

# A Novel Approach to Automated Centralized e-Challan System for Traffic Management

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**Abstract:** This paper presents a proposed system called the centralized e-challan System (CCS) based on the very common and growing problem of challans in countries like India. To solve such problems, we have proposed a novel vehicle document checking system, where information received by the traffic police has stored on a centralized server using a smart phone to save time. This application can be used to check all the documents related to that particular vehicle such as Insurance expiration date, Pollution under control (PUC) Certificate, and Registration Certificate (RC). In this paper, we also compared the CCS system to another existing system called Digi Locker. The main advancement of our system over the existing system is that CCS can also be used to examine documents issued by both governments and private companies.

**Index Terms**— e-Challan, CCS, Smartphone, Traffic Management, App. (*Keywords*)

## I. INTRODUCTION

In the present time, it is a very long process that the traffic cop will physically check the documents by stopping the vehicle. Sometimes the person has all the documents but forgets to pick them up while leaving from home. Today everyone remains busy in their respective lives. Most of them cannot afford to waste time because if someone wants to go somewhere immediately then stopping the vehicle for document checking wastes a lot of time. By using our proposed system CCS (Centralized e-Challan System) traffic cops can check whether the vehicle has all documents or not. If a cop finds that anyone else driving the vehicle rather than the registered person they can check the driving license for authentication and then if any certificate is not valid or expired the cop has to put fine on the person. If any documents are not valid or missing then the fine has imposed. Moreover, if the person is in a hurry and does not have the required documents then the person tries to bribe the cop. Sometimes cops also found taking bribe from the people which leads to a corrupt system. The app will have centralized control to higher authorities so no corruption can take place. If all the documents are valid person will be freed in a few minutes to move towards his destination rather than standing there and negotiating with cops. By using our proposed system there is no need of stopping any vehicle to check whether there are proper documents or not. The government also proposed to link the Unique Identification Authority of India with DigiLocker to push the country towards a paperless organization [1].

The major problem solved by our app is that it can provide documents issued by both government and private companies. Next, it eliminates the need to manually carrying various documents. Also, it relieves the person from the stress of always showing the papers manually. Police can view all documents and details by entering vehicle number in the app. Another electronic license management framework taken for the study, which coordinated the entire vehicle-related archives and stored each customer record and gave them an ID to check the e-License [2].

## NOVEL FEATURES:

- All documents in a single app.
- No duplicity or alteration of documents by the people as private and government companies will themselves upload the documents.
- Only verified documents will be available.
- Ensures detection of duplicate vehicle number plate, which also helps to find stolen vehicles.
- Contains documents issued by both government and private companies in the same app.
- Easy authentication of traffic cops.

## ADVANTAGES:

- Easy to use and saves time.
- No need for carrying different documents manually.
- All documents in one app and reduces corruption also.
- Help the people who are less familiar with technology and cannot operate apps since cops will themselves check the documents using the CCS app.
- Reduces the stress for the safety of documents.
- People can drive peacefully.

This paper has divided into five sections. Section 1 introduces the CCS system with its novel features and advantages. The rest of this paper is structured as follows. Section 2 describes related works with respective approaches. In section 3, the objectives of the proposed system have listed. Section 4 compared the projected system with the existing system and discussed the proposed methodology. Section 5 concludes the paper with the future scope.

## II. RELATED WORK

N. Jichkar et al. [3], *A Novel Approach for Automated e-Challan generation using QR codes and OCR (2019)*: This paper presents the concept that can be applied to create an e-invoice system. With the help of QR codes and automatic number plate identification on a vehicle can be used for vehicle model identification, owner identification, traffic control, and e-invoice generation.

M. A. George et al. [4], *DIGI-LOCKER – AN OVERVIEW (2019)*: This paper concentrates on public awareness level towards Digi-locker. They employed a sampling method to gather data from fifty respondents. Digi-locker is an app where anyone can upload and save records such as passport, DL, RC, and PAN card. It aims to eliminate the use of physical certificates and enables the sharing of verified electronic certificates.

P. A. R. Welekar et al. [5], *Analysis of Rules Violation & Efficient E-Challan Generation Using OCR in Real Time Traffic (2018)*: In this paper, the authors have proposed effective e-invoice creation technology using OCR (optical character recognition) in which an invoice has created using a mobile application. It detects diversity plates and details from the database and produces e-Challans.

B. B. Lonkar et al. [6], *Design and Monitor Smart Automatic Challan Generation based on RFID using GPS and GSM (2018)*: The authors have created an intelligent automated challan method that is based on RFID to obtain vehicle data when a traffic rule is broken and tracks the location of the vehicle via GPS. The server displays the information on the smartphone of each traffic policeman in a particular region. Traffic police can select offenses and penalties will automatically generated by the application and send to the server.

P. Bansod et al. [7], *Trans-Seva: E-Challan System using QR-Code (2017)*: This paper proposed a software application to help traffic police maintain fine information at a centralized server. In the current challan system, all tasks are done manually, which is time-wasting as the traffic police have to maintain the challan books also, and sometimes the police issue fake invoices causing corruption. Therefore, this task has an attempt to reduce the time required to prepare invoices.

III. OBJECTIVES

- The main objective of the proposed challan system is to include the documents issued by both government and private companies in the same app so that a person need not carry various papers physically.
- This proposed system does not only help in eliminating the pickup of documents but also saves our time that is wasted by physically checking of documents.
- Since this app will be used by the traffic cops, the person has no stress of showing the documents and can drive peacefully.
- By using this proposed system, there will be a decrease in the corruption cases as the report will be recorded by the app.
- Also, there exists a proper proof of expiry or unavailability of documents.

IV. PROPOSED METHODOLOGY

In this paper, we have proposed a vehicle document checking system, where information received by the traffic police is stored on a centralized server using an Android and iOS app to save time for filling details. Adobe Photoshop can use for user interface (UI) as graphic software for the initial design of the application. We have compared the CCS system to another existing system

called DigiLocker. DigiLocker is an initiative under the Digital India campaign launched by the Government of India. This project intends to transform India into a digitally capable nation and paperless governance. DigiLocker is an online portal for the issuance and verification of documents and certificates using digital mode [8]. The major drawback of DigiLocker is that it does not have documents of vehicles that have issued by private companies. The following table presents the drawbacks of the current system and how these drawbacks will overcome through our proposed system.

TABLE 1. LIMITATIONS OF DIGILOCKER

S. No.	Limitations of Digi Locker	Overcome by CCS
1	People upload their vehicle documents and can show them anywhere. Since only government-issued documents have available in the DigiLocker app, there is no need to carry them manually [8].	CCS app will contain all the documents of the vehicle issued by both private and government organizations. Firstly, the cop will enter their unique belt number, and then by entering the vehicle number they will see all the documents of the particular vehicle.
2	In some cases, people driving vehicles have not familiar with smart phones, they are unable to install or run the application properly.	CCS app can only be used by the Traffic Police. This will reduce the checking time and pressure on people, and also helps those who are not familiar with smart phones.

Another scheme has already present for e-Challan, which can record the speed and position of the vehicle using GPS, and further transmit a message to the police server including the vehicle owner that the e-Challan has issued due to over speed [9]. Every police officer has a unique identification number, known as a belt number. The proposed system has a home page with two options for traffic police, one for login and the other for their unique belt number registration, as shown in Fig. 1.

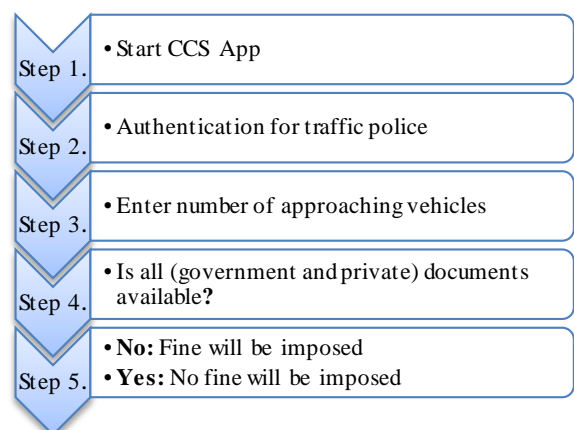


Fig. 1. Steps to verify documents using CCS

After login, the traffic police can enter the vehicle number of the upcoming vehicles. The data for each vehicle has already stored in a database at the RTO office,

Certificate, and Insurance Policy would be uploaded in CCS app by particular companies themselves so that duplication of documents has not possible. Whenever the private companies provide documents like insurance policy and PUC to the vehicles, they have to upload the

where documents of vehicles issued by the government have received. All documents such as Registration Certificate (RC), Pollution under Control (PUC) documents to the CCS server. Therefore, all government and private documents will be available in our app. If the police found someone guilty, only that person would be stopped and fined, as shown in Fig. 2.

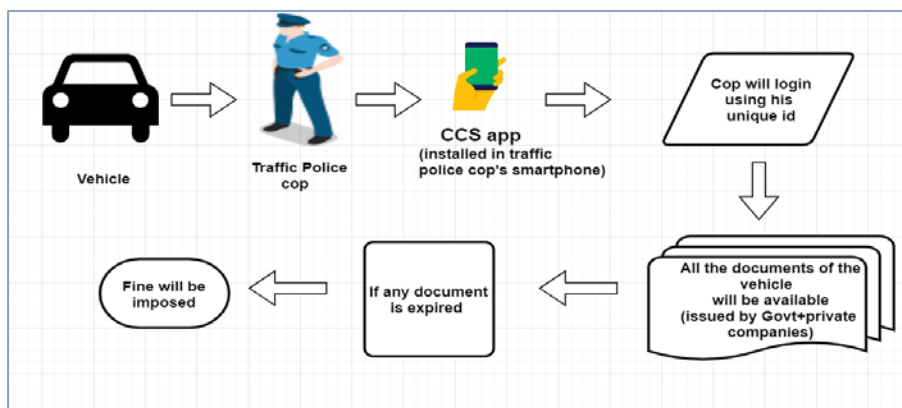


Fig. 2. Working diagram of the proposed system (CCS)

Apart from all these, the app will use a centralized cloud-based server that is open to higher authorities, which will reduce corruption. Research has begun in various technology fields of basic importance for the Cloud-based IoT applications such as using 5G [10]. Many other applications like an automated toll collection system used to automatically deduct taxes in which a unique radio-frequency identification tag is assigned to the vehicle that is known as FASTag [11]. In other cases, if the identity of a person does not match with the documents of the vehicle, the police may physically examine the driving license.

## V. CONCLUSION

This paper presented the features that can achieve to create a Centralized e-Challan System (CCS). There are some problems in the current DigiLocker system that can overcome with the proposed CCS system as discussed. The idea of launching this app is to make countries like India paperless. Many people forget to carry their full vehicle documents and result in more chaplains. All government and private documents will be available in the app. So with the help of this app, more transparency will be there. In the future, the verification method will create in real-time by preparing the e-challan in time, and offenders will pay the fine online using the available payment methods.

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