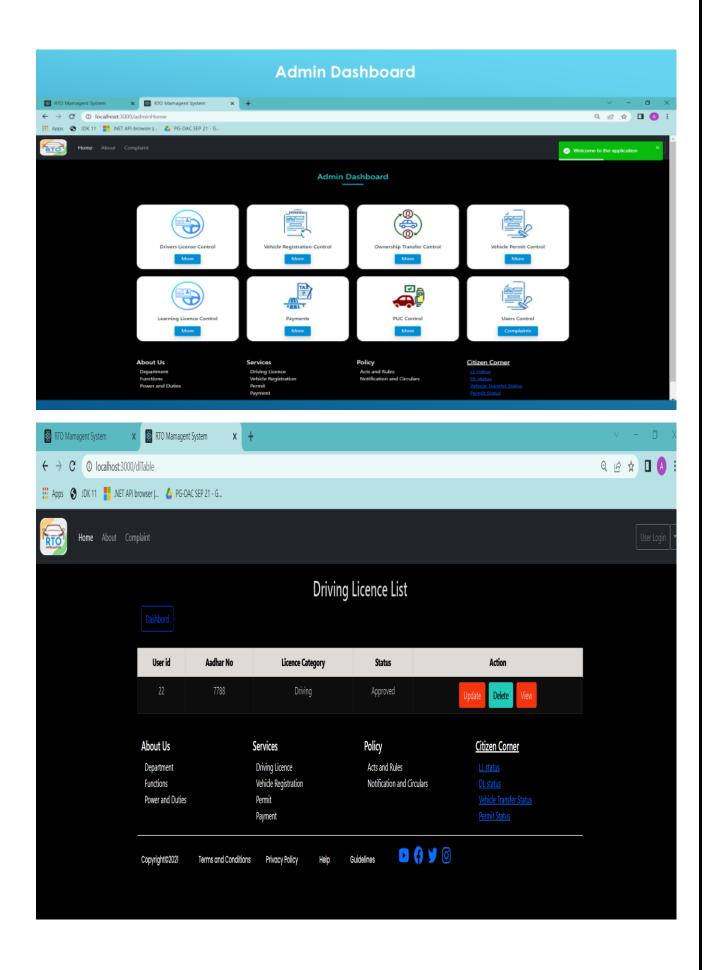


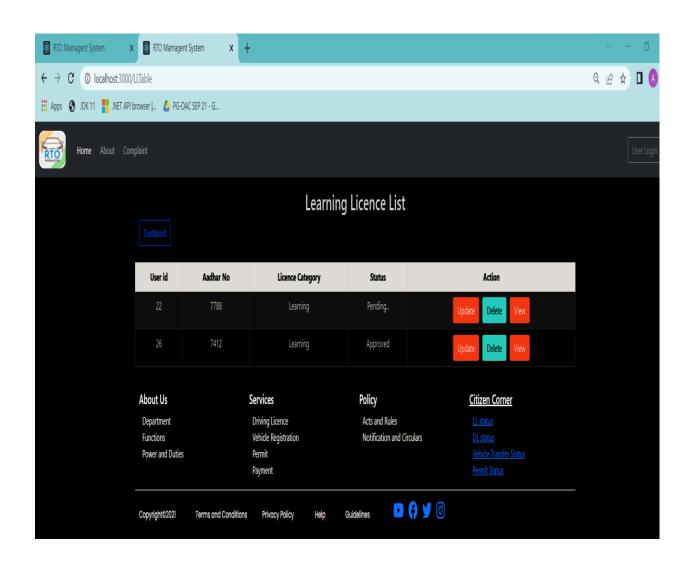




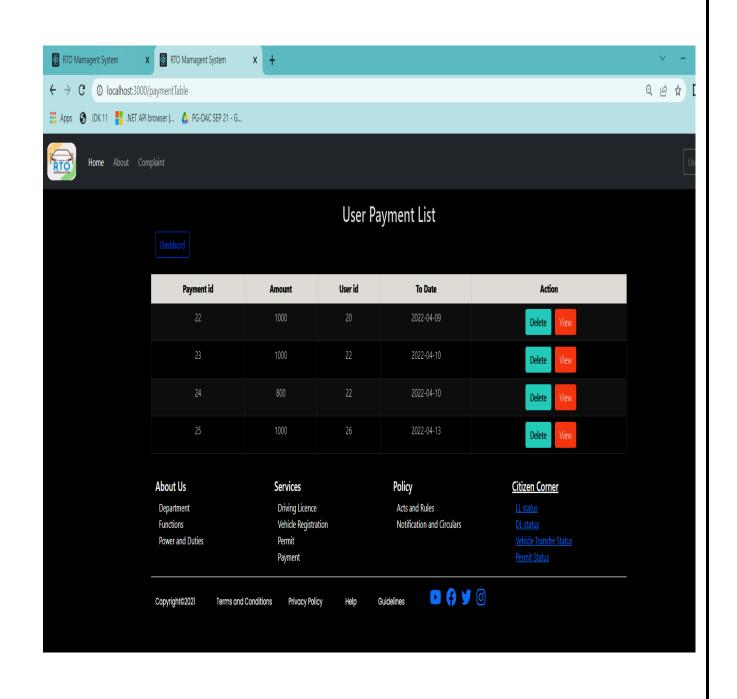




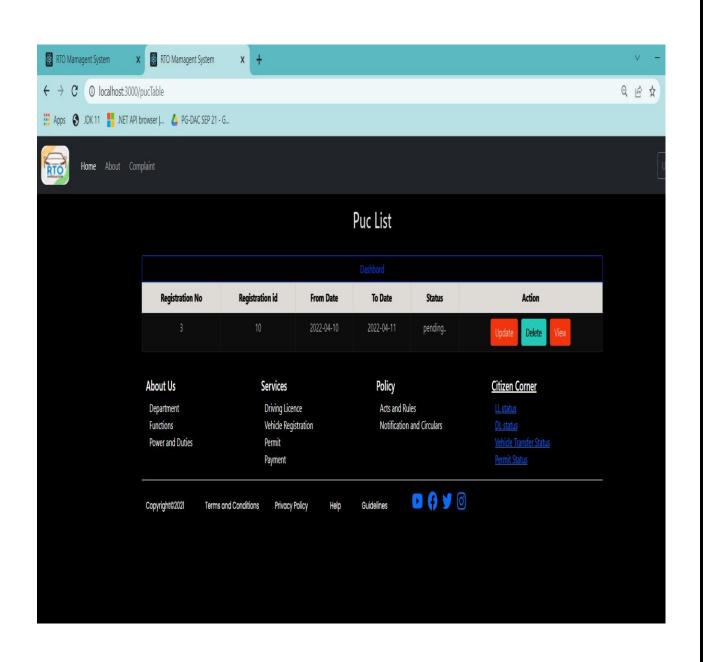


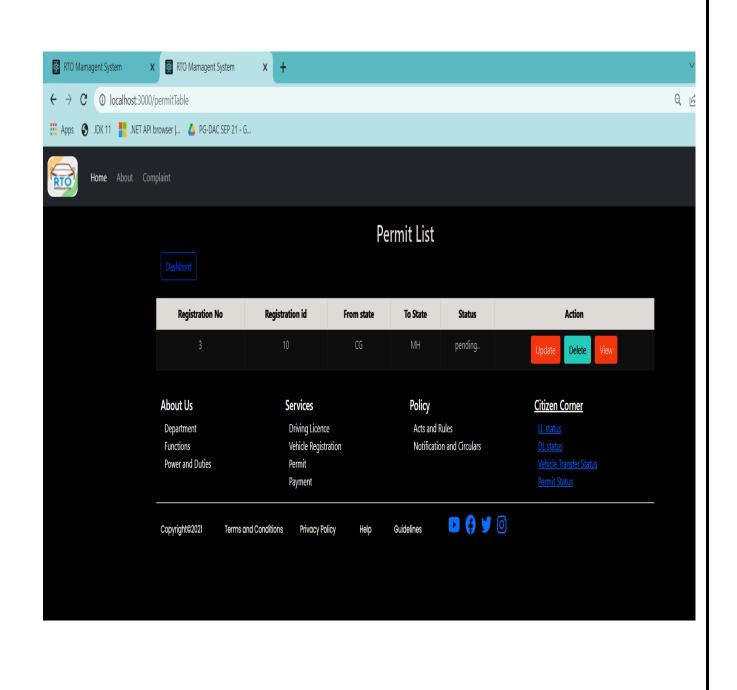


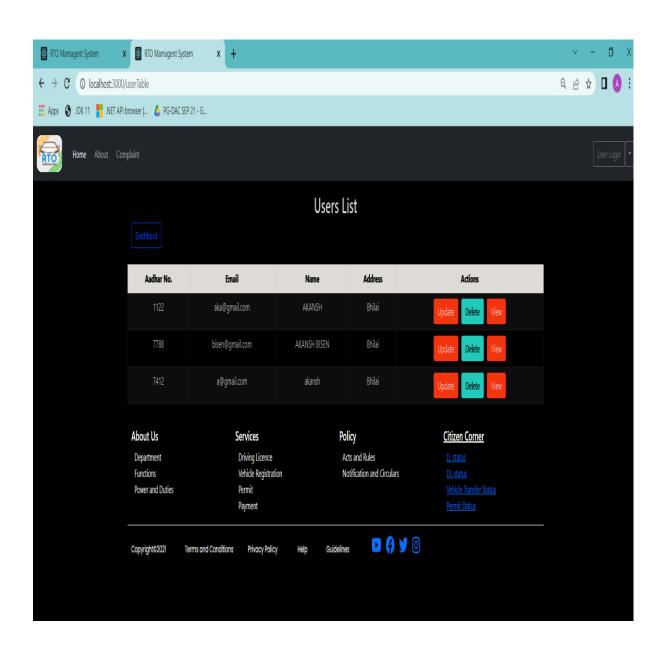


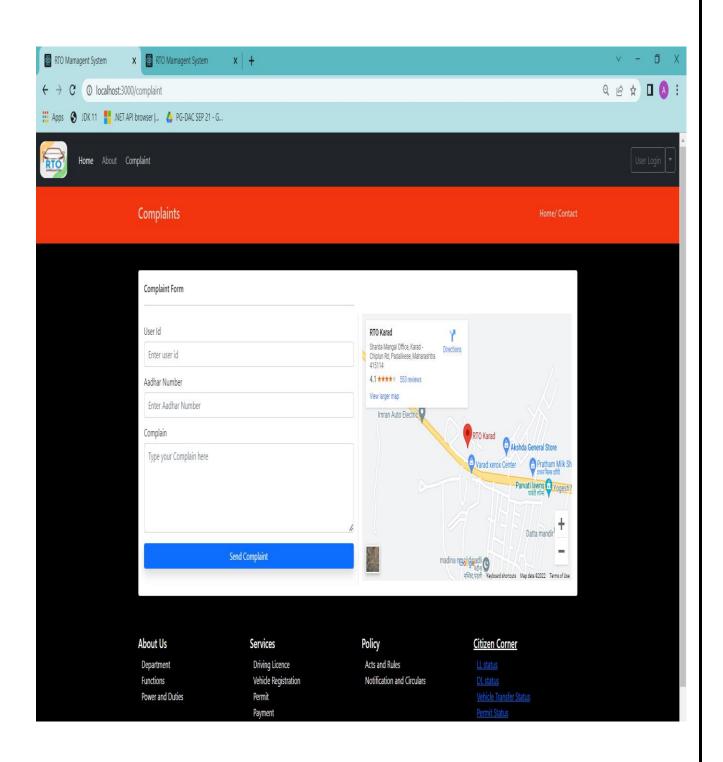


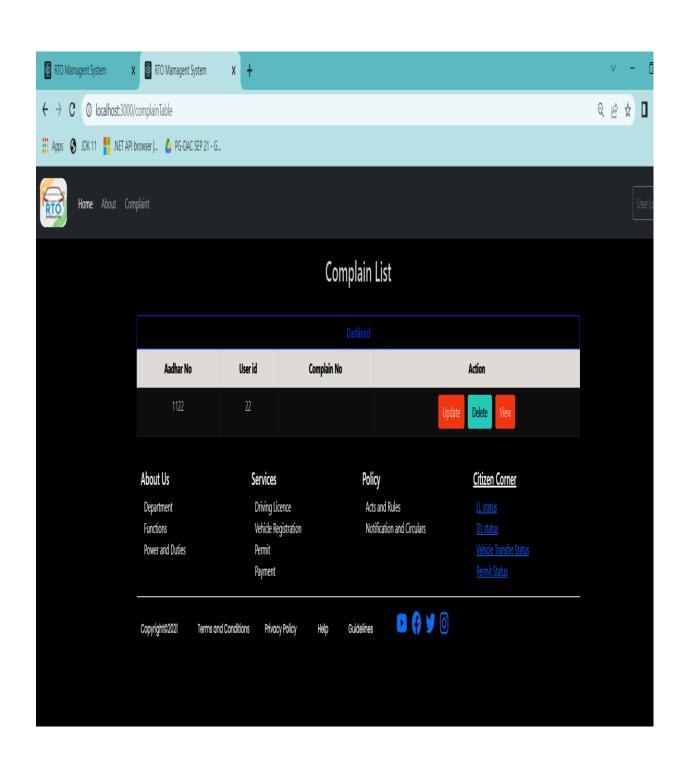












7. Conclusion

Conclusion:

It can be concluded that our project "RTO Management System" which is an Automation of Road Transport Department was successfully developed and tested by our team. Our system introduces a facility for the R.T.O Officers to perform verification of the License and Vehicle documents electronically. It will also help the RTO officials to maintain records systematically and reduces a lot of paper work and manual efforts. We also identified some general requirements of such a system and tried to meet those requirements as much as possible.

Future Scope:

This project can be enhanced further by adding mailing services for each approved functionality, PDF download facility for the users to download their details online without going to RTO office for physical copy. The software is flexible enough to be modified and implemented as per future requirements. We have tried our best to present this free and user—friendly website.

8. References

References:

- https://docs.oracle.com/en/java/javase/11/docs/api/index.html
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- https://www.w3schools.com/
- https://reactjs.org/docs/getting-started.html
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