International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 07 Issue: 07 | July 2020 www.irjet.net p-ISSN: 2395-0072

UNIQUE QR CODE FOR VEHICLE VERIFICATION

Sumeena S[1], Muhammed Hassan A K [2], Varsha Vasav[3], Amrutha Vishnupriya S[4]

[1,2,3]Students, Dept. of CSE, Musaliar College of Engineering & Technology, Pathanamthitta, Kerala, India
[4]Assistant Professor, Dept. of CSE, Musaliar College of Engineering & Technology, Kerala, India

---

Abstract - *All over the world, as per the Motor Vehicles Act of the respective countries, it is mandatory that when driving a vehicle, he/she must carry the driving license and vehicle related documents (original/Xerox (of)) like (Registration certificates book, vehicle pollution under control (PUC) certificate, vehicle insurance policy, tax papers etc).Often we do not have the documentations to carry our documents in different situations. As a solution for this, we are proposing a digital platform where he/she can access their documents anywhere, anytime digitally. The digital service can avail by scanning a unique quick response code (QR code) in the vehicle. QR-Code is a machine-scannable image can be instantly read using a smartphone camera. Platform allow user to get notification when the documents needed to be renewed and other services like online requesting for renewal of documents etc. The total service will help in saving significant amount of time and resources. The objectives are to digitize all documents, ensure authenticity of documents, eliminate the use of fake documents, to find stolen vehicles, reduce the work load and time.*

Key Words: **QR code, User's and Traffic Inspector's Android Application, RTO Cloud Server**

1. INTRODUCTION

In day to day life there is lots of increment in population. Now a day most of the people are using their own vehicles. Due to this traffic work has been increased. So this work deals with the creation of a real-life android application, where all the necessary details of a vehicle (i.e., Registration Certificate, Insurance Policy and vehicle's Pollution Under Control Certificate) are coordinated and stored by the database of RTO admin without much effort and it can accessed by both the user and vehicle inspector. We can digitalize all documents which are taken care of without so much efforts and hard work. In existing process is done manually it takes lots of time and also many citizens has there fake documents.

"Unique QR Code For Vehicle Verification" is for traffic police using QR code to avoid to carry the physical documents it also avoid some security Issues and also reduce following:

- All documents related to vehicle and owner can now be access through smart phone.
- This contains one application which can be accessed by both user and traffic police verifier.
- The traffic police will simply scan the QR code on vehicle and then all documents will display on the application login by unique ID(registration number of vehicle) and password.

Improving Transparency in system and lots of time should be saved. It can save the amount of time of user and authority. It deals with the creation of an android application where all details of the vehicle. The admin (RTO Admin) can handle or control the addition, updating and removing of documents on a cloud server and also they give the Unique ID (mobile number) and password to the particular user and also notification alert feature if citizen's documents expired.

Security and privacy are great importance to a cloud server and message authentication. Without security, it is difficult to store and securely send the data from the cloud server to an authorized person. Here AES algorithm is used to provide strong security to cloud server and mobile authentication.

Now a day's population has become a major factor to be considered as a result the number of vehicle's are growing by increasing problems of vehicle and license registration, insurance and tax validity for RTO administration and documents verification by traffic inspector. RTO employees having lot of work burden of making registration, license issue, transfer etc, which requires lot of paper work. As a result people can't get the things done in right time, which is the waste of time and energy. Similarly the vehicle owner sometimes forgets to carry the license and other vehicle related documents at the time of inspection.

This paper proposed an approach to solve such problems that is by storing all the information related to vehicle and driver at database by RTO administrator and an android application is provided by both the vehicle inspector and user to retrieve vehicle related information and also we can add a provision to track a stolen vehicle.

This project targets to store the information related to vehicle such as insurance, license, PUC details, insurance details, personal details of the applier and registration date. This application would be installed in Android phones of traffic police and user. And it will provide input fields to traffic police to enter the vehicle number as well as to scan the QR code in order to retrieve the information related to vehicle and license from database. This application also generates fine if the user violate traffic rules and location at

where it is undertaken for inspection. Hence it is completely service oriented application.

Advantages of this application are considerably reduces the corruption in transport department that means some officers try to bribe more while charging fines. Keep the license documents safely in database with highly encrypted security algorithms. To offer the drivers to be independent of vehicle related papers.

In the following figure, one of the newest developments is the use of Quick Response codes (QR codes) to quickly data scanning and readable technique. This Japanese technique is improving part of barcode it has a combination of standard kind of data such as numeric, bytes/binary, alphanumeric etc.

Fig-1: QR code

2. OBJECTIVES

It deals with the creation of a real-life android application, where all the necessary details of a vehicle are coordinated and stored by the user without much effort. Quick Response Code (QR-Code), a highly effective and fast readable technology is used for getting various details of a vehicle and user.

It is a known fact and has been established by various studies that, most of the urban people spend at an average 2.5 hours a day commuting by vehicle. On larger metropolitan cities the commuting time is almost twice than the original time required to reach the destination because of unavoidable traffic congestions, disproportionate number of vehicles a road can accommodate and due to rush in peak hours. When the traffic police stops them on the road to verify the credentials of their vehicle the commuter loses more of his precious time.

All of the documents are checked by the inspecting authority of the traffic police department. Since the whole process is done manually, it consumes a lot of time and there is possibility for malfeasance due to a lack of transparency in the existing system. It can also save considerable amount of time, since the software implemented in a device takes little time in completing a task, compared to the corresponding manual functioning. The precious amount of time can be saved for both user and the authority. It will result in faster implementation of a time consuming exercise and also brings in greater transparency in levying fines.

A user friendly and convenient android application which provides authorization for the vehicle identification and registration. It also provides mutual authentication and confidentiality between the traffic police and users in order to avoid leakage and corruption of documents. The QR code usage in this application resolves the difficulty in the manual registration process of the vehicle and user documents. This generated QR code is placed in the number plates of the vehicles. The QR code can be scanned using the cameras of advanced smart mobile phones. The police officers can check the vehicle details and charge cases on accidents, fines, theft and traffic rules violations using QR code. In addition, vehicle insurance payments and renewals alert are sent to the vehicle owner for notifying them for modifications. The non permitted vehicles can be blocked in the next check post by sending the alert messages.

This Vehicle Verification System objective is to increase the efficiency in verification of any vehicle and owner details. In the given system all the information of vehicles will be maintained by the mobile application system which can be maintained by the vehicle inspector and the user can only see the details about their vehicle and raise any complaints and requested for any modifications. The Vehicle Verification System will allow a person to find the information of any vehicle such as model number, efficiency, cost, fuel type etc. This will be used by various attributes such as police, insurance company, service provider, pollution control board, a user who want to buy a new or second-hand vehicle. It will reduce the human burden regarding their vehicle's safety. Unique QR code for vehicle verification System is the versatile software solution. The software is designed in a planned way and using various technologies including various new facilities like using DBMS software for storage of data. The software is programmed in such a way that it is having a centralized storage of the database. Using Vehicle Verification System software, all the details regarding the particular vehicle and user can be find out within a moment. Can be used by police departments also for stolen vehicle catching. It makes the data storage in very easy and versatile.

E-copies of your driving license, vehicle registration certificates etc kept in a mobile app and treated as valid documents. If you break a traffic rule, there is no need of physical documents for charging fines.

The objectives are:-

- To digitize all documents and record of the residents and make them available on real time basis.
- Minimize the use of physical documents and it is so hard to carry the original documents at all time.
- It reduces the administration overhead of Government departments by minimizing the use of papers.
- Ensure genuineness of documents and eliminate the use of fake documents.

- Enhance the authenticity of the QR code
- Notify the people to renew the expired documents on correct time.
- Only the owner and vehicle inspector have the right to see the documents.
- One of the most user-friendly applications, dealing with a humongous database.
- It helps the traffic police officers to find quickly stolen vehicles.
- Police officers cannot charge the existing fines and bribe more.

3. GENERAL BACKGROUND

3.1 Background to the study

Many accidents are happened due to infringement of traffic rules, driving the vehicle without proper license, registration certificates book, vehicle pollution under control (PUC) certificate, vehicle Insurance policy. The authorities unsupportive of verifying the identity of every driver on a road such as the driver is a thief or a criminal and whether the driver should have license or not. Today, computer system has been discovered as a very smart and efficient instrument, which has played a very significant role in adequate management of information and security. Besides, it has played more roles throughout our country. However, computerization has helped in many areas of life and especially in vehicle owners, the thought of computerization has a great important role in order to wipe out the manual data processing system from which many problems have originated like corruption and misusage.

Due to traffic congestion and increasing number of vehicles on road, it is difficult to identify every vehicle uniquely at high speed. To monitor the vehicle manually is very difficult task on road. The aim of this research is to easy identification and verification of the vehicle. In today's time there are so many people breaking traffic rules without any fear, one of them is jumping red light signals and someone will stop their vehicle over the zebra line. Sometimes due to this the vehicle meets an accident with another vehicle, which may cause severe injuries to driver and even death. In the past few years, traffic accidents & congestions have increased enormously throughout the world. Also, the current traffic rule regulations are not very strong and the implementation methods are severely flawed. Due to these, bribery has become rampant among police officers. This in turn leads to increased traffic congestion and road accidents.

Currently, there have different technologies to detect traffic congestion and to make congestion management more efficient and effective, but these technologies have several drawbacks and limitations, such as installation problems, complexity, cost, etc. On a regular basis, officers observe people have to stop their vehicles on the road or toll booth to show their vehicle and user documents for verification and then continue their journey. This is not only waste of valuable time for the driver and the police who take time in checking the documents and return them back. Sometimes the driver fails to carry all the documents due to some reason and therefore has to put up with a fine. Many existing system like Automatic Number Plate Recognition System is used only for traffic violations. Smart card is another system that includes information like details of vehicles and registration numbers, but does not include the insurance papers. Here, we are trying to incur penalty for almost all the traffic rule violations. Hence, a verification of vehicle uniquely is an important issue to be considered. The traffic authorities need to find new methods to overcoming this difficulty. Through this paper we are aiming to provide a system, which will use for verify vehicle using QR Code and decreases the time required for the existing system. If a driver violates any of the traffic rues, the driver will be charged according to the RTO rules.

3.2 Statement of Problem

The main problem involves people stopping their vehicles on the road or toll booth to show their documents for their vehicles and then continue their journey. This is not only waste of valuable time for the driver and the police who take time in checking the documents and return them back. Sometimes the driver fails to carry the documents due to some reason and therefore has to put up with a fine. The current traffic rule and regulations are not very strongest and the implementation methods are severely flawed. Due to these, bribery has become rampant. Lack of proper management of both personnel drivers and assets (the vehicles and the goods they carry) is another problem facing the system.

3.3 Aim and Objectives of study

The aim of this proposed project is to design a mobile app for vehicle verification system that will generate a QR-code to verify and identity every vehicle in order to eliminate the problems facing the manual system.

The listed objectives below will help in achieving the aim:

i. Investigate and examine the existing manual method of verifying and identifying vehicles.
ii. To provide an easy and simplest form of vehicle verification since the information and details of the vehicle are stored in this mobile app.
iii. Analyze the designed vehicle verification system with the QR code and test its efficiency and effectiveness.
iv. Save the significant amount of time.

3.4 Significance of study

Many existing systems like Automatic Number Plate Recognition System is used for identifying traffic violations. Smart card is another system that includes information like details of vehicles and registration numbers, but does not include the insurance papers.

This project work is significant as it aims to provide a system, which will use for verify vehicle using QR Code and decreases the time required for the existing system and also provide notifications related to the vehicle will send to the individuals mobile phone. It protects the vehicle and people that are been transported on road and create an easy recognition of every road user using QR-code. It will eliminate the adamant thoughts of traffic offenders because they can easily be tracked. When ignored, we will have to embrace the existing manual vehicle verification system which is user intensive, and time consuming for both user and police inspector when there have traffic congestion and increasing number of user on road and it is difficult to identify every vehicle uniquely.

3.5 Definitions of terms

i. Quick Response Code (QR): The QR code was invented in 1994 by Denso Wave, is a trademark for a matrix barcode (or two-dimensional barcode) was first designed for the automotive industry in Japan. QR code uses four standardized encoding modes to efficiently hold data. It has black squares arranged in a square grid on a white background, which can be read by camera and processed using Reed-Solomon error correction until the image can be appropriately compiled.

ii. Verification and Validation System: These are independent procedures that are used together for checking that a product, service, or system meets requirements and specifications and that it fulfills its intended purpose. Validation is the assurance that a product, service, or system meets the customer and other identified stakeholder. Verification is the evaluation of whether or not a product or system complies with a regulation, requirement, specification, or imposed condition.

iii. Information System: Information system refers to a set of systems (hardware, software, database, procedures and human resources) that supports data intensive applications and captures data related to an organizations operation for example, an airline ticketing systems.

4. LITERATURE SURVEY

[1]. Ms. Ankita V.Ghodke, Prof. Rahul V.Dagade "Electronic Secure Vehicle Verification system using Advanced Digi-Locker system"(I2CT) 06-08, 2018.

The Digital Locker is storage facility avoid to carry the physical documents it digitalize the documents. This Application Contains two sub Application:- User application and vehicle verification application. Improving Transparency in system and lots of time should be saved. The proposed system can save the amount of time of user and police officer. This RTO digi-locker mechanism aims to eliminate the physical documents work. This work deals with the creation of an android application where all details of the vehicle are stored.

One of the newest developments is the use of Quick Response codes (QR codes) to quickly data scanning and readable technique by using a smart camera. This Japanese technique is improving part of barcode it has a combination of standard kind of data such as numeric, bytes/binary, alphanumeric etc. This application is used for solving the real-time problem which takes safe custody of the important documents such as driving license, PUC, insurance, RC book etc. which verify the vehicle and user electronically, so result is provide much more transparency, authenticity, and reduce corruption of fake documents by users and also reduces the administration overhead of RTO Admin by minimizing the use of paper documents.

[2]. Mr. Nilesh R. Patil, Prof. Rajesh Dharmik, "Secured Cloud Architecture for Cloud Service Provider", WCFTR, 2016s

Today's world is of cloud computing, cloud service provider provides different resources and services to the user anytime anywhere over the internet. Due to this feature of cloud, it maintains security over data is complex. Cloud computing security issues are authentication of user, non repudiation, authority, confidentiality, privacy, availability, access control and checking the integrity of data

Cloud computing has been envisioned as the next-generation Information Technology (IT) architecture for enterprises and various private and public sector. Due to its huge advantages in the IT history: on-demand self-service, ubiquitous network access, location independent resource pooling, rapid resource elasticity, usage-based pricing and transference of risk. User can access the cloud resources and services from anywhere anytime by using the internet. Cloud computing also allows users and organizations to use application without the necessity to install in their computer. The secured architecture for cloud service provider for mapping the different security issues related to authentication and data stored on cloud. Here we have

proposed OTP for authentication of user, hashing for checking the integrity of data and for maintaining confidentiality of data we used encryption. Our cloud architecture is more efficient because it uses efficient hashing algorithm which maps the pre-image attack and collision attack.

The cloud computing uses different services and resource's like SAAS, PAAS, IAAS etc. So there are lots of issues in cloud security that are privacy access control, authentication of the user, confidentiality, and integrity of data. These researchers were surveying on which architecture is most suitable and secure for our proposed system which is going to map some cloud security issues that are confidentiality, privacy access control, authentication of the user, the integrity of data.

[3]. N Karale, Kalyani Pendke, Prashant Dahiwale, "The Survey of Various Techniques & Algorithms for SMS Security Shraddha", IEEE (ICIIECS'15), 2014.

Message authentication is an important security tool. But, without some security enhancement mechanism or algorithms, it is difficult to send data in secure manner to recipient. Most popular shortest and easiest textual form of communication is short message service (SMS). Cryptography is the one of the computer security that converts information from its normal form into an unreadable format by using Encryption and Decryption algorithms. To ensure the security of the texts, many encryption algorithms are available.

This paper was focus on message security, authenticity and to secure the text data while transmitting in the network. The data which is to be transmitted from sender to receiver in the network must be encrypted using the encrypted algorithm like DES. Symmetric key algorithms reduce the problem of computational overhead of keys and to the calculation of algorithm and improves the performance of encryption. This paper was able to provide more efficient authentication mechanisms for textual data

Security and privacy is a great importance to a cloud server and message authentication. Without security, it is difficult to store and securely send the data from the cloud server to an authorized person. In cryptography technique use symmetric and asymmetric key algorithm which reduce the problem of cloud security.

The main goal of security mechanism is to provide message privacy that guarantees provision of confidentiality, integrity and non repetition of data. The main feature of network security is to provide efficient authentication for data by using cryptographic techniques. There are some important terms are used to secure private information.

They survey on various security algorithms like DES, 3DES, RC4 and AES in detail. It finally discuss about the Modified AES algorithm. DES and Triple DES not provide extra security and making use of double and triple encryption and very slow when implemented on software. DES has large amount of data size and short key length limits its uses. RC4 suffers from weak keys problems. After analyzing all the above algorithms the most popular symmetric algorithm is AES which is most flexible, and have best encryption performance, secure, faster and better.

[4]. Mr. Niteen Surv, Mrs. Jayshree Katti, "Framework for Client Side AES Encryption Technique in Cloud Computing", IEEE(IACC), 2015, pp .525-528.

Cloud computing is defined as the use of various computing services from the Internet. To individual users and businesses to use software and hardware that are managed by third parties at remote locations and also and this is done by cloud computing. The cloud computing uses cloud (Internet) that will provide the way to deliver the services whenever and wherever the user of the cloud will need.

Cloud computing system is divided into 2 sections: The first section is known as front-end and another section is the back-end. They are connected to each other by using network which is called as the Internet. The front-end contains the computer of client (or computer network) and the system application is required to retrieve the cloud computing data. At the back-end of the system there are the several computer systems, several server nodes and data storage systems that developed the cloud of the computing service. The central server's task is to administrating the system, monitoring trace and client demands to ensure that everything runs very correctly or not. They follow a different set of rules called as a protocol and use a special type of software which is called as middleware. The Middleware allows the network computers to collaborate with one user to another.

The AES (Advanced Encryption Standard) is the new best encryption algorithm to replace DES. It is a symmetric-key block cipher algorithm. The AES algorithm has 3 keys for fixed 128-bit block ciphers text i.e. 128 bits, 192 bits and 256 bits. The size of key is unlimited, where the key size is maximum of 256 bits. AES encryption technique is fastest, flexible and highly secured and can be supported by various platforms.

Cloud computing has so many issues in the network world. In previous paper [3], show the different algorithms which provide security, but in comparison AES algorithm which gives the more powerful and more secure for storing the data on a cloud server. In cryptography, AES is the latest algorithm which the fastest speed to encrypt the number of

documents and it is advanced algorithm DES which has lots of capacity to secretly storing the data. AES algorithm is symmetric block cipher algorithm and also it use for storing and retrieving the data using secret key for providing security to various platform.

[5]. Lokesh S. Khedekar Prajakta S. Kale, "Strength of QR code over design and implementation of verification system", IEEE(ICCSP), 2016, pp .2190-2193.

It is related with new proposed algorithm for authentication system for any organization. Authentication is process in which the credential provided are compared to those on a file in a database of authorized user. Information on local operating system or within authentication server, if the credential match the process is completed and the user is generated authorization for access.

One of the newest developments is the use of Quick Response codes (QR codes) to quickly data scanning and readable technique. Survey on this paper shows the strength of QR code which eliminates the weakness of password. The main strength of QR code has lots of capacity to hold large amount of data in secured format.

Large amount of data store in the inventory means QR code image have mare capacity to hold data. It may possible to carry the QR code image in any portable device. QR code image is corrupt or hammer may possible by using error correction algorithm to correct it.

Currently many authentication systems are available but which have strength and weakness. There is growing interest in using QR Code. A new method is proposed here which is more relevant and provides strengths of data in the authentication system.

[6]. David Lorenzia, Jaideep Vaidya, Soon Chun, Basit Shafiq, Vijayalakshmi Atluri a, "Enhancing the government service experience through QR codes on mobile platforms", Elsevier(Journal), 2014, pp .6-16.

Cell phones and smart phones continue to advance at a rapid rate increasing in computational power and number of sensors available to the user (GPS radio, camera, gyroscope, compass, etc.). Most cell phone capabilities do not necessarily depend on the use of a network connection of some kind (cellular, 3G etc.), for example, the camera, gyroscope, and compass are placed within the smart phone and do not require external networks to perform their functions and activities. GPS is the notable exception, which must receive a signal from the GPS satellite network in order to function properly. Given these mobile sensors increase computing power of a smart phone, and increased power capacity, there has been an explosion of mobile apps (application software and services that can be installed on the mobile devices) that benefit and entertain the public.
One of the newest developments is the use of QR Code to quickly facilitate the storage for relatively large amounts of data in a compact fashion. A Quick Response code (QR code) is a type of matrix barcode (or two-dimensional code) that is much faster than traditional barcodes. It is also known as a mobile barcode since it can be scanned and read by a QR-Code reader, software that is installed on a mobile phone. Survey on QR code can be used on smart mobile phone because it has more capacity to hold data and also it may possible to carry the QR-code image in portable devices using DES algorithm.

Digital government is universally gaining acceptance from the public becomes more technologically advanced. It is critical for the government to develop new technology for minimizing expenditure and maximizing utility of services to the taxpayers and users. While administrative services have been easily shifted to the digital world, there are still many important citizen-based services that have not yet been effectively migrated. They integrate QR code systems and corresponding smart phone applications into existing government services with the goal of providing a new level of interactivity for the public QR codes are used in marketing promotions such as discount coupons, advertisements and supply chain management areas far beyond their original imagined use cases which were tracking automobile parts in the auto manufacturing industry. QR code provides a cheap, easy, and secure method to transmit information to individuals who have the ability to read the code.

[7]. Wengang Hou, "A Fast Image Encryption Scheme Based on AES", Yong Zhang, Xueqian Li"s, IEEE(2nd ICIVC), 2017, pp .624-628.

A fast image cryptographic system based on AES is verified in this paper. The plain image is divided into blocks of plain text of size 128 bits. The first plane text is permutated by an initial vector(IV). Then, AES in cipher block chaining(CBC) mode is used to encrypt each plain text in sequentially. The initial vector and cipher text are transmitted to the decryption party through the public information channel. The decryption party uses the secret key and initial vector to decrypt the cipher image to obtain the original image. Simulation results show that this image cryptosystem is both secure and high speed

The key of AES is also the key of image cryptosystem. AES is secure by far, so the tested image cryptosystem is secure. And simulation results show that the image cryptosystem based on AES are faster than some image cryptosystems based on chaotic systems. Thus, the tested system can be used as the comparison basement of newly proposed image cryptosystems. Those image cryptosystems whose encryption/decryption speed is slower

than the AES based scheme in the same computer need to be improved.

5. PROPOSED SYSTEM

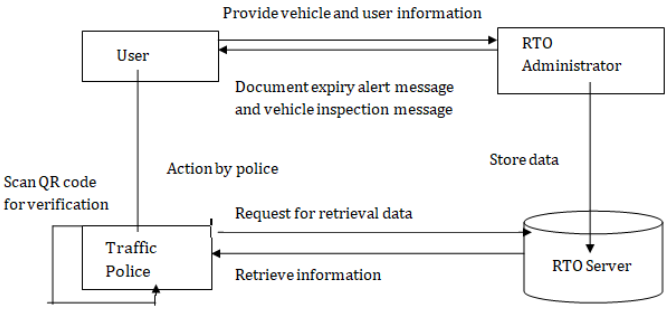

Fig -2: Proposed system

The above fig 2 shows newly programmed software doesn't require any manual work or going to the concerning office, instead it will reduce the work level for getting the data related to any particular vehicle. Even the vehicle's owner does not need to fill any form for getting the data. This software based vehicle identification system reduces the load and makes the way easy for storing all the relevant details regarding vehicles at a particular server and access it in one click whenever needed.

Proposed system mainly consists of two modules:-

• User:- Provide vehicle and personal information to RTO administrator (name, address, license no., mobile no., vehicle number, insurance certificate etc.) and get QR code.
• Traffic police:- Scan the QR code and retrieve vehicle and user information. He can charge fines from the user if he violates any traffic rules.

6. METHODOLOGY

"Unique QR code for vehicle verification" consisting of an android application, where all the necessary details of a vehicle are coordinated and stored by the vehicle inspector. By using QR-Code, getting various details of a vehicle and user, and enter them into this application. QR-Code is a two-dimensional bar code which developed from the basics of one-dimensional or uni directional bar code. QR code has features like small printout size, high capacity, dirt and damage resistant, readable from any direction in 360 degree. The user needs to do is to scan the QR-code properly into the application and the necessary details of a vehicle that are needed are automatically fetched by the application, thereby saving considerable amount of time and resources.

The vehicle inspector needs to do is to scan a unique QR-Code into the mobile application. The application allows the faster recognition of the availability, or the lack of availability, of the important documents pertaining to that particular vehicle and user. It helps in saving significant amount of time and resources from wastage which are at present spent on this task. In view of the security risks, exposing personal details of users and vehicles, greater protection has also been given for securing the data by using QR-codes. This system is completely digital and paperless, uses QR code, faster and efficient, simplified and centralized approach. It automatically fetches necessary details from database when it needed for further activities. Manual verification of authenticating the credentials of a vehicle is a tedious process. The application is faster and efficient because it uses QR-code for holding large amount of datum.

In this system, a unique QR code will be pasted on each vehicle. This QR code can be scan by both user and vehicle inspector by using an android application. After scanning, all the details related to vehicle and owner are displayed on the screen which includes registration certificate details, fines, vehicle insurance policy, pollution under control certificate, personal details etc. All details are uploaded to the server by issuer, which can be easily access at any time at anywhere without any distraction. This will reduce the use of fake documents.

This application will help to know the details of fine and amount to be paid. At the time of inspection, if any fines are charged, the vehicle inspector must be need to update in the application and also the previous fines charged can be known by entering the vehicle number. Vehicle inspector cannot charge the existing fines and bribe more due to digitalization. Owner will get notified with location when the vehicles undertaken for an inspection, which will help the police officers to find stolen vehicles quickly.

7. DESIGN OF SYSTEM

7.1 Data Flow Diagram

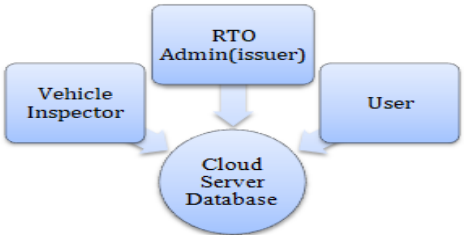

Fig -3: Architecture of system

The above fig 3 shows the architecture of unique QR code of vehicle verification system consist of following components:

Vehicle inspector: Scan the QR code and retrieve vehicle and user information.

RTO admin: Admin stores all the information related to vehicle and user.

User: Provide vehicle and personal information to RTO administrator

7.1.1 User

The user first needs to download the vehicle verification android application on his/her smart phone. After downloading the application, user will be entering Unique ID (Mobile number) and Password (Registration number of

vehicle) on the application login page. User can only view the documents that are in the database and also he/she can add any complaints and requests in the application. Fig 4 show the internal layout, when user button is click.

When a person buys a new vehicle it is mandatory to get the vehicle registered with the RTO of the respective region. In the normal case, RTO authorities would seek for the basic information of the user against whose name the vehicle is to be registered. It will also contain all the details of the vehicle such as type of vehicle, color of the vehicle, its engine number, chase number etc. Then a registration number for the vehicle will be provided after the registration fee is paid.

The next thing the user needs to do is to complete the formalities for obtaining the insurance policy document and vehicle's PUC certificate. For this, the user would approach the insurance department and the PUC department respectively and furnishing his/her unique ID and password, RC-Book and other basic information. From the insurance department the user would receive the hard-copy of the Insurance Policy document after remitting the premium amount. The admin after verifying the credentials will update the application, with the details regarding the insurance policy which can be accessed by both user and vehicle inspector from his/her application.

Similarly, if the vehicle's pollution is under permissible limit, the PUC department would provide the user with a PUC certificate for the vehicle after he/she remits the total payable amount. Once the credentials of the PUC certificate are verified by the admin, those details would be updated onto the android application having that particular vehicle registered. Then both user and vehicle inspector can access that information from his mobile application itself. Now the user has confirmed with all the mandatory requirements of the vehicle to be legally running on the road. If the user owns multiple vehicles, he/she can perform the same processes mentioned in above, to obtain the relevant documents and get it updated onto his/her android application.

When click on user button we can login by using user id and password. Then we can see different buttons related to the vehicle information. When click on scan QR code button, then scan the QR code using a smart phone camera and shows the information related to the vehicle. The user can choose any of the buttons. The user can only see the details and raise any complaints and requested to any modification about the details.

7.1.2 Vehicle Inspector

The respective vehicle inspector has all authority to verify the various vehicle documents. In existing system when traffic police want to verify the documents of citizens there is some user carries the fake documents. But in this system, remove this drawback and gives more transparency about user vehicle documents and increase securely access the documents, save the amount of time of user and traffic police.

The inspecting authority is selected by the police department since it is obvious that in the existing system it is the police who inspect the vehicles. Each of the designated inspecting authorities will be provided with this android application which he/she will use for the purpose of authenticating the credentials of the vehicle in a fast and secure manner. The authority's application will only be provided to those designated, chosen officers.

When verifier authority wants to verify the documents of citizens he/ she first enter on the application and scan QR code of user on his/ her mobile phone, then RTO cloud server access QR code image from traffic police verifier mobile phone and provide the vehicle documents such as insurance policy papers, PUC papers, RC book details, license, personal details etc in details of particular citizens. Below Fig 6 shows the internal layout, when click on vehicle inspector button. We can see different buttons and the vehicle inspector can change or modify the details of the individuals. The main advantage of this module is that it helps to generate the fine and amount to be paid.

7.1.3 RTO Admin

One of the main parts in the proposed system is RTO Admin whose scan all documents of the user and stored on RTO cloud server in encrypted form and gives the one specific password to vehicle inspectors.

The role of the admin does not end once the application is created and distributed to the users; rather the maintenance of the database in itself is a greater responsibility than creating it. The administrator will be chosen by the Government or the police department and will be entrusted with the duty of verifying, updating and maintaining the android application. The administrator must also coordinate various documents pertaining to all the vehicles received from all departments.

The role of the admin starts when a user downloads application and registered, unique ID is provided by the admin to all the users who get registered with the application. After that when a new vehicle gets registered with that unique ID the admin stores those details into the centralized database, also those relevant details regarding the vehicle are displayed by the admin on the user's application. Only the admin has the right to add new users into the application, remove any user upon receiving a request for the same, and also for blocking/unblocking a user or any particular vehicle of a user.

The admin plays a more important role in maintaining the humongous database of the various departments, the user application as well as the authority application. The maintenance is always performed in concurrence with satisfying the requests for modification, removal and addition of new details as per the user's and the police department's requests. Usually, the notification will start getting displayed 15 days prior to the time of expiry of the particular document of a vehicle like insurance, tax, PUC certificate etc.

7.2 Algorithm

Flow of process:-

Input: To store the user and vehicle related documents on RTO cloud server using AES algorithm.

Step1: The algorithm will have two parts user, and traffic police inspector.

Step 2: RTO Admin Officer // RTO cloud server

Input: All Document scan And store on the server using Parallel AES algorithms

Output: Give's one unique ID and password to user and also another unique ID and password for police officer.

a. Register.

b. Upload / modify/ delete all documents in encrypted format.

Step 3: User's / Citizen's application

Input: register, Login.

Output: Display the documents to user

a. User Request.

b. Register.

c. Login.

d. View documents.

e. Notification to user if documents expired or fine is charged and location.

Step 4: Documents verifier /Traffic police verifier.

Input: Login, Scan the QR code of User

Output: View and modify documents.

a. Verify the details at the time of inspection.

b. Upload fine details when traffic rules are violated.

c. Enter RC details if the user is not yet registered.

Step 5: The location at where the vehicle is undertaken for inspection will automatically store in the database and it will notify the user and police officer with the previous location also, so this will help for finding stolen vehicles easily by officers

Step 6: Final output give fast and quick documents viewing using QR code with parallel AES algorithm.

7.3 Flowchart

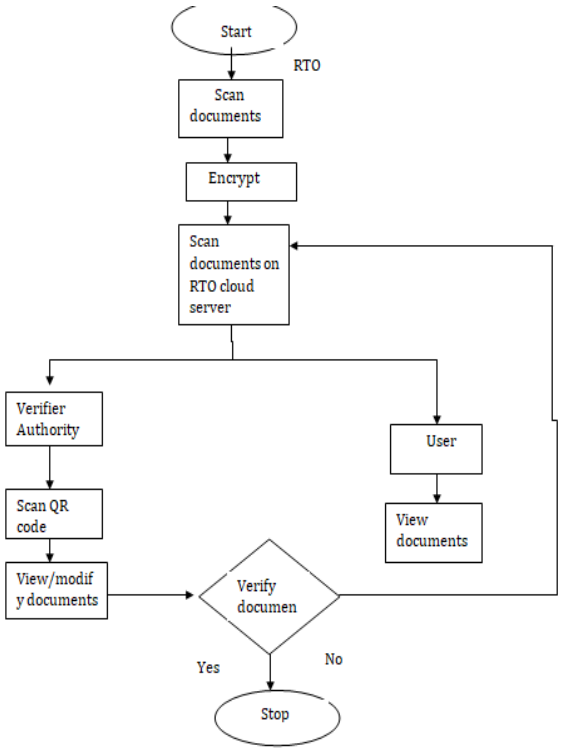

Fig -4: Flowchart of system

In fig 4 show the flowchart of unique QR code for vehicle verification system. A flowchart is defined as a diagrammatic representation of an algorithm, a step-by-step approach to solving a specified task.

Flowcharts are used for analyzing, designing, documenting or managing a process or programming various fields.

The circle represents the connector, the square represents the process, the diamond shape represents the decision and the arrow mark represents the flow of process.

7.4 UML Sequence Diagram

Fig 5 shows the UML sequence diagram of unique QR code for vehicle verification system. UML is a unified modeling language in the field of software engineering which aims to set standard ways to visualize the design of a system to make easier to person who is not have basic knowledge of programs. UML guides the developer to create multiple types of diagrams such as interaction, structural and behavioral diagrams(class diagrams, object diagrams etc) where the vehicle inspector and user will be able to login their account using user id and password.

After login user can see the vehicle related information such as registration certificate book, vehicle pollution under control (PUC) certificate, vehicle Insurance policy, nearest RTO etc. And only the user can see the details of the vehicle and doesn't change any modification. The user rise any complaints related to the information. Also the will happened when vehicle inspector login. The vehicle inspector can change the details of the vehicle. The above diagram helps to

demonstrate how the login page works. The user or vehicle inspector will not be able to access this page without verifying their identity.

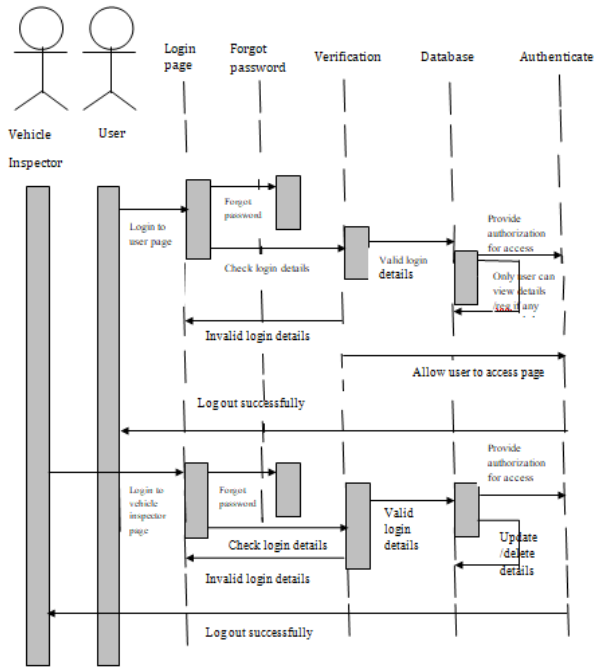

Fig -5: UML Sequence diagram of system

Benefits are the following:

- Registered individuals can access their digital documents anytime, anywhere and can raise complaints and requests if they needed to upload.
- The service is free, safe, secure and user-friendly.
- Best initiative to make paper-free government, saving environment.
- Documents issues by governance departments can be directly pushed by the department into mobile app, hence reducing administrative overheads.
- Self-uploaded documents can be authenticated.
- To sign up for this app, all you need is a laptop/pc or a smart phone with an internet connection.
- The Cost of Providing the Service: Digi docs will gradually bring down the cost of providing the service by the government. It will reduce the government's staffing requirement & other operational costs thus will bring the government expenditure in control.
- User can access documents at anytime anywhere. No need to carry physical documents.

8. EXPECTED OUTCOME

The unique QR code for vehicle verification system solves these issues:

- To digitize all vehicles related documents.
- Minimize the use of physical documents.
- It reduces the administration overhead of government departments by minimizing the use of papers.
- Ensure authenticity of documents and there eliminate the use of fake documents.
- Notify the people to renew the expired documents on correct time.
- It helps the traffic police officers to find quickly stolen vehicles.
- Police officers cannot charge bribes and more than the existing fines.

9. FUTURE SCOPE

Road accidents in India take more lives than natural disasters and diseases and these figures are on the rise, with the aim of addressing this problem, we are suggesting some methods like electronic monitoring etc. Electronic monitoring has a provision that the government to ensure proper electronic surveillance on natural and state highways and urban roads.

The tracking technology of most people we familiar with the global positioning system, or GPS, satellite technology owned by the U.S government and operated by the air force but now a commercial part of our everyday lives. GPS is used for the purposes ranging from locating lost pets to planning road trips. We can use a live vehicle tracking which helps to find the stolen vehicle and also with the help of this live location tracking we control the traffic and avoiding of traffic blocks are possible by tracking the live location of vehicles and if we use the GPS in every vehicle, then it is easy to navigate, because every navigation system maintains a log of last few places the driver routed. This is a handy feature if you want to return to the same place but can't remember how you got these. So if we set a GPS tracking in every vehicle, we can make the whole motor vehicle department a smart. Also GPS technology ensures drivers safety by checking driving behavior. A constant tracking keeps theses away from over speeding and brash driving, so with the help of GPS technology, you can identify drivers who exhibits good driving skills and can offer rewards or incentives accordingly.

The application can be enhanced with the concept of number plate recognition through image/camera. This paper can enhance the application by linking it to the Aadhar Card database in order to retrieve more details of the license/vehicle owner.

10. CONCLUSIONS

Unique QR code for vehicle verification system is used for solving the real-time problem which takes safe custody of the important documents such as Driving License, PUC, Insurance, RC Book etc. which verify the vehicle documents digitally, so result in much more transparency, authenticity, and also reduce corruption of fake documents and also reduces the administration overhead of RTO Admin

by minimizing the use of papers. This application will notify the owner with location when his/her vehicle is undertaken for an inspection which helps the vehicle inspectors to find the stolen vehicles quickly. Vehicle inspectors cannot charge existing fines and bribes more because this application includes all the types of fines and amount to be paid. Owner will get notified at the correct time when the papers are expired, also at the time of app updation and if any fines are charged.

Considering the positive aspects of the QR Code, the proposed method is brought into actual practice will definitely prove to be a boon. The proposed project analyses the vehicle document tracking based on QR code. By using our system the driver will goes through the verification process through a reliable and efficient manner by a traffic inspector. QR code is being widely used for implanting messages such that people can easily use their Smartphone's to capture the QR code and gain relevant data from OR code reader. User can get QR code from the RTO administration.

REFERENCES

[1] Ms. Ankita V.Ghodke and Prof. Rahul V.Dagade "Electronic Secure Vehicle Verification system using Advanced Digi-Locker system", IEEE,2018

[2] Mr. Nilesh R. Patil and Prof. Rajesh Dharmik ," Secured Cloud Architecture for Cloud Service Provider" IEEE (WCFTR'16) , 2016

[3] N Karale, Kalyani Pendke and Prashant Dahiwale ," The Survey of Various Techniques & Algorithms for SMS Security Shraddha " ,IEEE (ICIIECS'15), 2014.

[4] Mr. Niteen Surv and Mrs. Jayshree Katti ," Framework for Client Side AES Encryption Technique in Cloud Computing " ,IEEE(IACC),2015, pp .525-528.

[5] "Strength of QR Code over Design and Implementation of verification sytem System" Lokesh S. Khedekar and Prajakta S. Kale ,IEEE(ICCSP), 2016, pp .2190-2193.

[6] David Lorenzia, Jaideep Vaidya, Soon Chun, Basit Shafiq and Vijayalakshmi Atluri a," Enhancing the government service experience through QR codes on mobile platforms" ,Elsevier(Journal), 2014, pp .6-16.

[7] Wengang Hou , "A Fast Image Encryption Scheme Based on AES Yong Zhang, Xueqian Li ", IEEE(2nd ICIVC), 2017, pp .624-628.

[8] Eko Sediyono Satya Wacana Suhartono, "Secure Login by Using One-time Password verification sytem Based on MD5 Hash Encrypted SMS " ,IEEE(Journal), 2013, pp .1604-1608.