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INTERNATIONALJOURNALFORENGINEERINGAPPLICATIONSAND TECHNOLOGY

TITLE: AI-Based QR Code Scanning Any Vehicle At Catastrophic Accident

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Abstract

In the 21st century, In the event of a catastrophic accident involving multiple vehicles, rapid and accurate vehicle identification is crucial for effective emergency response and post-accident investigations. Traditional methods of identifying vehicles can be time-consuming and error-prone, especially when dealing with damaged or overturned vehicles. This abstract presents an innovative solution that leverages artificial intelligence (AI) and QR code technology to streamline the vehicle identification process in catastrophic accidents.

The proposed system utilizes AI algorithms to detect and decode QR codes affixed to vehicles, which contain crucial information such as vehicle identification numbers (VINs), owner details, and emergency contact information. In the event of an accident, first responders or accident investigators can use a mobile device equipped with a camera to scan the QR codes on the involved vehicles. The AI system then processes the QR code data and provides instant access to vital information, such as vehicle make and model, emergency contact numbers, and potentially life-saving medical information about the occupants. The advantages of this AI-based QR code scanning system include its ability to work in challenging conditions, such as low light or inclement weather, and its speed in identifying vehicles, even when they are severely damaged. Additionally, the system minimizes the risk of human error in manual data entry and retrieval, which can be critical in emergencies. By implementing AI-based QR code scanning in catastrophic accident scenarios, emergency response teams can significantly improve their efficiency and the quality of care provided to accident victims. This technology not only aids in quicker vehicle identification but also enhances coordination between responders and hospitals, helping to save lives and expedite accident investigations.

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1. INTRODUCTION

In day-to-day life, there is a lot of increment in population. Nowadays most people are using their 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 co-ordinated and stored by the database of RTO admin without much effort and it can access by both the user and vehicle inspector. We can digitalize all documents which are taken care of without so much effort and hard work. In existing process is done manually it takes lots of time and also many citizens have fake documents.

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

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

1.1 Information about Project

This paper proposed an approach to solving such problems that is by storing all the information related to vehicles and drivers in a database by the RTO administrator and an android application provided by both the vehicle inspector and user to retrieve vehicle-related information and we can add a provision to track a stolen vehicle. This project targets to store information related to vehicles such as insurance, license, PUC details, insurance details, personal details of the applicant, and registration date. This application would be installed on Android phones of traffic police and users. It will provide input fields to traffic police to enter the vehicle number as well as to scan the QR code to retrieve the information related to the vehicle and license from the database. This application also generates a fine if the user violates traffic rules and the location where it is undertaken for inspection. Hence it is a completely service-oriented application. The advantages of this application are considerably reduces the corruption in the transport department which means some officers try to bribe more while charging fines. Keep the license documents safely in the database with highly encrypted security algorithms. To offer the drivers to be independent of vehicle-related papers.

Fig-1: QR code

1.2 Purpose

AI-based QR code scanning for vehicles involved in catastrophic accidents could potentially be a valuable tool for first responders and investigators. Such a system could help in quickly identifying vehicles, accessing important information, and ensuring proper handling of the situation. However, it would require the cooperation of vehicle manufacturers to implement QR codes with relevant data on their vehicles, and the technology to scan and interpret these codes accurately would need to be highly reliable for use in such critical scenarios. Additionally, privacy and security concerns would need to be addressed when dealing with sensitive vehicle data.

2. LITERATURE SURVEY

Sr. no	Author	Year	Paper Title	Description
1.	Ms. Ankita V. Ghodke Prof. Rahul V .Dagade	2018	Electronic secure vehicle verification system using advanced Digi-Locker system(12CT).	User application and vehicle verification application. Improving Transparency in the system and lots of time should be saved.
2.	Mr. Nilesh R. Patil Prof. Rajesh Dharmik	2016	Secure cloud architecture for cloud service provider, WCFTR.	Cloud computing has been envisioned as the next-generation Information Technology (IT) architecture for enterprises and various private and public sectors.
3.	N. Karale Kalyanipendke. Prashant Dahiwale	2014	The survey of various techniques and algorithms for SMS security Shraddha. IEEE.	The most popular shortest and easiest textual form of communication is short message service (SMS).
4.	Mr. Niteen Surv Mrs. Jayshree Katti	2015	Framework for client-side AES Encryption Technique in cloud computing, IEEE.	Individual users and businesses use software and hardware that are managed by third parties at remote locations and also and this is done by cloud computing.
5.	Mr. David Lorenzia Mr. Jaideep Vaidya	2014	Enhancing the government service experience through QR code on mobile platform, Elsevier(journal).	One of the newest developments is the use of QR codes to quickly facilitate the storage of relatively large amounts of data.
6.	Mr. Wengang Hou	2017	A Fast Image Encryption	The decryption party uses the secret key and

			Scheme based on AES, IEEE.	initial vector to decrypt the cipher image to obtain the original image.

3. PROBLEM FORMULATION

3.1 Existing System

The main problem involves people stopping their vehicles on the road or toll booths to show their documents for their vehicles and then continuing their journey. This is not only a waste of valuable time for the driver and the police who take time to check the documents and return them. Sometimes the driver fails to carry the documents due to some reason and therefore has to put up with a fine. The current traffic rules and regulations are not very strong 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.

➢ No system or software identified unknown or accidental vehicle details.
➢ Police departments have some machinery but all are very costly (Expensive).
➢ Traditional systems or machinery don't have any updated OR code or without an AI system.
➢ Time-consuming system.

3.2 Proposed System

➢ We are designing a single universal software to identify unknown or accidental vehicles.

➢ This is Centralized software.

➢ This is cost-effective.

➢ Robustness and less complex.

4. RESEARCH METHODOLOGY & PROPOSED SOLUTION

A unique QR code will be posted on each vehicle. This QR code can be scanned by both the user and vehicle inspector by using an Android application. After scanning, all the details related to the 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 the issuer, which can be easily accessed at any time anywhere without any distraction. This will reduce the use of fake documents. This application will help to know the details of the fine and the amount to be paid. At the time of inspection, if any fines are charged, the vehicle inspector must be updated in the application and the previous fine charged can be known by entering the vehicle number. Vehicle inspectors cannot charge the existing fines and bribe more due to digitalization. The owner will get notified of the location when the vehicles are undertaken for an inspection, which will help the police officers find stolen vehicles quickly.
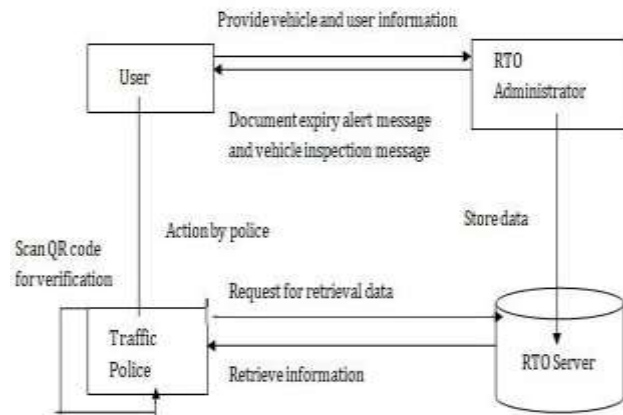
4.1 Working Principle

Fig -2: Proposed system

The above fig 2 shows newly programmed software doesn't require any manual work or going to the concerned 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 out any form to get the data. This software-based vehicle identification system reduces the load and makes the way easy to store all the relevant details regarding vehicles at a particular server and access it in one click whenever needed.

The 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 a QR code.

➢ Traffic police:- Scan the QR code and retrieve vehicle and user information. He can charge fines tothe user if he violates any traffic rules.

4.3 Processes

Fig -3: Proposed system

The above fig 3 shows the architecture of the unique QR code of the vehicle verification system consisting of the followingcomponents:

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

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

- ➢ User: Provide vehicle and personal information to the RTO administrator.

5. CONCLUSION

This system is proposed for implementing AI-based QR code scanning for vehicles involved in catastrophic accidents and offers several significant advantages. It enables rapid access to critical information about the vehicle, its occupants, and emergency contacts, allowing first responders to make informed decisions and provide timely assistance. This technology can potentially save lives by expediting the response time and ensuring efficient communication during high-stress situations. Furthermore, it can aid in accident investigations and insurance claims. However, to maximize its benefits, proper infrastructure, data security, and privacy measures need to be in place, and ongoing advancements in AI and QR code technology should be integrated into emergency response protocols.

ACKNOWLEDGEMENT

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