The Survey on Automated Toll System for Number Plate Detection and Collection

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ABSTRACT: The proposed Survey on Automated Toll System for Number Plate Detection and Collection is done for overcoming the toll booths manual system in today's days. The survey is on the money corruption, vehicle congestion, time consumption and the stolen vehicle detection. The mentioned problems are the biggest issues at toll booths. Today's tollbooths in India follow the manual process of toll charge payment. The survey is done to make such type of system which deduct the toll tax automatically and no wait for paying toll charge. By making the survey for automatic toll collection first the toll booths are works collectively with four main admins that are Super admin that is Government, Toll admin, RTO admin, and Police admin. This admins having particular work to done. The survey is basically base on the protocol of the system and not the real time implementation. The work of all the admins are as, Super admin having work to collect the correct count of money from toll admin, Toll admin having work to generate the report of the toll tax, RTO admin having work to register each and every vehicle pass through the toll booth, Police admin having work to register the stolen vehicle with their FIR number and detect the stolen vehicle.

KEYWORDS: E-wallet; Number plate detection; Tollbooths; Toll charge; Vehicle number plate recognition.

I. INTRODUCTION

The survey on Automated Toll System for Number Plate Detection and Collection is the survey done for the technique where collection of the toll charges is done electronically using Image processing technique. The survey is to remove the manual toll tax payment system. The system is the protocol of the real time system where the video or the images are taken as the input for the vehicle number plate identification. For that four admins and their work data are required such as Super admin, Toll admin, RTO admin and Police admin.

The previous system people have to pay the toll charge in manual basis where it cause large side effects as collection of toll tax cause time consumption, the receipt have to maintain for both the owner of the vehicle and the toll admin, by the manual process the vehicles get stuck in the same queue many long time by this vehicle s get congested at the toll plaza.

By this drawback when the vehicles are in the same place the owners of vehicle will not off the vehicle engine and by this the vehicles petrol or diesel get waste and it will also become biggest problem for the air pollution.

Another biggest issue in the manual system is the increasing rate of stolen vehicles, when the owner pay the toll tax the today's is not able to find or identify the stolen vehicle for that the survey is done to make the system which will identify the stolen vehicle passing through the toll booth. In this the police admin will maintain whole data of stolen vehicle along with FIR number and register the detected stolen vehicle.

The process flow of system is like first the pre-recorded video is taken as the input and then the vehicles are detected by the detector, the RTO admin will register all the details related to the vehicle and give the user id and password to that particular user by this the owner is able to access their account, then the vehicle number plate is then matches with the maintained database of the stolen vehicle this is done with the help of OCR algorithm to detect the number plate

and match it with the stolen vehicle data. If in case the match is found means that the vehicle is stolen then the message will get send to the vehicle owner and the police admin and if not stolen then the toll tax will get deducted from the owners account by E-wallet system and the transaction will successful.

After the whole day toll tax collected by the toll admin at toll booths they will generate the toll tax report from date to date and send the whole report to the super admin i.e. government and on the basis of that report the super admin will get the correct amount of money without any corruption in the money collection.

II. LITERATURE REVIEW

A. AUTOMATED TOLL BOOTH SYSTEM:
Rama Takbhate, Prof. S. D. Chavan, Volume 1, Issue 3, IJIRCCE, July 2014

In the journal the technique is to collect the toll tax with the help RFID base system to collect the toll tax automatically.

B. NUMBER PLATE DETECTION WITH APPLICATION TO ELECTRONIC TOLL COLLECTION SYSTEM:
Kannan Subramanian, Volume 1, Issue 1, IJIRCCE, March 2013

The detection of the number plate is the part of the image processing domain, the detection of the number plate in the above journal is done with the help of the camera and then process by using the OCR image processing algorithm and the collection of the toll is with the help of RFID system is done here.

C. AUTOMATED TOLL BOOTHS AND TRACKING SYSTEM FOR THEFT VEHICLE:
S. R. Jog, S. D. Chavan, Rama Takbhate, Volume 1, Issue 2, 2013

The major problem of the Country is the stolen vehicles. The journals make the tracking system like that it will capture the stolen or the theft vehicle easily and collect the toll tax.

D. AUTOMATED TOLL SYSTEM FOR NUMBER PLATE DETECTION AND COLLECTION:
Ankita Bhore, Bhawana nimbhorkar, Punam Pure, Priya Thombre, Volume 5, Issue 9, October 2016

The journal is to overcome the drawback of vehicle congestion, money corruption, time consumption and stolen vehicle. It uses the technique called image processing to detect the number plate and input the video and having the collection of number plates in the video.

E. AUTOMATED TOLL GATE SYSTEM USING ADVANCED RFID AND GSM TECHNOLOGY:
S. Nandini, P. Premkumar, IJAREEIE

The system is implemented for the toll tax collection automatically and eliminates the possible human efforts and sends the sms to the owner of vehicle by the GSM modem.

F. AUTOMATED TOLL COLLECTION USING SATELLITE NAVIGATION:
The toll system explained in the above journal is the automated toll tax collection system in which the advanced satellite navigation system is explained and used for the location of the vehicle to track.

III. PROBLEM IN THE EXISTING SYSTEM

A. CORRUPTION OF THE MONEY AT TOLLBOOTHS:
When the toll tax is collected by the toll admin the toll admin will not give the correct amount of money to government because of manual amount deduction the toll admin does not having the strong proof hence the corruption is more.

B. THEFT VEHICLES:

Today's biggest problem which is not solved by any system that is the stolen vehicle problem for that case the stolen or the theft vehicle is the biggest issue.

C. VEHICLES CONGESTION:

The vehicles are maintain the queue at the toll booths for paying the toll tax that is the waiting process because amount is taken by the toll admin by hand and then the receipt is given by the toll admin to the owner which is long process and makes the vehicles congested at the tollbooths.

D. WASTAGE OF THE PAPER:

The existing system is the manual system, in that the payment of the toll tax is by hand and after the payment the toll admin give one paper receipt to the owner by this the paper wastage get increase.

E. POLLUTION IN AN ENVIRONMENT:

At the toll booths the vehicles are get congested in to multiple queues and an owner of the vehicle will not turn off the vehicles and the carbon-di-oxide will get outside into environment log time at one place that increases the pollution.

F. TIME DELAY AND MANUAL SYSTEM:

Because of the manual process the overall time was got delay, that lead to the less powerful system which requires more time to pay the toll tax.

G. HANDLING CASH:

When the owner gets or passes their vehicle through the toll booth, owner pay tax by hand because of no automatic deduction system or the electronic system is available and it is the major problem

IV. OBJECTIVES

A. COLLECTION OF TOLL TAX:

The biggest objective of the system is to collect the toll tax automatically and give the correct count of money to the super admin without any money corruption by e-wallet system.

B. DECREASES THE RATE OF STOLEN VEHICLE:

The rate of stolen vehicle from the tollbooth is increases because no any prevention is available, for that by using the template matching algorithm to match the stolen vehicle number plate with the police admin database the stolen vehicle will get find.

C. RATE OF VEHICLE CONGESTION IS DECREASES:

The vehicles at the toll booth pay the toll tax manually and take the receipt this is the long process for each and every vehicle and by this the vehicles are get congested at the tollbooths for that problem the e-wallet system is build to make automatic money transaction.

D. TIME SAVING:

The existing system is using the "by hand" cash process and due to it the time will consumes more for that uses the e-wallet system to save the transaction time.

E. PAPER WASTE IS LESS AND ENVIRONMENT IS SAVE:

The acknowledgement of the toll tax payment is one paper receipt which is given to the owner and by this the paper is get waste and for that problem the sms gateway is used to send the sms to the owner for the acknowledgement of the toll tax deduction and save the paper.

F. AUTOMATIVE SYSTEM:

The system in the existing world is the manual system with the sequence flow and for that the automatic system is build to deduct the amount.

V. METHODOLOGY

A. IMAGE REPRESENTATION:

The image in the video will detect as a gray scale image. The gray scale image is an image in which value of each pixel is a single sample, which is it carries only intensity information. Images of this sort also known as black and white image are composed exclusively of shades of gray, varying from black at the weakest intensity to white at the strongest.

B. OCR ALGORITHM:

OCR stands for optical character recognition i.e. it is a method to help computers recognize different textures or characters.OCR are sometimes used in signature recognition which is used in bank and other high security buildings. In addition, texture recognition could be used in fingerprint recognition. OCR's are known to be used in radar systems for reading speeders license plates and lot other things. The goal of Optical Character Recognition (OCR) is to classify optical patterns (often contained a digital image) corresponding to alphanumeric or other characters. The process of OCR involves several steps including segmentation, feature extraction, and classification. Each of these steps is a field unto itself, and is described briefly here implementation of OCR. One example of OCR is shown below. A portion of a scanned image of text, borrowed from the web, is shown along with the corresponding (human recognized) characters from that text. An OCR algorithm will be use in the system to detect the number plates of the vehicle using gray scale image representation.

C. TEMPLATE MATCHING ALGORITHM:

The templates of all characters will be defined with some test points. The character will compare to those templates. The template with the highest match point will be characterized as an image. The system is capable to recognize car plate number automatically. After reorganization the plate number will be compared with the list of plate numbers in database. If the number plate is in the list of plate numbers then the system will allow further processing.

The algorithm will be use in system for matching the vehicle number plate with the stolen vehicle number plate database stored by the police admin.
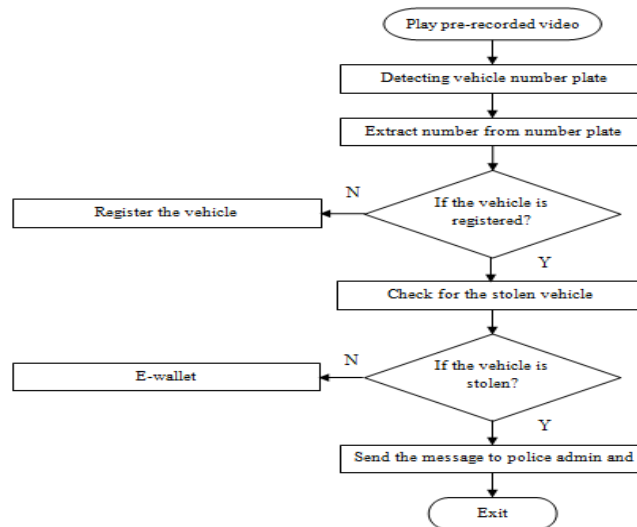
VI. FLOWCHART

Fig.1. Flow of The survey on automated toll system for number plate detection and collection

The system flow is start from the pre-recorded video because of the proposed system is protocol only not embedded, the video will get play which includes of the vehicles that video detect the number plate of the vehicles in the video and then extract the vehicle number from number plate then it check for if the vehicle is not registered, if vehicle is not registered then RTO admin will register the vehicle after that if the vehicle is stolen then the message will be send to the owner of vehicle and if not then the toll tax will get deducted from the owners account that is E-wallet.

VII. APPLICATIONS

A. APPLICABLE AT TOLL ROADS OR HIGHWAYS:-
The proposed proposal is for the toll booths to make them automative and advanced for the time saving and it applicable really for the toll roads.

B. APPLICABLE AT PARKING AREAS:-
The parking areas at companies having regular employees for that the amount of parking is will get possible to deduct by the e-wallet system.

C. APPLICABLE IN STOLEN VEHICLE IDENTIFICATION:-
The stolen vehicles are get catch up with the help of the image processing domain, by matching the passing vehicle number plate with the police admin database.

D. E-WALLET SYSTEM APPLICABLE AT THE PARKING AREAS:-
The amount deduction is get applicable at parking areas for overcoming the problem of vehicle congestion.

VIII. CONCLUSION

The problems of the existing system are more and they also create lots of problem for overcoming that problems the proposal is given.

The explained system will definitely overcome the problem by using the payment gateway and the sms gateway system. To decreases the vehicle congestion the system will based on the image processing saves lots of time at toll booths.

When the amount of the toll tax is get automatically deducted from the owners account without stopping the vehicle it is research that 86,000 crore diesel and petrol is save.

The proposal is to collect the correct toll tax, decrease the corruption and to reduce the fraudulent behaviour.

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BIOGRAPHY

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