Traffic Police Management and Detection of Stolen Vehicle using QR Code

Shubham Aher [1], Asawari Amparwar[2], Anushka Suryavanshi[3], Tanuj Ahirrao[4], B R Quazi[5]

[1-4]*Department of Computer Engineering, AISSMS College of Engineering, Pune - 01, Maharashtra, India*
[5]*Assitant Professor, Department of Computer Engineering, AISSMS College of Engineering, Pune – 01, Maharashtra, India*

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Abstract - *In India, thousands of vehicles get stolen on a daily basis; tracking and attending all such cases is not possible for the police department due to lack of information and resources [1]. In addition, people chose to have their own vehicles and daily hundreds of vehicles are registered newly. The vehicles carry with it a lot of customer's confidential documents [2]. The customer needs to carry these documents everywhere they go, due to which number of problems arise on the part of customers as well as RTO or Police department [3]. Another drawback of the manual document verification is that it can be lost due to stealing or there is a high risk that the documents can get damaged when carried in rainy weather [4]. The stealing as well as damage can lead the customers to reapply for the documents which can be an added overhead for them [5]. The existing system comes with lots of flaws and some unmanageable circumstances. The existing manual verification process is inefficient most of the time. The maintenance of hard copy of all the documents and the need of carrying for verification adds to daily hectic of life. This project aims at implementing a vehicle document check system where documents are retrieved by traffic police by their smart phones and the need of carrying the physical documents is not required which can save a lot of time and in good management of service [6].*

Key Words: QR code, Encoder, Decoder, E-RTO, Authentication, Road Transport Activity, Vehicle Verification

1. INTRODUCTION

Due to increased demand in the private vehicles the number of vehicles running on the roads have significantly increased over recent years. In the process of following traffic rules, the owner of the vehicle has to carry the vehicle's physical documents wherever they go. At various instances when the document verification has to be done, the officials have to check the documents thoroughly which can take a lot of time resulting in a lot of overhead. In the population as big as our country, verification of each and every vehicle is not possible. The police at some instances also have a tendency to bribe which leads to corruption in India. Not only this, the retrieval of stolen vehicles is one of the biggest issues in traffic policing. The nameplates and the information associated with the actual owner of the vehicles can be manipulated and breached.

The potential solution to overcome all the above problems is through QR code technology. Quick response is matrix barcode or two-dimensional barcode which is reliable and a secure way of storing and retrieving confidential data involved in the proposed system [1].

The proposed system replaces the current manual document verification for checking the vehicle documentary through police [1]. An Android plus web application will be beneficial in overcoming the problem of carrying the physical documents for verification.

When any vehicle is newly purchased, documents associated with the vehicles are scanned and stored in the database. This database is the commonly shared database between RTO/ Police department and Showroom. Using the information, a unique code for each vehicle is generated. The code can be placed on any visible place on the car. The Android application comes into picture when the code is to be scanned and the owner's associated documents are retrieved and verified. This system framework works equally well for finding a stolen vehicle [2].

2. LITERATURE SURVEY

Authors in [1] suggested smart RTO & web application consist of web application for RTO administrator and the android application for the user. The user has to register for the services like insurance, license, PUC & RC book. If the traffic police stop driver and asks for various vehicle documents the driver had to tell him the license number manually and the traffic police will enter the details in his android app and the data stored on the server will be fetched regarding the documents. It influenced by RTO management system. This information was stored in database at server through on inline registration and server-side end is in MYSQL. On client side an android app was provided to traffic police. After police logins into the system was able retrieve vehicle and license related information from the database of RTO. If authentication fails, the information is provided to the police to retry otherwise information about the use is displayed.

[2] describes E-RTO is an advanced "E-RTO management System" which is mainly design keeping in view to make the existing registration and insurance process easier and faster. It includes the entire registration procedure starting from the initial phase of entering till the result. Also, security was

provided in those intermediate stages starting from the receiving of the application to revealing the applicant's number along with expiry date of license are being dealt. Administrator was provided for authentication as well as it could handle all the database of E-RTO and manages all the process. He had rights to approve learning license number, permanent license number, pass the vehicle registration number and offer insurance details to the user etc. Facilities were provided by the administrator.

In [3] author had a survey about problem of RTO, RTO employees have lot of work burden of making registration, license issue, transfer etc., which requires lots of paper work and hectic manual process. As a result, people cannot get things done in right time, this system is very helpful for RTO officials to maintain record systematically, efficiently and reduces lots of paper work and manual effort.

From [4], technique has been discussed for challan system. Here user provide details to RTO database. By scanning QR code which contains overall information of the vehicle we get all vehicle owner details. This system also detects culprit vehicle.

Author in [5] puts forward some technical and research solutions for outdoor and indoor location calculation. Data quality control and work performance measurement done efficiently. The efficiency of the system is demonstrated in one City Traffic Management, helping governments to better regulate traffic operation.

3. PROPOSED SYSTEM MODEL

The proposed diagram displaying the how system is going to work. Figure 1 describes the suggested system architecture diagram [1].
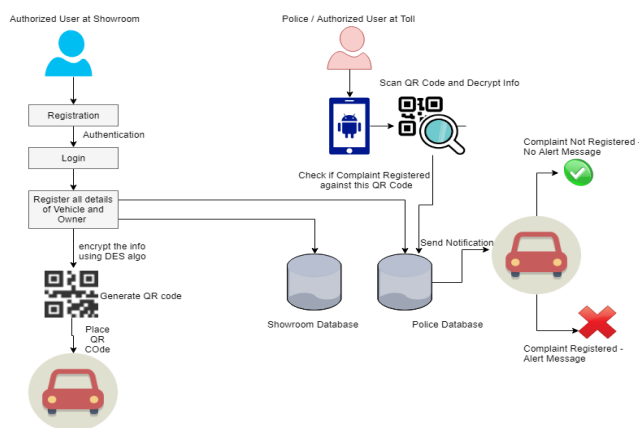

Fig., 1. Proposed System Model

We are proposing an application that replaces the current manual processes for checking the vehicle documentary through police. User side suitable to carry documents. We are designing an Android + web application named Traffic Police Management which will be beneficial for peoples to help for do not carry documents of vehicle and maintained

the document. Initially we assign them with unique identity numbers and scan their RC, Insurance, Emission paper, vehicle name, and number and store it in the database at the back end. Using the above information, we generate a unique code and stick it on an irreplaceable part of the vehicle. At the front end we are going to create an application with which traffic police can scan the code on his phone and all the details about the owner of the vehicle and all the documents earlier stored will be shown on the users mobile.

Fig. 2
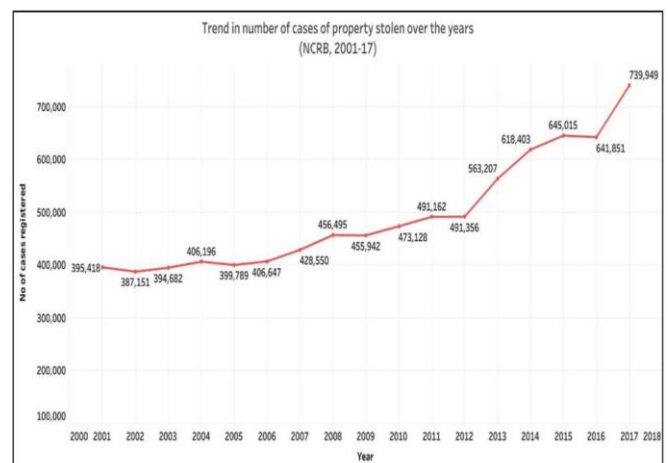
The stages in the proposed Traffic Police Management System are as shown within the Figure 1. Technical details of implementation of every stage are discussed in the next sections.

A. Authentication:

All the information given by User will get authenticate by the system by verifying User by his/her mobile number. System will send OTP on registered number and user have to give that OTP to system within short time span.

B. Encryption:

Encryption is defined as the conversion of something to code or symbols so that its contents cannot be understood if it is not understandable. System will encrypt all the information of Users Data and it get stored in database in encrypted format by using DES algorithm.

C. DES-algorithm:

Data Encryption Standard (DES) takes plain text in blocks of 64 bits and converts them to ciphertext using keys of 48 bits which is system process. It is a symmetric key algorithm, which means that the same key is used for encrypting and decrypting data. This is a proper algorithm for encryption of user's data.

D. QR code Development:

As we can see, QR code is mostly get used in todays life. We are going to generate unique QR code for each and individual user. All the information is getting stored in QR code in encrypted format. QR code is getting to get scanned only by Systems device for decryption.

E. Decryption:

Decryption is the process of transforming data that has been rendered unreadable through encryption back to its original form in which it getting stored at starting. All information which gets encrypted previously is get decrypted by scanning QR code by systems device.

F. Alert Message:

Alert messaging is machine-to-person communication that is important or time sensitive. This implementation is only available for traffic police or Admin. This mainly used for finding out the stolen vehicle. Alert Message playing important role in finding out the stolen vehicle.

5. ADVANTAGES

A. QR code technology:

In today's world, QR code playing important role in transaction and data sharing field. So, by using this technology we are going to make RTO system efficient. QR code connects online world to offline world. It is more user friendly. It promotes sharing and networking.

B. High Efficiency:

Since the entire process are going to be done by a computer and android application it means the entire registrations and data storing are going to be automated and done by the system itself, therefore, saving us the time which might are otherwise spent in the RTO office.

C. Increased Security:

The proposed system totally stored data in encrypted format. So basically, it increases the security of the system rather than the paper work of previous system. Data can be get decrypted by system device or admin side control.

D. Time Saving:

The whole world is affected by COVID19 and it's time we must give heed to social distancing. Having a secure distance with others has become a necessity nowadays. Times like this will be problematic if you've got manual RTO system, having an online RTO system won't only allow you to maintain secure distance from them as you'll work remotely. The whole system may be a much safer, time-saving, and faster method for existing RTO system.

E. User Friendly:

As a complete system is online based and also depend of QR code system it gets more user friendly. Any age group can easily able to handle this system rather than going in RTO office daily. Everything will be done according to plan. [4],[5]

6. DISADVANTAGES

A. If in the wrong hands, it will be a disaster.

B. Exchange of QR code can lead to be a problem.

7. APPLICATIONS

A. The system can be used in RTO Management, Police Database, etc.

B. It can also be used for simple document verification in any organization [1],[2].

8. CONCLUSIONS

By using our application, it is not necessary to carry all the documents and license every time. Simply you have to carry QR code in your Smartphone or sticker. By using our system, the particular driver goes through the verification process through a reliable and efficient manner for the verifier as well. QR code is currently widely used for implanting messages such that people can easily use their Smartphone's to capture the QR code and gain relevant data from QR code reader which exactly is required for proper verification and validation. User can get QR code by simply registering with the system [1],[2],[3].

This application is also beneficial to reduce the corruption that happens on daily basis due to document verification. As our application is user-friendly, it is efficient and reliable to use for both the parties i.e., the user as well as the police which reduces all hectic work of manual process. The main conclusion is to detect the stolen vehicle in a sophisticated manner [4],[5].

9. FUTURE SCOPE

The future work is to enhance the popularity rate of application so it can be used in the main RTO Office right while buying a new vehicle. The system developed recognizes the stolen vehicle only when its respective QR code is scanned which has got to be improved further. The recognition can often be fused if the QR code itself is replaced in the vehicles so this aspect needs some modification to realize better performance of the system.

The system can be measured to be used at police stations where the content is verified and maintained when the police are given the QR code information that can be used to grade the overall performance of the system [1-4].

REFERENCES

[1] Prof. Chandrakant Umarani , RashmiTeggi , Prachi Shetti , Lavanya Domanani , Yogita Havale. "Smart RTO Web and Android Application". International Journal of Engineering Science and Computing. Volume 7 Issue No.6, June 2017.

[2] Manjunath S Patil, Basavaraj K Madagouda ,Vinod C Desai. "E-RTO management system". International Journal of Engineering Research & Technology (IJERT) ISSN: 2278-0181 www.ijert.org IJERT IJERTV2IS70177 Vol. 2 Issue 7, July – 2013.

[3] Komal Chorghade, Piyush Dahiwele, Saurabh Deshmukh, Prof. Prajakta Pise." RTO Automation Using QR Code". International Research Journal of Engineering and Technology (IRJET) Volume: 05 Issue: 04 | Apr-2018.

[4] Jayalakshmi J, Ambily O A. "Vehicle Tracking Using RFID". International Journal of Engineering Research and General Science Volume 4, Issue 2, March-April, 2016

[5] WEI YUAN , PAN DENG , CHAO YANG , (Member, IEEE), JIAFU WAN , (Member, IEEE), DAQIANG ZHANG , (Senior Member, IEEE), XIANTONG CHEN , CHAOFAN BI , AND YALI LIU, ".Traffic Management System Using Android App". International Journal of Innovative Research in Science, Engineering and Technology. Vol. 7, Issue 2, February 2018

BIOGRAPHIES

SHUBHAM AHER
BE COMPUTER
AISSMSCOE, PUNE

ASAWARI AMPARWAR
BE COMPUTER
AISSMSCOE, PUNE

ANUSHKA SURYAVANSHI
BE COMPUTER
AISSMSCOE, PUNE

TANUJ AHIRRAO
BE COMPUTER
AISSMSCOE, PUNE

B R QUAZI
ASSISTANT PROFESSOR
AISSMSCOE, PUNE