Database Management System Project

Regional Transport Office (RTO) Management System

FINAL REPORT

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INTRODUCTION

AIM

The Regional Transport Office (RTO) is a government organisation responsible for issuing driving licenses, maintaining databases of vehicles and sells personalised registration of vehicles. It has been observed since years that the RTO is not able to deliver quality public services to the citizen without delay. That is, it has been a difficult job for citizens to get a driving license and to register their vehicles. Hence, this project is aimed at developing a computerised system for the functioning of RTO. This system will reduce the manpower required in the RTO and make the existing system fast and efficient. The aim is to build a user-friendly webpage where the citizens can apply for learner's license, driving license and vehicle registration. The webpage also provides provision for citizens to submit their complaints.

RELEVANCE

The project intends to provide quality services to the citizens of the state. It does so by reducing the delay in services provided by the RTO through computerisation of the system. Imagine if the RTO system was offline based, then the citizens must go to any one of the RTO offices just to apply for learner's license, driving license and vehicle registration. This is not an easy job for citizens and even for the RTO officials too where they must maintain huge amount of offline records. That's the primary reason why the system is computerised. This also reduces the burden on manpower working in the RTO. Since the project is web based, the changes or modifications required by the system over a long term of period can be done very easily. This helps in easy system maintenance and be up to date with the user requirements. That means updating the system as per the user requirements will be an effortless job to the system maintenance group.

Mainly, the website is used for issuing of license. An individual can apply for learning license and driving license online. Accordingly, slots and dates are generated for the respective test. Moreover, this application sends an alert message for renewal of driving license to an individual when his driving license is about to expire. The applications received will be verified and approved by the RTO officials. The applicant can monitor the status of their application and download the approved license. The website also publishes latest news and events conducted by the state transport department.

The system is implemented as 2-tier approach with a backend database handled by the system administrator and a web browser as the front-end client. This document will discuss each of the underlying technologies used to create and implement online RTO management website. To implement this we have used PHP, which is platform independent and therefore, can be run on all major operating systems. PHP provides support to all major servers like Apache and databases like MySQL. Since it uses its own memory, the loading time is decreased and processing time is increased. Next, we have used HTML, JavaScript, CSS and Bootstrap for front-end implementation. They provide a front-end development framework to create fully responsive web pages and define proper styles and presentation of the document. Lastly, MySQL is used as the back-end database since it is one of the most popular open source databases, and it provides fast data access, easy installation and simplicity.

REQUIREMENTS ANALYSIS

The project is an attempt to reduce the delay in the services provided by the RTO offices and it consists of the following users:

1) Citizens, who wants license or want to register their vehicles
2) RTO Inspector
3) RTO Administrator

As the project is an attempt to make the existing RTO system fast and efficient, the built online RTO website provides numerous functionalities makes the job of the RTO officials easier and helps the citizens of the state in the most efficient way. From this, citizens get their job done as soon as possible in a systematic way with no difficulties, whether it may be acquiring license or registering their vehicles or submitting queries. The major functionalities provided by the online RTO website includes:

1) Apply for Learner's License
2) Apply for Driving License
3) Vehicle Registration
4) Application Status check
5) Complaints/query submission
6) Information section
7) Gallery section

The data to be stored include the details of citizens applying for learner's license, driving license, vehicle registration and citizens who submit complaints/queries. The database also stores the information of RTO Inspectors who verify and update the status of learner's license, driving license and vehicle registration.

APPLY FOR LEARNER'S LICENSE

Citizen who craves for a Driving License (DL), starts by applying for a learner's license registration (LLR) through their Aadhaar number and a password which will be used for authentication of the citizen in the future. The system is expected to allow only those citizens who are 18 years old or above for registration. All the minor applicants will be denied of further processing.

Fig 1. LLR entry form page

Once age is verified, the citizen is asked for the category of vehicle (COV) for which he/she wants to apply. After selecting COV, the system will generate an appropriate date, exam ID, exam password and venue for the LLR test. The venue for the test is decided based on the citizen's address and accordingly, the nearest RTO office is assigned as the test venue.

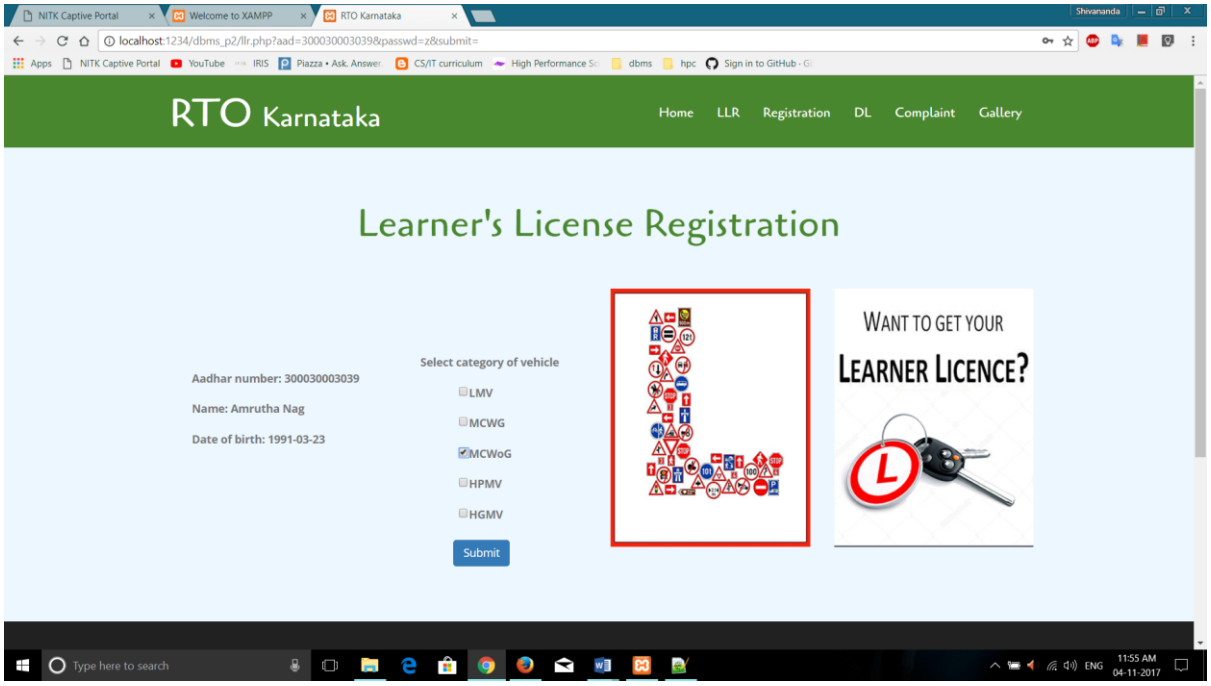


Fig 2. LLR application asks for COV after verification of age

Fig 3. LLR test date, ID, password and venue is generated after selection of COV by the LLR applicant

APPLY FOR DRIVING LICENSE (DL)

To apply for DL, one citizen must wait until his/her LLR is approved by the RTO Inspector. If the citizen fails to pass the LLR test, the LLR of that citizen will be rejected by the RTO Inspector. In that case, the citizen must re-apply for LLR if he/she wants DL. Once the citizen has received his LLR, he/she can apply for driving license, again through their Aadhaar number and a password as in the case of LLR. The system will check whether the LLR issued period is more one month and less than six months or not. If the LLR issued period is less than one month, the citizen will be asked to wait till one month completes.

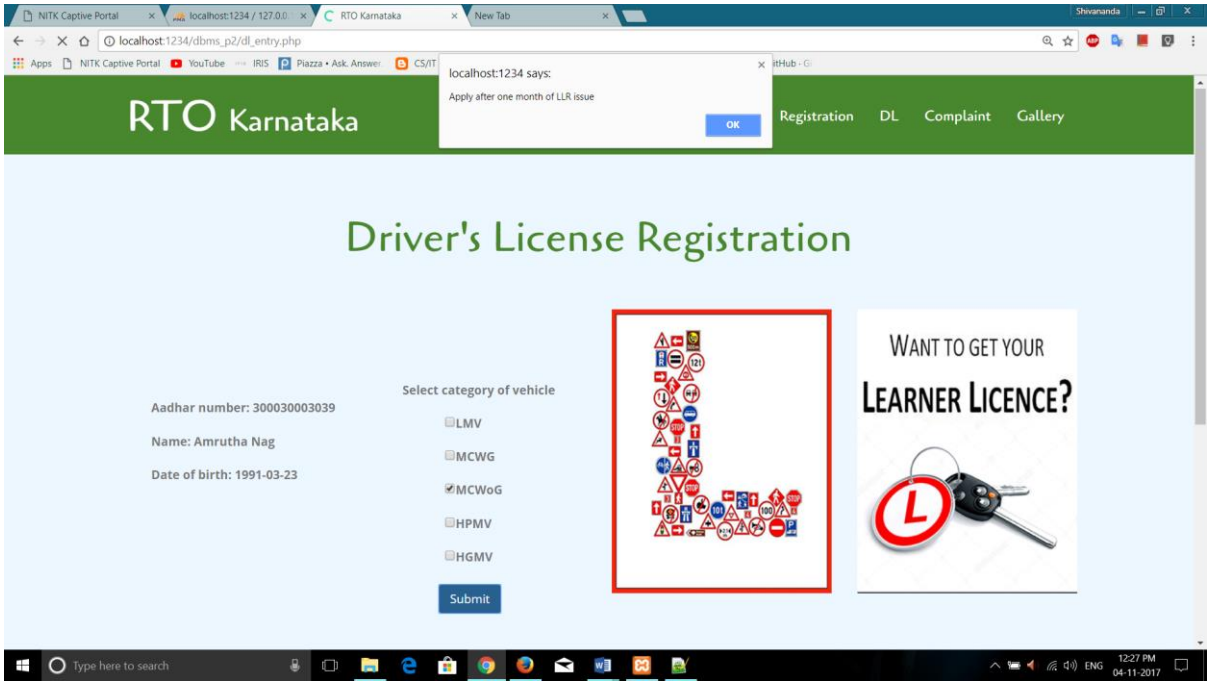


Fig 4. If LLR issued period is less than one month, asks the DL applicant to wait for one month

If the LLR issued period is more than six months, the system will ask the citizen to re-apply for LLR. On a legitimate time of the LLR, the citizen will be asked for the COV to match whether LLR has been issued for the same COV for which the citizen is applying driving license for. On a correct match, the system will generate the test date, test ID and test venue. In this case also, the venue for the test is decided based on the citizen's address and accordingly, the nearest RTO office is assigned as the test venue.

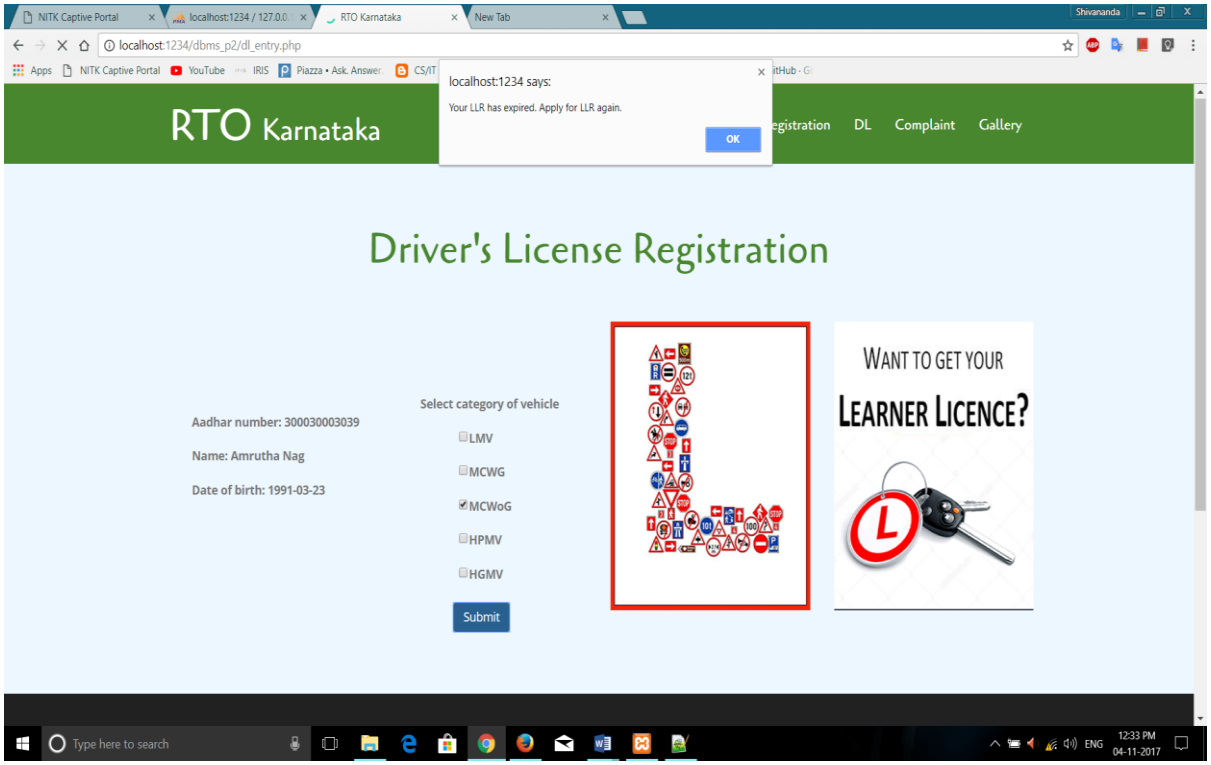


Fig 5. If LLR is expired, asks the DL applicant to re-apply for LLR

Fig 6. On legitimate period of LLR, appropriate DL test date, ID and venue is generated

VEHICLE REGISTRATION

This section is for the citizens to register their newly bought vehicles. The citizen will be asked to apply through their Aadhaar number and a password to be used for authentication. The citizen will be asked to submit the details of the vehicle such as the category of vehicle, vehicle company and the vehicle model. After the details are entered, the system will generate an appropriate date for the documents verification at the nearest RTO office.

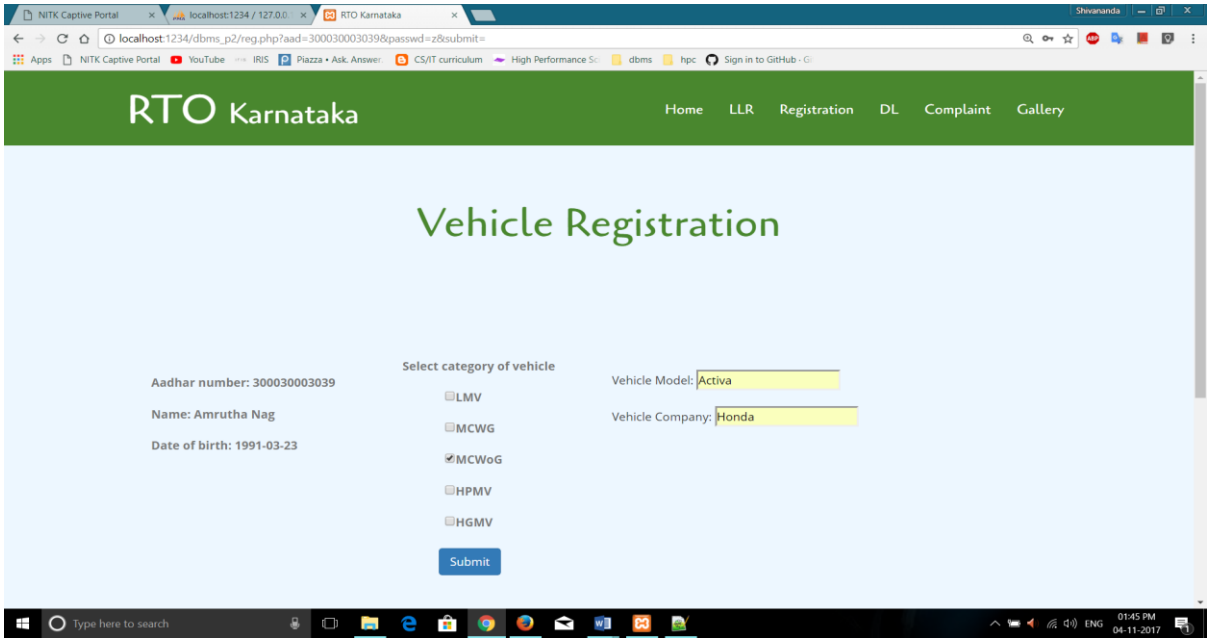


Fig 7. Applicant will be asked to submit COV, vehicle model and company

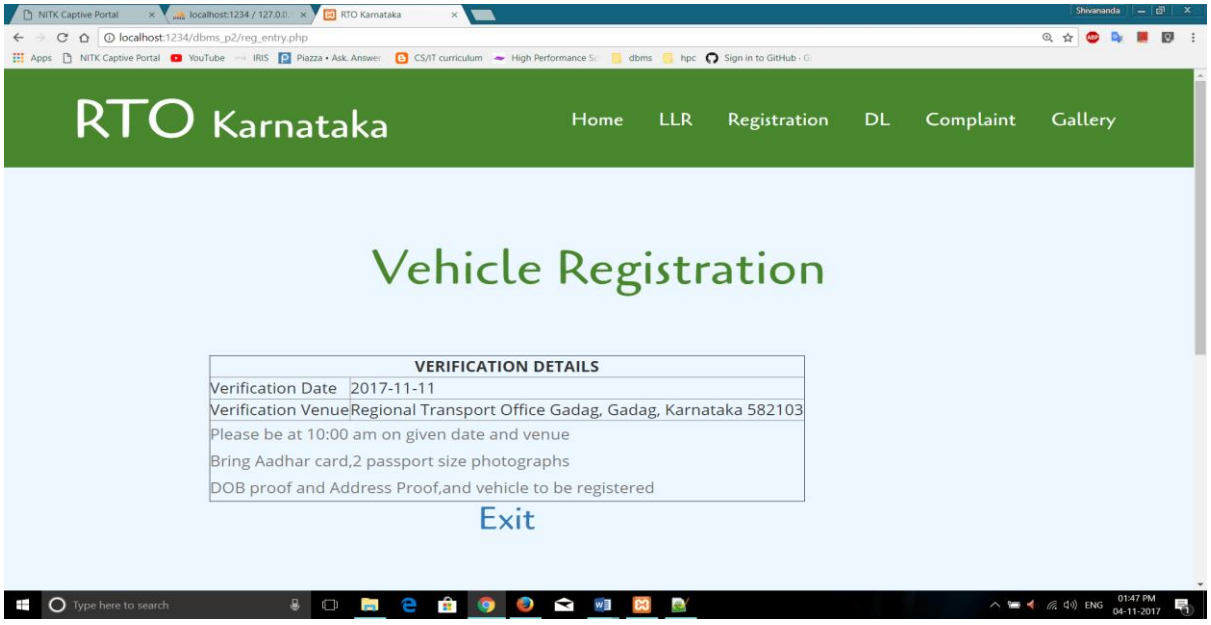


Fig 8. After vehicle details are entered, date and venue are generated

APPLICATION STATUS CHECK

Using this functionality, citizens can monitor the status of their LLR, DL and vehicle registration application whether it is approved or rejected. To check the status, citizen must enter the Aadhaar number and password entered while applying.

In case of LLR, citizen can also download the approved learner's license.

Fig 9. Status of LLR which is approved with a print option

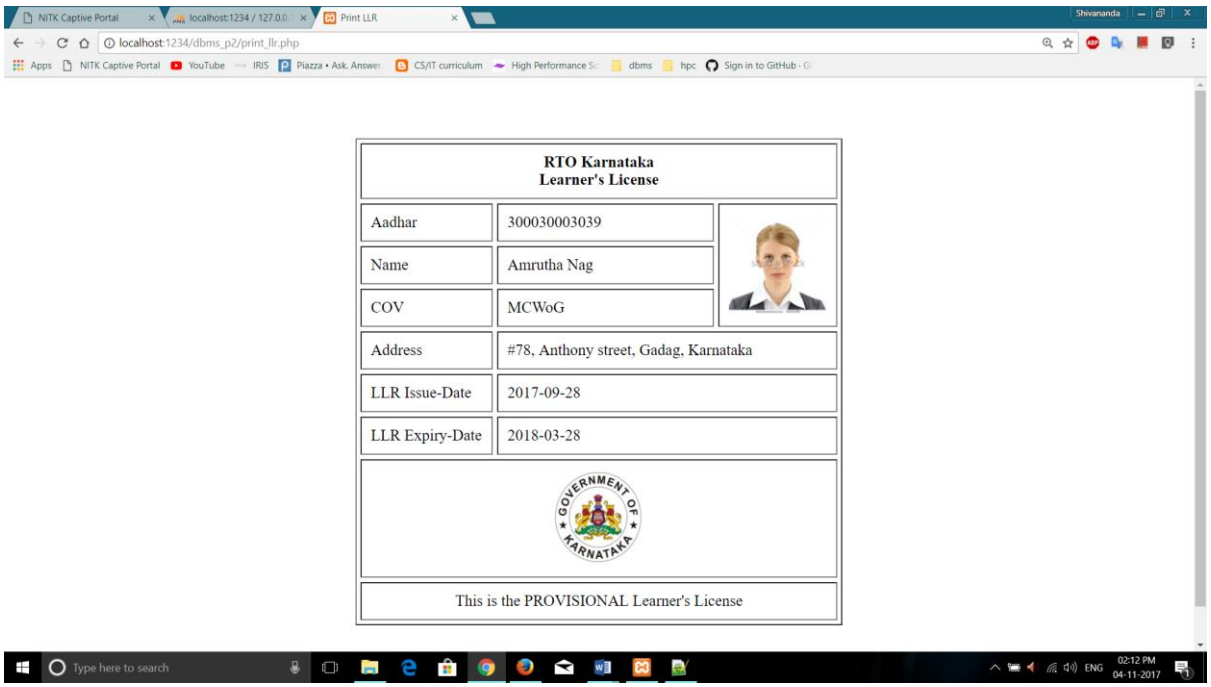


Fig 10. LLR applicant can download the approved learner's license

COMPLAINT SUBMISSION

The complaint submission form allows citizens to submit any complaint regarding the transportation system in the state through Aadhaar number.

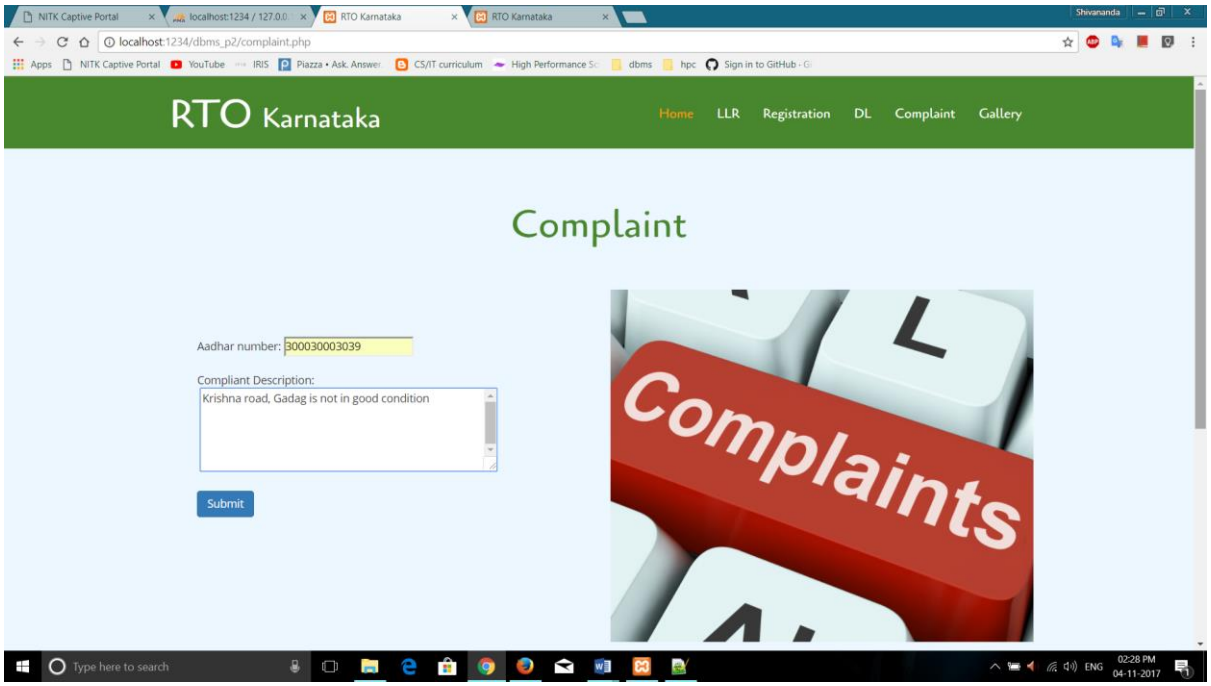


Fig 11. Complaint submission form

INFORMATION SECTION

The website contains an information section where latest news and upcoming events are published.

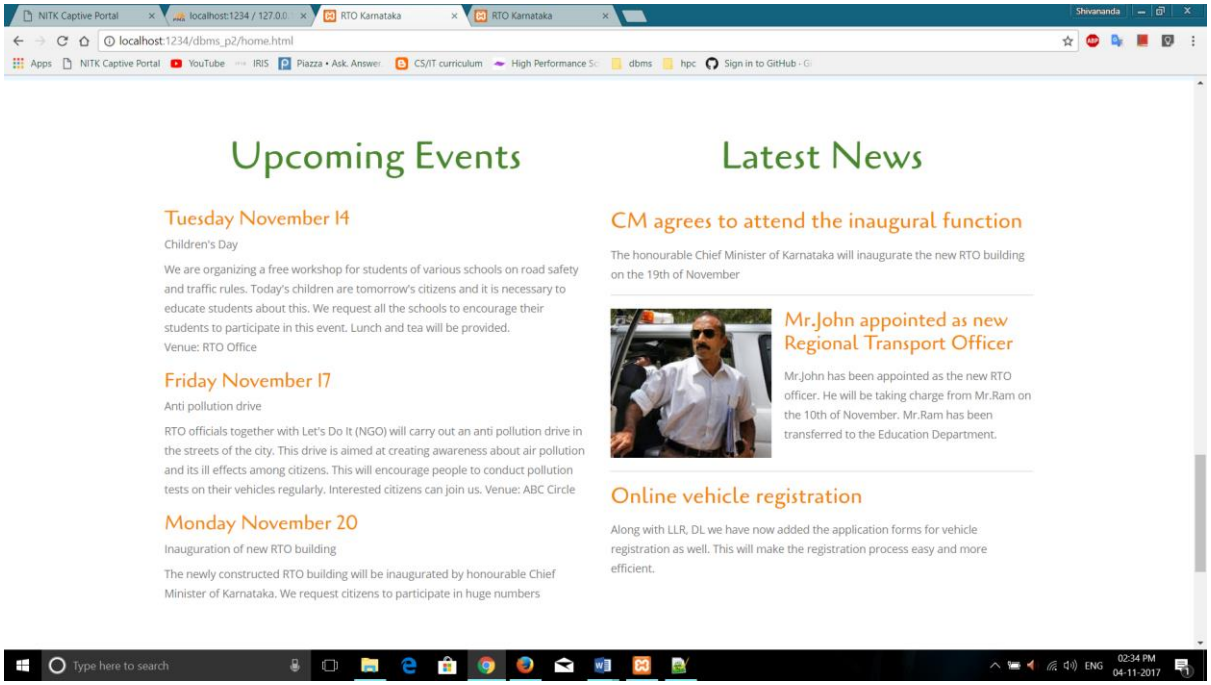


Fig 12. Information section in Home page

GALLERY SECTION

The home page also contains a gallery section where photos of events conducted by the RTO are published.

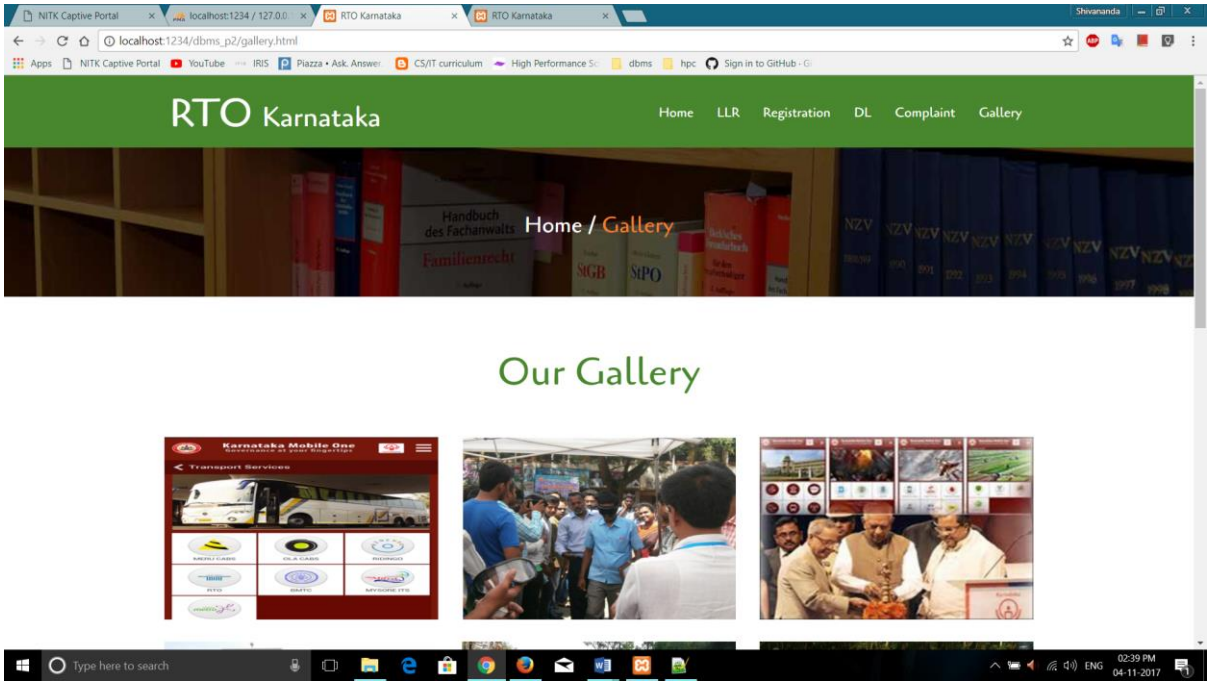


Fig 13. Gallery section of home page

RTO INSPECTOR

The duty of RTO inspectors is to update the status of LLR, DL and vehicle registration applications. Correspondingly, the system has three RTO inspectors, one each for updating the status of LLR, DL and vehicle registration.

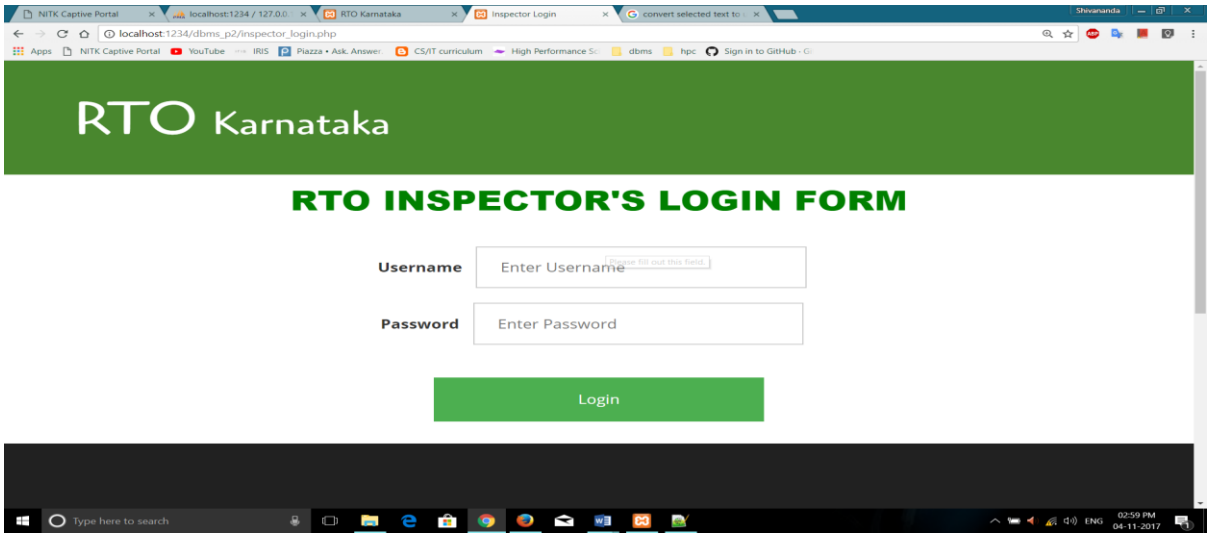


Fig 14. RTO Inspector's Login Form

An LLR Inspector can view the table of applicants who have applied for LLR and update the status of LLR. To update the status of LLR, the LLR inspector will be asked to enter the applicant's Aadhaar number, LLR ID and update status (1 for approval and -1 for rejection). While viewing the LLR table, the inspector can also mail the applicant by clicking on the email link in the table.

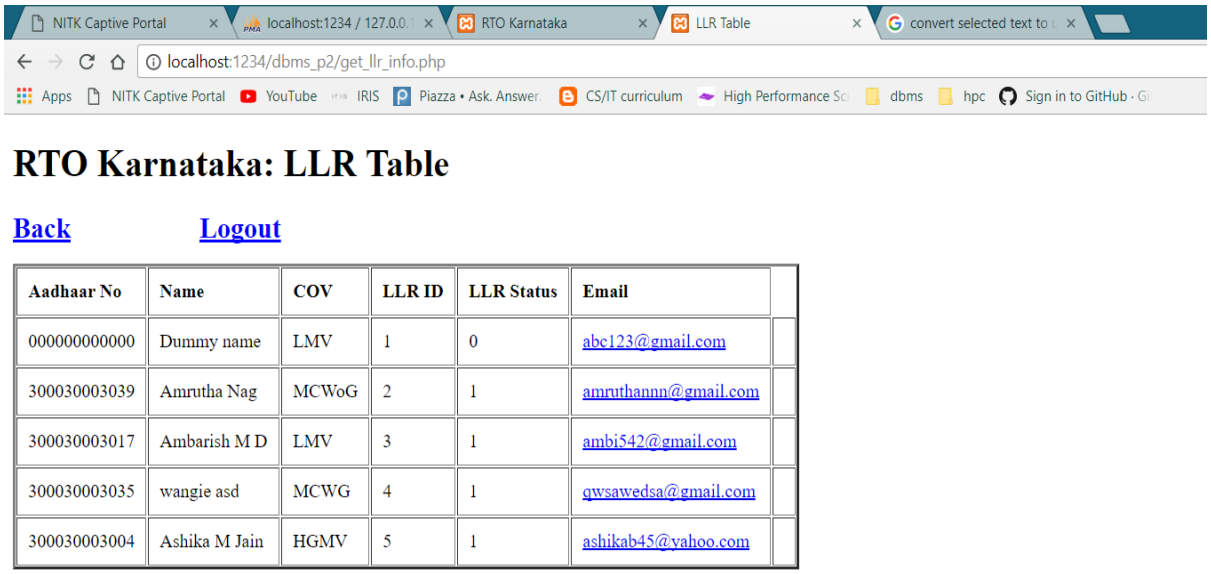


Fig 15. LLR table with an option to mail the applicant

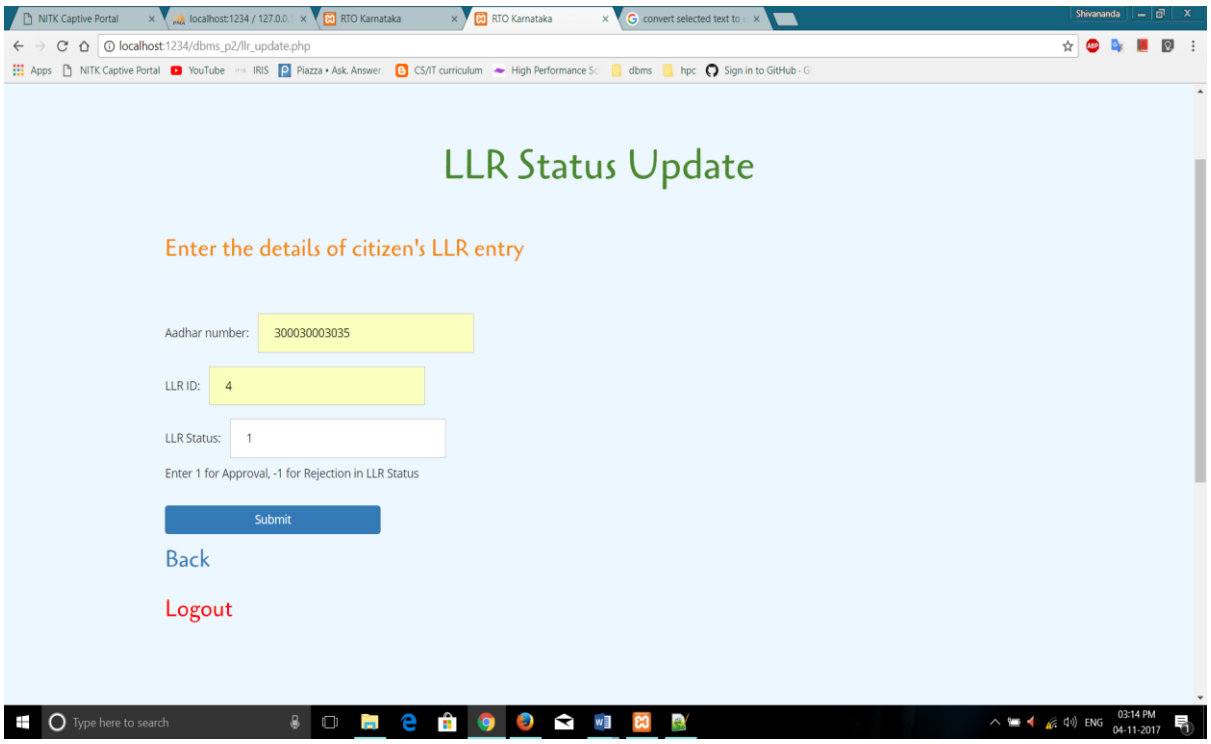


Fig 16. LLR inspector must enter Aadhaar number, LLR ID to update the status

Similarly, in the case of DL status update, the DL inspector must enter the Aadhaar number, DL ID to update the DL status which also applies to updating the vehicle registration status. Both DL inspector and vehicle registration inspector can view respective DL and vehicle registration table with an option to mail the applicant.

RTO ADMINISTRATOR

The administrator will also login using a login page just like RTO Inspector. The list of privileges available to the administrator is shown below in the figure.

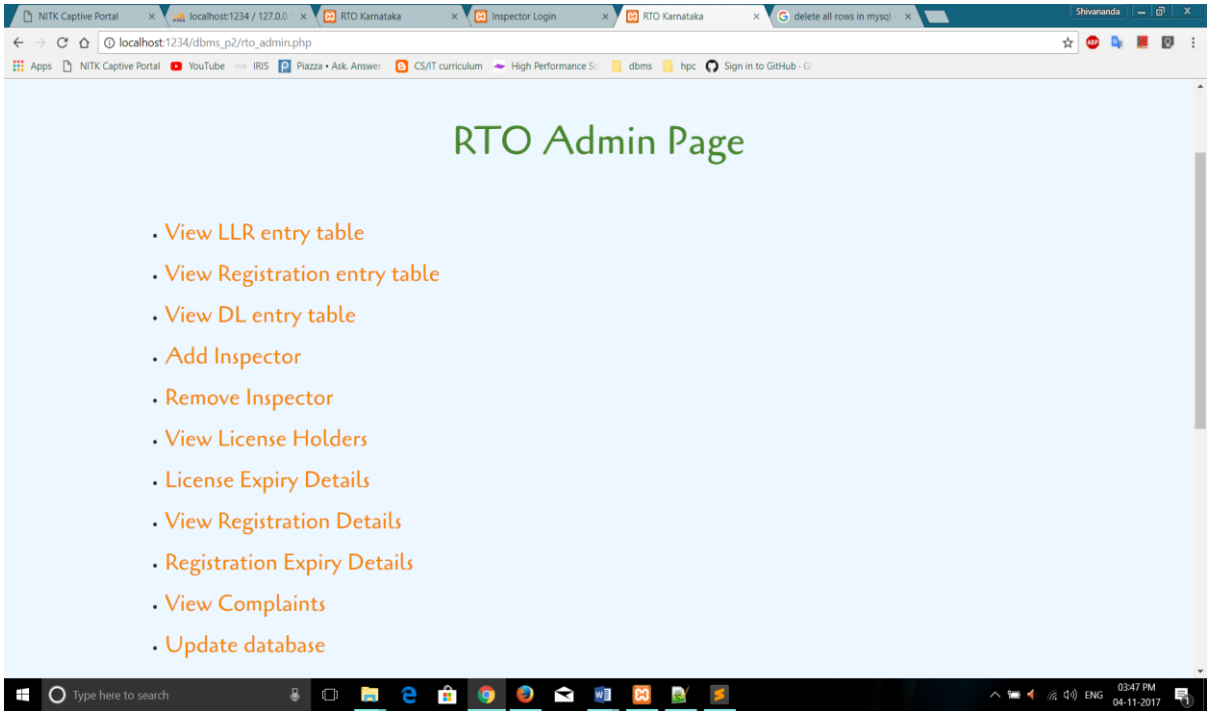
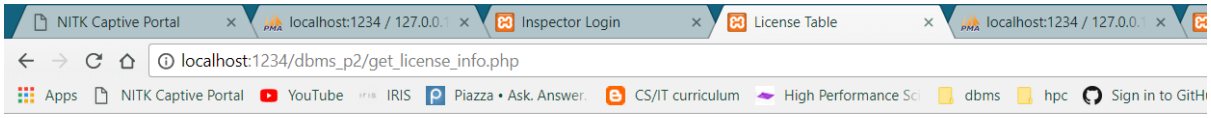


Fig 17. List of privileges available to the RTO administrator

That means, an administrator can view the LLR, DL and vehicle registration entry table. The admin can access the database of driving license holders and the registered vehicles. Prior to one month of the expiry of driving license and RCs book of the vehicle, the administrator will send an alert email to the respective individual. He/she can add new inspectors into the database or remove some of the existing one from the same. When any aspirant has got the driving license successfully, then the administrator will remove his record from the database of LLR or DL to maintain a fresh copy of both database. The update database option will delete the entries of applicants in LLR and DL table who have got the DL. It will also empty the complaints entry in the database.
Whenever the administrator views any table, he/she will have an option to mail the applicants in the table. The administrator can also view complaints.

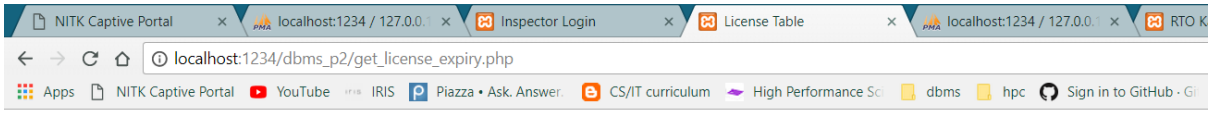


RTO Karnataka: License Holders

Back Logout

Aadhaar No	Name	License No	COV	License Issue Date	Email
000000000000	Dummy name	KA12345678	LMV	0000-00-00	abc123@gmail.com
300030003039	Amrutha Nag	KA12345679	MCWoG	2017-11-04	amruthannn@gmail.com
300030003017	Ambarish M D	KA12345680	LMV	2015-11-29	ambarishmd@gmail.com
300030003026	Nihal Gowda	KA12345681	MCWoG	2017-09-24	nihalgowda@gmail.com
300030003034	Prakash Jain	KA12345682	HGMV	2015-11-20	prakashjain@yahoo.com
300030003043	Amulya R	KA12345688	MCWoG	2016-03-15	amulyar@gmail.com
300030003029	Jagadish Malya	KA12345690	MCWG	2015-11-19	malyajagadish@gmail.com

Fig 18. Admin viewing license holders with option to mail

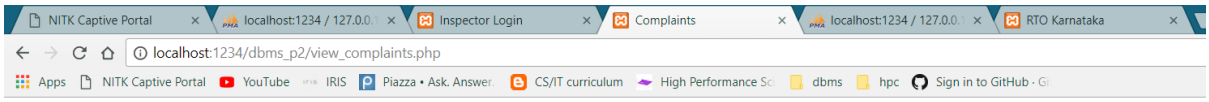


RTO Karnataka: License Holders

Back Logout

Aadhaar No	KWord	License No	COV	License Issue Date	License Expiry Date	Email
300030003017	Ambarish MD	KA12345680	LMV	2015-11-29	2017-11-29	ambarishmd@gmail.com
300030003034	Prakash Jain	KA12345682	HGMV	2015-11-20	2017-11-20	prakashjain@yahoo.com
300030003029	Jagadish Malya	KA12345690	MCWG	2015-11-19	2017-11-19	malyajagadish@gmail.com

Fig 19. Admin viewing license expiry details with option to send alert mail



RTO Karnataka: Complaints Table

Back Logout

Aadhaar No	Name	Complaint Date	Complaint Description	Email
300030003017	Ambarish M D	2017-11-04	Krishna road, Hassan is not in good condition	ambi542@gmail.com
300030003035	wangie asd	2017-11-04	Traffic lights are not working properly in Kempegowda circle, Bangalore	qwsawedsa@gmail.com

Fig 20. Admin viewing complaints submitted with option to mail

DATABASE DESIGN

TABLES CREATED

i. citizen

SNO	NAME	TYPE	DESCRIPTION
1	first_name	VARCHAR (30)	
2	middle_name	VARCHAR (30)	
3	last_name	VARCHAR (30)	
4	aadhar	CHAR (12)	Primary Key
5	gender	CHAR (1)	
6	dob	DATE	
7	phone_no	CHAR (10)	
8	mail_id	VARCHAR (50)	

ii. address

SNO	NAME	TYPE	DESCRIPTION
1	aadhar	CHAR (12)	Primary key, Foreign key
2	street	VARCHAR (100)	
3	city	VARCHAR (30)	
4	state	VARCHAR (20)	

iii. offices

SNO	NAME	TYPE	DESCRIPTION
1	district	VARCHAR (30)	Primary key
2	rto_address	VARCHAR (200)	

iv. inspector

SNO	NAME	TYPE	DESCRIPTION
1	id	INT	Primary Key
2	username	VARCHAR (50)	
3	password	VARCHAR (100)	
4	privilege	VARCHAR (5)	

v. llr

SNO	NAME	TYPE	DESCRIPTION
1	aadhar	CHAR (20)	Foreign Key
2	name	VARCHAR (50)	
3	cov	VARCHAR (20)	
4	edate	DATE	
5	eid	VARCHAR (10)	
6	llr_id	INT	Primary Key
7	epwd	CHAR (10)	
8	passwd	VARCHAR (50)	
9	mail_id	VARCHAR (50)	
10	llr_status	INT	
11	llr_issue_date	DATE	

vi. reg

SNO	NAME	TYPE	DESCRIPTION
1	aadhar	CHAR (12)	Foreign key
2	name	VARCHAR (50)	
3	cov	VARCHAR (30)	
4	model	VARCHAR (20)	
5	company	VARCHAR (20)	
6	rdate	DATE	
7	r_id	INT	Primary key
8	passwd	VARCHAR (30)	
9	mail_id	VARCHAR (50)	
10	reg_status	INT	
11	reg_issue_date	DATE	
12	vno	VARCHAR (20)	
13	reg_expiry_date	DATE	

vii. dl

SNO	NAME	TYPE	DESCRIPTION
1	aadhar	CHAR (12)	Foreign Key
2	name	VARCHAR (50)	
3	cov	VARCHAR (20)	
4	edate	DATE	
5	eid	VARCHAR (10)	
6	dl_id	INT	Primary key
7	passwd	VARCHAR (50)	
8	mail_id	VARCHAR (50)	
9	dl_status	INT	
10	dl_issue_date	DATE	

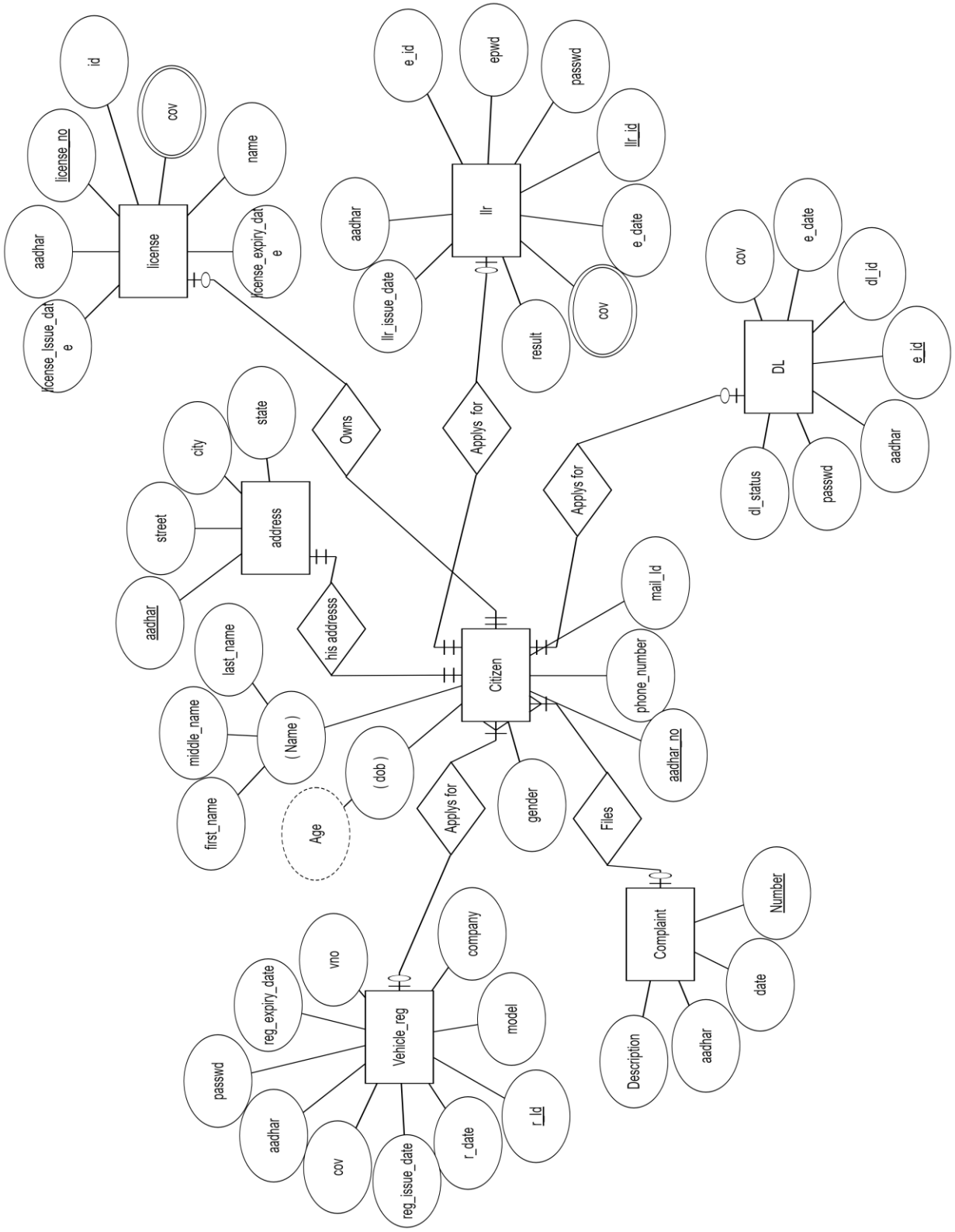
viii. license

SNO	NAME	TYPE	DESCRIPTION
1	id	INT	Primary Key
2	aadhar	CHAR (12)	Primary Key, Foreign key
3	name	VARCHAR (50)	
4	license_no	VARCHAR (20)	
5	cov	VARCHAR (20)	
6	license_issue_date	DATE	
7	license_expiry_date	DATE	
8	mail_id	VARCHAR (50)	

ix. complaint

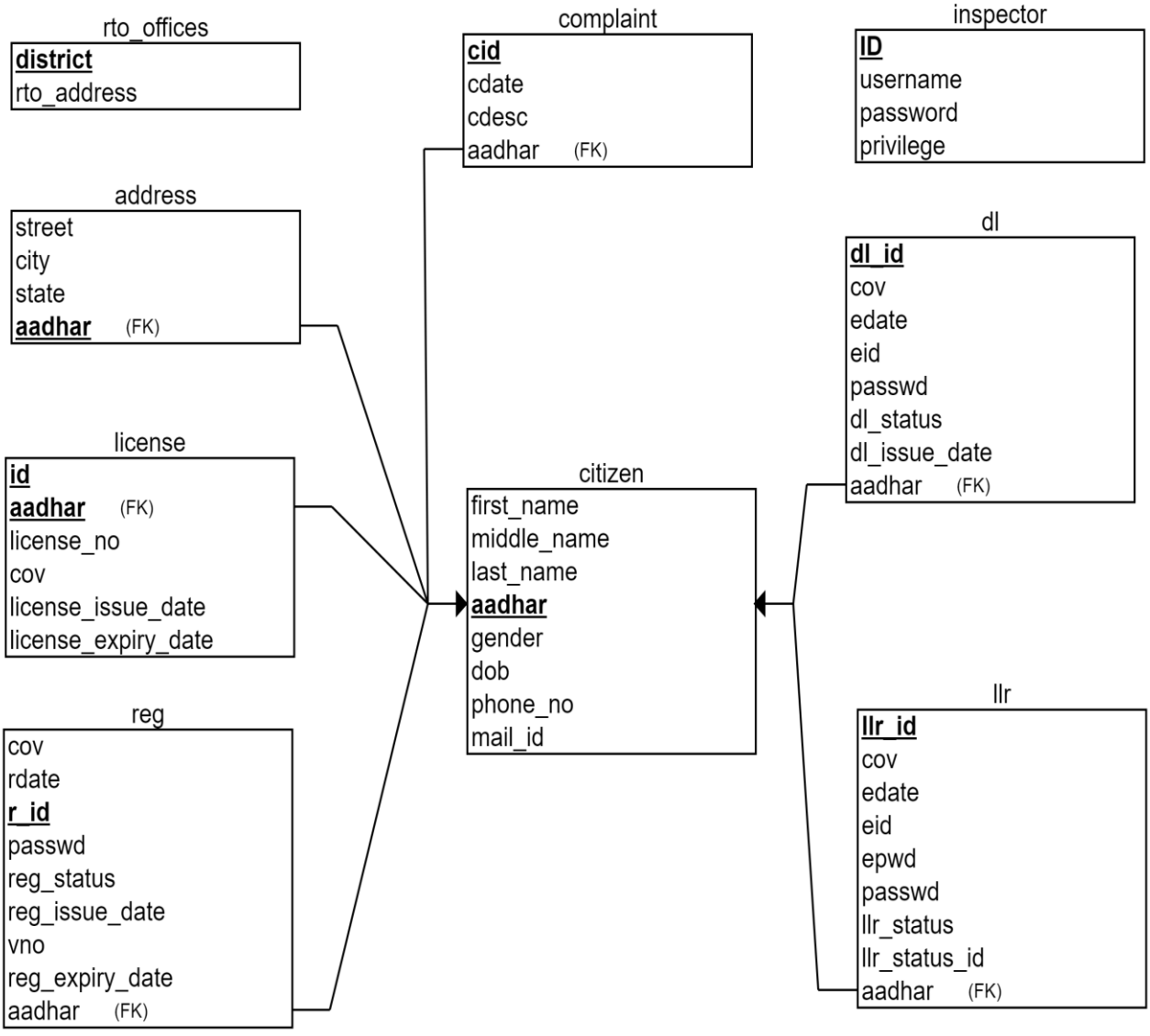
SNO	NAME	TYPE	DESCRIPTION
1	aadhar	CHAR (12)	Foreign Key
2	cdate	DATE	
3	cdesc	TEXT	
4	cid	INT	Primary key

ER DIAGRAM (Rotate to see the diagram)
(Tool used: ERDPlus)



RELATION SCHEMA

(Tool used: ERDPlus)



IMPLEMENTATION

The whole project development was divided into two parts, the front-end development and the backend development. The front-end development was creating the RTO website with user-friendly interface. The backend development was to access the database stored on the server side and updating the same. In this project, MySQL is used as the backend database. We have used HTML, CSS, JavaScript, Bootstrap for the front-end implementation. Next, PHP is used as server scripting language to access the database and update it.

The project is run on a local machine with the help of XAMPP application which provides Apache HTTP server and MySQL as the backend database. The database is accessed and updated using the MySQL queries in PHP scripts. The MySQL queries used to implement the project include SELECT, INSERT, DELETE, UPDATE and JOIN.

CONCLUSION

The implemented project RTO Management System brings out an improvement over the existing RTO system by reducing the processing delay and allowing RTO to provide quality of service to the citizen. It overall increases the efficiency of the RTO office and effectively reduces the burden on the RTO officials. People need not stand in long queues just to apply for LLR or DL at RTO offices. All this pre-registration task can be done online through the implemented system. Any doubts or queries can be submitted which will be responded by the officials. This project even eliminates the presence of middle man from the entire process and thereby decreasing the degree of corruption in the state. The other ways in which the system helps is by publishing the latest news and events. The project is mainly built using web scripting languages. So, in the future, updating the system or adding extra features to the system as per the requirements will not be difficult as simple web scripting languages will help us in accomplishing it.

GitHub link: https://github.com/Shivananda199/RTO-Management-System