iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 7 **Issue:** IV **Month of publication:** April 2019

DOI: https://doi.org/10.22214/ijraset.2019.4036

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 6.887
Volume 7 Issue IV, Apr 2019- Available at www.ijraset.com

Advanced Security System using QR Code for catching Stolen Vehicle

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Abstract: In India, which is a developing country ,it always needs a significant improvement in infrastructure such as Roads or Highways. These constructions' of highways is costly, which can't be done by the government alone. Normally Public personal partnerships square measure made to construct such an enormous projects. The money spent on these projects can be regained by collecting toll from the passengers who uses the roads. The toll collection system, particularly in developing country like India faces some issues such as long queue lines, escaping from toll plazas etc. These systems can service only 300 vehicles per hour, and if more than that number of vehicles arrive at that plaza, server traffic jams may occur.
Number of crimes involving vehicle stealing has increased with the increase in number of vehicles. Although there are many strict laws being in place, thieves can still get a way to stay one step ahead and vehicle theft is still among one of the most reportable crimes worldwide.
To solve these problems, we propose QRCode based toll collection system. In our proposed system at the time of vehicle registration, QRcode is generated. We collect toll and identify vehicle is stolen or not at the toll collection booth.
Keywords: QR-Code, Electronic toll collection, Toll Authorities.

I. INTRODUCTION

If you are driving a long distance and are trying to get there as quickly as possible, you will probably travel along highways and interstates that allow you to travel faster and have fewer stops. These kind of roads have occasional stops where you have to pay money to travel on the road. These types of roads are called toll roads. The other name for toll roads is toll-way. You have to pay a fee called toll when using the toll road. Most roads are built with local, state or national government money raised from taxes. Toll roads allow new roads to be engineered and maintained without raising taxes on the general public. A highway doesn't always stay a motorway forever, though. Once the price of construction has been recovered from the tolls collected. You'll know you're on a highway once you encounter a piece of land. A gated space wherever you've got to cut down or stop to pay a toll to continue traveling on the road is called a toll plaza. There are many lanes with tollbooth available to reduce traffic as much as possible. Some lanes could have people operating the toll booths, so you will be able to pay the toll to respective collectors. Because number of vehicle are increasing rapidly, these lanes are getting slower and slower day by day. To solve this drawback we are aiming to use QRcode which will help in reducing the effective time taken at toll booths.
QR is short for Quick Response Codes. They are accustomed take a bit of data from a transient media and place it in to your mobile phone. You may shortly see QR Codes during a magazine advert, on an advertisement, an online page or maybe on someone's T-shirt. Once it's in your mobile phone, it's going to offer you details that business (allowing users to look for near locations), or details about the person wearing the t-shirt, show you a computer address that you'll be able to click to visualize a trailer for a show, or it's going to offer you a coupon that you'll be able to use during a native outlet. The reason why they're additional helpful than a regular barcode is that they will store far more knowledge then the traditional barcode.
In our project we have a tendency to use QR Code to store all info of car similarly as vehicle owner. QR Code can contain vehicle owner name, address, mobile number, email id, owner driving licenses number, vehicle number, vehicle sort, user sort like pass holder/ non pass holder, etc. Toll collector will scan the QR Code to vehicle authentication and toll collection.

II. LITERATURE REVIEW

A. Automated Toll Collection System Using GPS and GPRS

1) Author: Sudheer Kumar Nagothu

2) Abstract: Developing countries like India needs a significant improvement in infrastructure such as Roads or Highways. Construction of these highways is a costly affair, which can't be invested by the government alone. Normally Public private partnerships are made to construct such a projects. The money spent on these projects can be regained by collecting toll from the passengers who use the roads. The toll collection system, especially in India faces some problems such as long queue lines,

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escaping from toll plazas etc. These systems can service only 300 vehicles per hour, and if more than that number of vehicles arrives at that plaza, server traffic jams may occur. To solve this we are proposing to create geo-fences using GPS by giving latitude and longitude of the corner of the toll plaza. By comparing the position of the vehicle and toll plaza, the owner of the vehicle can be charged from the account.

B. Automated Toll Collection With Complex Security System

1) Author: P. Kamalakannan; M. Balaji; A. Avinash; S. Keerthana; R. Mangayarkarasi

2) Abstract: The paper is concerned with automated toll collection system using the active RFID tags; vehicles are made to pass through a sensor system that is embedded on the highway just before the tollgate. The system will electronically classify the vehicle and calculate the exact amount to be paid by the vehicle owner, ensuring no pilferage of the toll amount. Vehicle owners, who frequently pass through tollgates, are required to have a prepaid smartcard, which will deduce the appropriate amount, by using an automated smart card reader [1]. A Micro controller consists of a powerful CPU tightly coupled with memory RAM, ROM or EPROM), various I / O features such as Serial ports, Parallel Ports, Timer/Counters, Interrupt Controller, Data Acquisition interfaces-Analog to Digital Converter (ADC), Digital to Analog Converter (DAC), everything integrated onto a single Silicon Chip. The Microcontroller is connected with personal computer through RS232 data adapter

C. Automated fault detection in violation enforcement cameras within Electronic Toll Collection systems

1) Author: Anurag Ganguli; Ajay Raghavan; Vladimir Kozitsky; Aaron Burry

2) Abstract: Electronic Toll Collection facilities offer travelers the ability to pay toll electronically, most commonly via Radio Frequency Identification (RFID) transponders placed within the vehicle. ETCs are complex systems comprising of a multitude of sensing and electronics equipment. To prevent violation, photo enforcement cameras are used to capture license plate images of the violating vehicle. To ensure adequate image quality and integrity of these cameras, it is standard maintenance practice to manually review camera images on a periodic basis. The manual review process can be expensive, error prone and may involve only a fraction of the images actually captured. To address this problem, we present algorithmic tools that can be used to automatically review images to detect any potential camera faults, thus, reduce human workload and increase maintenance efficiency. Wherever possible, we use no-reference or reduced-reference approaches for fault detection

D. Secured short time automated toll fee collection for private group transportation

1) Author: Jaya priyaa CT; Y. Bevish Jinila

2) Abstract: Automated toll fee collection in Indian road has been widely anticipated. This has been a challenge because of cost and efficiency of these systems. This paper presents automated toll fee collection system in more efficient, faster, low cost and in very secure manner. Normal cameras are used to capture vehicle number plates and vehicle numbers are retrieved. Using the retrieved vehicular id the details of the owner and linked bank accounts are collected from database. The toll fee is deduced from bank account if amount is available else manually paid. If more than one vehicle belonging to a particular organization is present nearby toll then these vehicles are clustered to reduce the number of transactions made. One vehicle is elected as a cluster head and this vehicle represents all the cluster members and an ID based multi signature scheme is used for authentication. Experimental evaluation and analysis shows that the cluster based scheme performs better compared to non-cluster approaches.

E. Open road tolling in India by pattern recognition

1) *Author:* Dipti Jadhav; Manoj Sabnis

2) *Abstract:* Modern amenities, fast data transfer and minimum delay have now become the basic requirements of all the services. Transport services also have these requirements. Toll collection is one such service offered to transport system . Initially toll collection was manual but now due to development in various fields it is slowly moving towards automation. The system discussed in this paper is a full automated toll collection system. Number plate recognition is used increasingly nowadays for automatic toll collection, secure parking and law enforcement. Open Road Tolling uses video evidence to identify vehicle usage of a toll facility without the use of toll booths for toll collection without having to stop or even slow down to pay the toll. The application utilizes image processing and pattern recognition methods for Open Road Tolling. This paper presents Open Road Tolling (ORT) using number plate recognition. The proposed Number Plate Recognition (NPR) techniques consist of two

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modules: histogram based number plate localization and number plate recognition using template matching. This approach has an advantage of being simple & faster. This has come up in a large way in foreign countries, but not in India to that extent here it is still at the level of idea.

III. EXISTING SYSTEM

A toll collecter sits at the toll booth. The driver stops and pay the toll to toll collecter at every toll booth that he crosses. The toll collector determines the amount to be paid by each vehicle based mostly upon its characteristics or classification. Enforcement was mainly addressed by the use of gates that were raised after the toll was paid. Cash, credit/debit cards, and smart cards are mostly used manual way for collecting toll.

IV. PROPOSED SYSTEM

Combination of toll collection and vehicle identification system is included in proposed sytem. User registers on system, after registration QRcode get generated. QRcode contain all the information about vehicle and vehicle's owner. At tollbooth, toll collector will scan QRcode and identify user and vehicle. Also he checks user is prepaid user (pass holder) or regular user. If user is regular user then deduct amount according to method,or two way traveling toll charges. Every time after renewing of pass; generate new QRcode. If user is Pass holder he will be allowed to proceed and if user is regular user the respective charges will deduct after scanning of QRcode. At the same time we have a feature to identify vehicle is stolen vehicle or not.

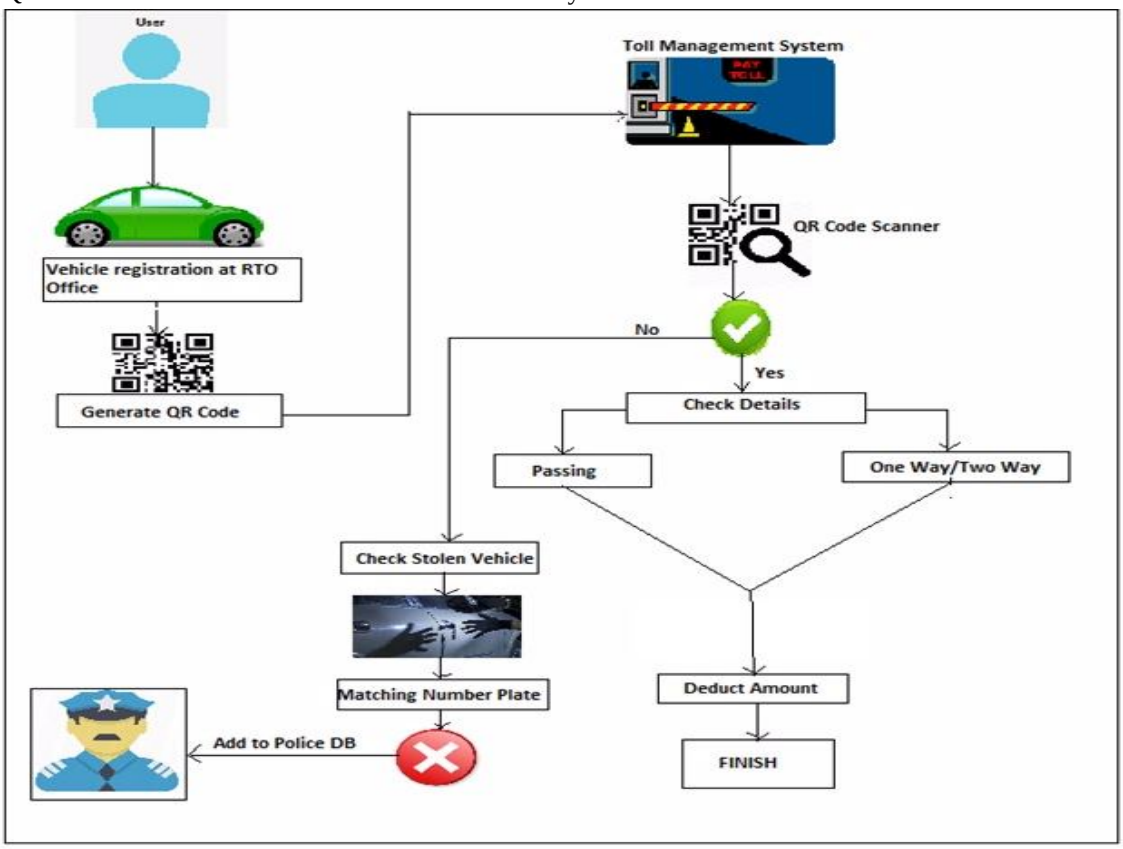


Figure 4.1. System Architecture

A. *Applications*

1) Automated Vehicle Identification.
2) Automated Vehicle Classification.
3) Automatic Toll Collection.
4) Can be used to catch stolen vehicle.

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B. Scope Of Project

Whenever the matter of Integration of systems comes to mind, we think of a system having the following important features viz. Accuracy: All the functionally bonded logical dependencies must be integrated. We are integrating vehicle authentication and toll collection. Efficiency: The whole system should work under all circumstances and on a long run it should work efficiently irrespective of their proprietary format. Cost Effectiveness: As our software do not require any special software for implementation hence is less costly as compared to other existing system. Also at client end, only one person is required for toll collection.

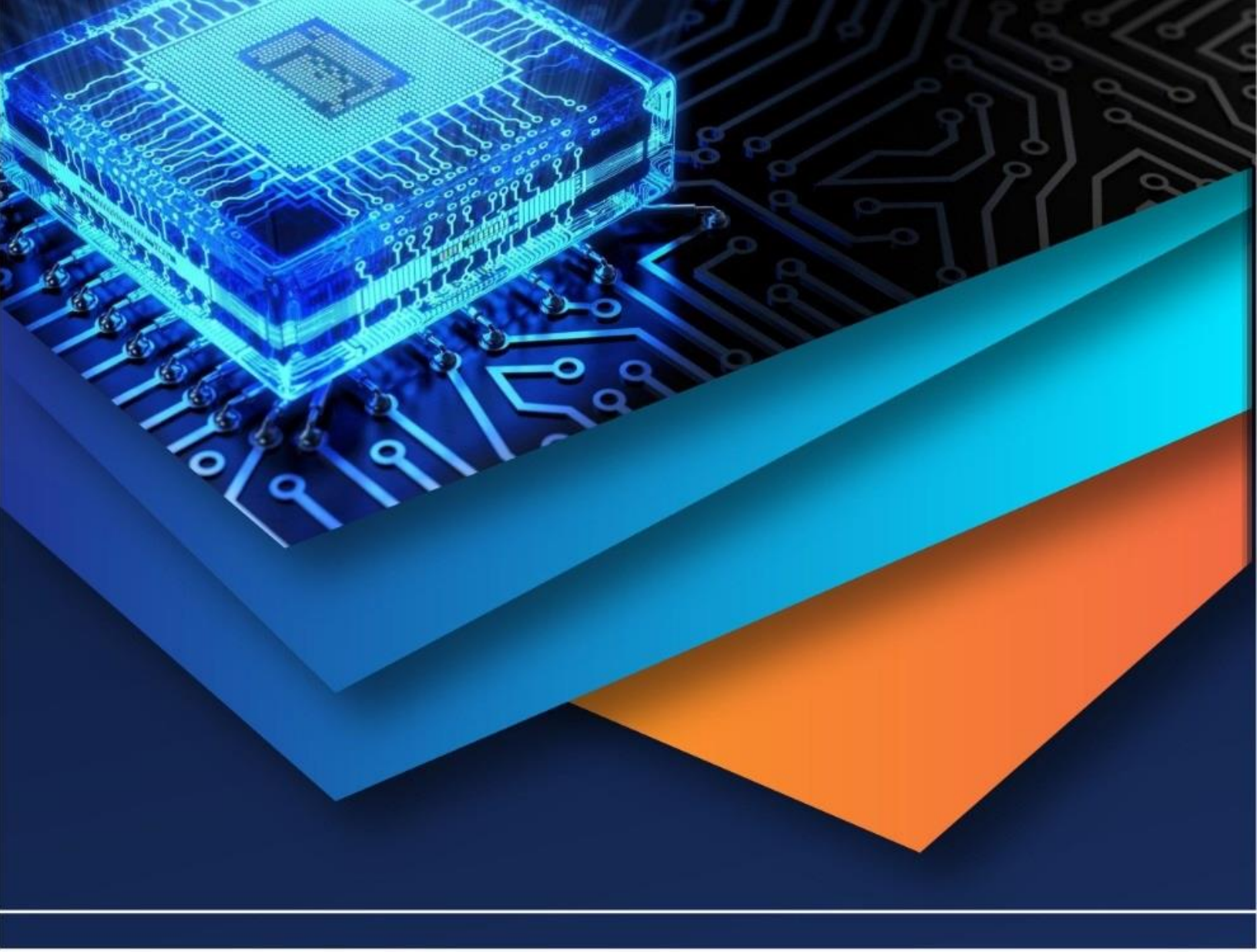
V. CONCLUSION AND FUTURE SCOPE

QR-Code is effective way to store information and handle stored knowledge. We propose effective and transparent toll collection system. Toll collector just need to scan QR-Code; all other operations are done automatically. Automation in toll collection reduce the time required for toll collection. Also propose system is capable of identify vehicle is stolen or not. This feature will track stolen vehicle

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