Smart Cop Application for E-challan and Women Safety

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ABSTRACT
This app is intended to file e challan by just scanning the number plate of the vehicle. Another function of this app is to get online live complaints along with live Geolocation with the help of Google maps APIs. We've also implemented the criminal history checker in app with which we scan recognize the face and check into database if person have active criminal cases. This app also enhances the women safety by a module getting live location of victim. This app provides a Notice/Circular dashboard, for the police to convey important notices to them so that they can act as soon as possible.

General Terms
Android Application, Traffic Penalty, E- Governance.

Keywords
E-penalty, E-challan, Traffic Violation, Women Safety

1. INTRODUCTION
Governance is a challenge in a country as diverse, vast and rapidly developing as India. India needs a new and latest technology for large-scale transformation and implementation of government plans. While India is among the fastest developing economies in the world, India's equitable growth remains a critical imperative. This project is an attempt in this very direction of e-governance for a country like India with a large population and high density.

Now you have everything at your Fingertips in real time.

Create your profile with your vehicles to get notified on New Challans Raised against your vehicles. So never miss a payment on your challans

Who wants to buys someone else's challans along with their vehicle or keep track of how obedient their dear ones are obeying traffic rules So now you can search for all pending challans on your vehicles and pay right then and there through the App or to list all the violation history of a particular vehicle.

We offer a lot of FAQ's and Driver education is definitely our Forte for betterment of road safety on our roads.

Firstly, the number plate of the vehicle will be scanned and the number will be recognized using the text recognizing API, then through the number of the vehicle all the data of the owner will be fetched using the vehicle RC details API. After that the Cops can easily file a challan against the offender and all the details regarding the challan will be recorded and will be saved in the database for later uses.

Secondly, through the app Cops will be able to save the faces of the offenders and can be easily saved in the database, all this can be done using the face recognition

API, also for client end that is for normal people especially for women, this app packs a feature for women safety which includes a feature of emergency button that triggers a function that executes as soon as it has been called which will send the current location of the victim to the nearby Police Station

Through the app the Police can be able to fine someone for various reasons such as over-speeding, red Light jumping etc. Fetching data from the app will make it convenient for the Police and to store all the fines for later inspection. We can further extend the project by implementing the facility for normal people to use the app and can communicate to the nearby Police station in case of an emergency like in case of stolen vehicles, so that they can complain the Police immediately. We are developing this application because in this today's lifestyle the workflow of Government servants like the Police has become very hazy and tough due to the current increasing population, which increases their work pressure, so this application can act as a companion for them as this will reduce their work, along with the women safety which is an additional and very key feature of the application. support needed for managing and monitoring traffic penalties. It is also a type of decentralized information system which allows all the stakeholders to access the needed information anytime anywhere. In the following sections a detailed Smartcop can make the process of challan very easy and less time consuming as it follows a very simple way of generating a challan :- 1. Whenever an officer notice a person violating the traffic rules he/she just have to capture a photo of the number plate of the vehicle from the smartcop application. 2. After this all the details of the owner and the vehicle will be fetched out from the database. 3. In the next step officer will give the violation inputs and the E- challan will be generated within few seconds. 4. The challan will be delivered to the registered mobile number and email address. Smartcop app for android devices will be written in Java 8 using Android Studio framework. Different Machine Learning models and APIs like Google maps and as per use are integrated with this application

2. LITERATURE SURVEY
A detailed study of existing projects and models is conducted to determine the most reasonable and effective model.

This paper [1] discusses the electronic management model of the challan electronic system and street punishment using the

existing integrated payment system in India.

The same method is followed by [2] using a model using an automatic challan system using MATLAB. The model takes a photo of the car and pulls out the phone number of the car that violates the traffic law. The model continues with automated E-Challan production processes that can be paid directly by the driver to the RTO office or can receive other online payments as well. This project focuses on extracting individual data from multiple sources. Paper [3] discusses the discovery of a traffic violation using a computer perspective. The model issues a license plate using a new in-depth learning network structure used to automatically acquire and obtain a license plate. The car is not available and the owner's details are released. The information is used to generate E-Challan and send a good instant message to the owner. The implementation of the entire model works very well and requires very little human intervention. A new method is proposed [4] using a picode that proposes a new e-challan system using coding and coding epicode code. This interviewed paper showed an effective way to learn a pickup and generate a challan for traffic violators using a QRcode encoder.This paper [5] proposes a web-based operating system using a database that records all traffic offenses committed across the country. It maintains a single database to keep a record and provides an online payment point for those who break the law. The project was developed using Python, Ajax, MySQL, Php and python.

The way the novel is discussed in the paper [6] proposes an effective process for generating e-challan generation using OCR, producing challan using the Android application. The app works by locating the plate, then downloading the data to the database and generating a challan. The same approach used by [7] raises the need for an effective and efficient disciplinary system. The authors suggest obtaining vehicle details from the official database using Smartphones, by scanning a QR code. The official can then generate an e-challan with the app and the challan will be sent to the driver via SMS.

This paper [9] introduces a system called TRuVIS (Traffic Rule Violation Information System) which is a notification system developed using Arduino, which controls, monitors and takes action against driver violations. The system creates a challan and sends a notification to the caller's phone. The application is specifically designed to control horn violations.

This paper [10] discusses the disadvantages of the echallan production process, the problem of counterfeit challans, loss of government and driver-related disruption. The author proposes an automated e-challan system based on RFID and GPS modules. The system is able to detect a car using GPS and the officer can generate a challan using the car details stored in the database, which will then be sent to the car owner via SMS.

3. METHODOLOGY
The paper presents a Android-application developed with a step by step methodology as discussed below.

3.1 Define the stakeholders of this Android application
There are 3 distinct type of users on the platform namely:

1. Traffic Police Personnel: The registered employee of the traffic police who can issue the challans to the drivers who have violated any traffic rules across the city.

2. Drivers: The licensed people who have been permitted to drive the vehicles across the city and have been issued a challan due to violation of any traffic rules. These people can pay and manage their issued challan on the platform.

3. System Administrator: The system administrator is responsible for the management of accounts of the above users and is responsible for issuing login credentials to the traffic police personnel, and insertion of new vehicle, driver and license details in the database.
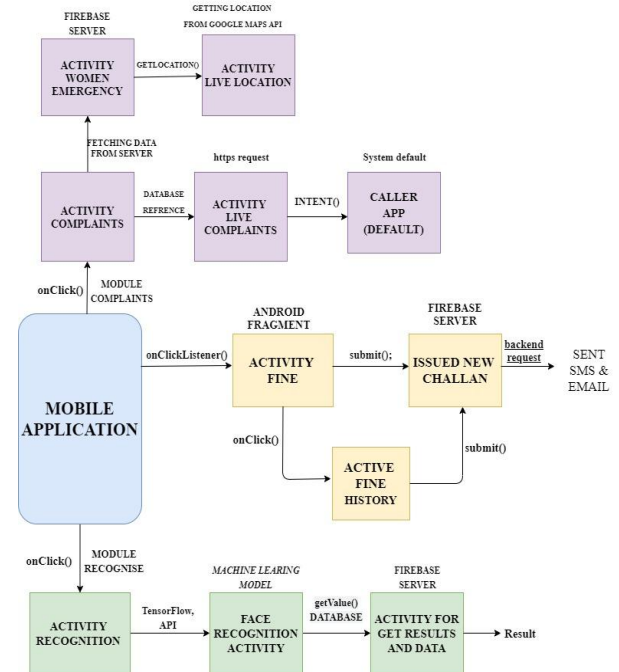

Fig 1: Data Flow Diagram of Smart Cop

The above diagram is showing the flow of data inside the Smart Cop app and clear the whole concept behind the app as it shows all the activities inside the android app.

3.2 Determining the Requirements of the Stakeholders
(A) TRAFFIC POLICE PERSONNEL:
1. The new personnel SHALL be issued an initial login ID and a password by system administrator.

2. The new personnel SHALL be able to generate his/her login ID and a password

3. The personnel SHALL be able to login using his or her ID and password.

4. The personnel SHALL be able to reset his or her password in-case he or she forgets it.

5. The personnel SHALL be able to input the details of the license.

6. The personnel SHALL be able to get the details of the owner of the license.

7. The personnel SHALL be able to input the details of the vehicle.

8. The personnel SHALL be able to get the details of the owner of the vehicle.

9. The personnel SHALL be able to input the details required for issuing the challan like offence, location, time and comments.

10. The personnel SHALL be able to issue a challan successfully.

11. The personnel SHALL be able to see the challan history of the driver.

12. The personnel SHALL be able to see the challans issued by himself or herself.

DRIVER:

1. A new driver SHALL be able to sign-up himself/herself using his/her general information like his license details, email and phone number.

2. The new driver SHALL be able to generate his/her login ID and a password

3. The driver SHALL be able to login using his or her ID and password.

4. The driver SHALL be able to reset his or her password in-case he or she forgets it.

5. The driver SHALL be able to view his challan history

6. The driver SHALL be able to view the challans issued to him by the traffic personnel.

7. The driver SHALL be able to pay the issued challans due for payment.

(B) SYSTEM ADMINISTRATOR:

1. The Administrator SHALL be able to login using his or her ID and password.

2. The Administrator SHALL be able to reset his or her password in-case he or she forgets it.

3. The Administrator SHALL be able to generate new admins by issuing them an initial login ID and password.

4. The Administrator SHALL be able to insert the details of the new vehicle registered.

5. The Administrator SHALL be able to insert the details of the new license registered.

6. The Administrator SHALL be able to generate new personnel credentials by issuing them an initial login ID and password.

7. The Administrator SHALL be able to get the details of personnel.

3.3 Determine the relationships between the different entities and classes
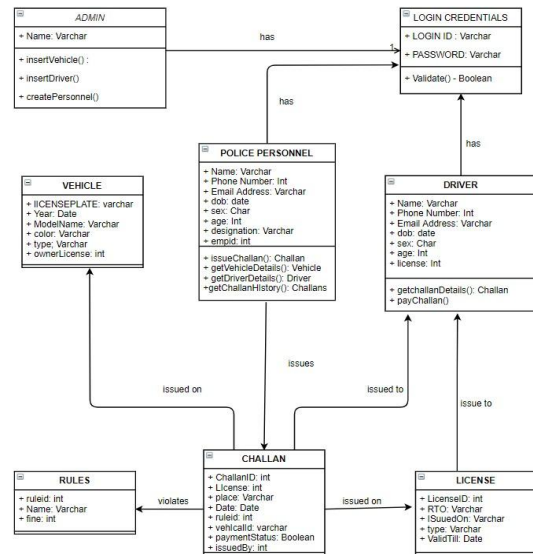
Fig 2: Class Diagram for Smart Cop

3.4 Using Technical Specs develop the Android application

The project has used a variety of front and back end frameworks for implementations such as:

1. XML: For front-end development

2. JAVA: For the in app coding used in Android development

3. Firebase Firestore: For real time database and powerful queries in android development

4. Machine Learning: Text Recognition API for recognizing text from an image and converting the same into a string to fetch vehicle details.

4. IMPLEMENTATION AND RESULTS

The application provides a number of features such as display vehicle details, display driver details, pay challan and issue challan. The core application of the website is to issue and pay challan, working of which is described in the following section.

Step 1: Personnel login:

The traffic police personnel login in the web- application using his credentials. On his desktop he/she can see all the functionalities which can be used by him/her. For issuing the challan the personnel click on the issue challan icon and an issue challan form is opened.

Fig 3: Personnel Login

Step 2: Issue Challan:

The personnel will identify the traffic violator and will enter his/her license no which will display the vehicles registered with the driver. The police personnel can select the vehicle, location and offence from a drop-down list, and then click on the issue challan button to issue the challan. The System will generate the challan and the details will be updated in the database.
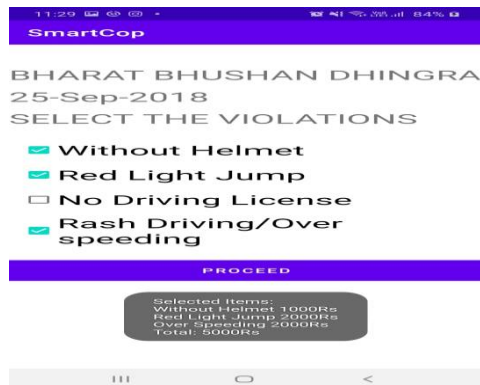
Fig 4: Selecting through various offences

Step 3: Women Safety:

For women safety the app has a panic button that tracks and fetches the current location of women and can send it to nearby police station


Fig 5: Notification Activity for Location

Fig 6: Panic Button Fetching Location

The next step will be by the driver, to whom the challan has been issued, the driver will go to his/her desktop and pay the challan.

Step 3: Payment of the challan by the Driver: Similar to traffic personnel the driver will login in the web- application and will arrive on his/her desktop. By selecting the pay challan icon, all the challans issued to the driver will be displayed, the driver can select the pay button corresponding to the challan he wants to pay, and after successful payment, the challan payment details will be updated in the database.
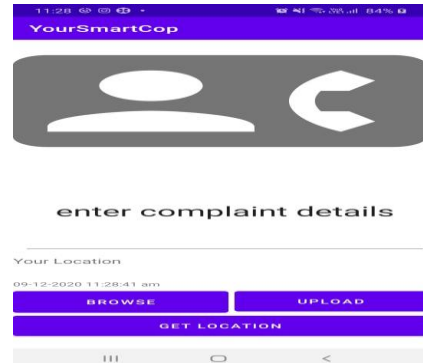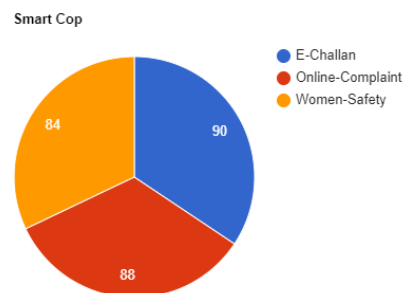

Fig 8: Entering Complain
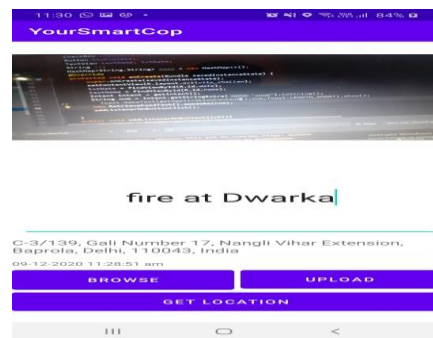
Fig 9: Sending Complain

5. RESULTS

Fig. 10: Pie Chart Showing the Accurateness of SmartCop

The other apps based on this idea were not precise as this version of the app and even this app includes the feature for women safety as the above pie chart shows that the percentage of accurateness is pretty higher for the various function inside the app

6. CONCLUSIONS

The project mainly focuses on issue and view or pay challan along with details extraction of vehicles, license numbers and challan details. The project can be extended to a full stack functional website in future providing other features such as license creation, RTO vehicle registrations and many more. The system can also be modified by using the latest technologies as discussed in the literature survey like QRcode and RFID scanner. This will limit human intervention and will

result in a more efficient model of the existing system.

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