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INTELLIGENT VEHICLE DOCUMENTS MONITORING

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Abstract— Now a day, population is increasing day by day and vehicles are increasing in twice ratio as everyone has more than one vehicle for convince. Vehicle contains many documents like Vehicle RC, Pollution and Insurance. These all have to updated after some interval of time and every document have different time duration i.e. pollution for 3 months, insurance for 1 year and RC for 15 years. Checking these of all vehicle owner is not possible due to which only some are keeping these documents updated and rest are not obeying law. So to make citizens to obey this law for updating their vehicle documents on time and if not then they have to pay challan defined by government. Hard copy of all document will be now converted into soft or virtual copy and all details will going to be stored in a Card like RC card and making it smart by containing details for pollution update time, insurance update time and RC update time and this card is also linked with user mobile number and contains permanent address too. On last date for updating document, user will receive message for updating and if not updated on same day then on next day challan will be generated and send to user address. By this, vehicles details are going to be tracked and law is going to be obeyed by everyone.

Keywords— Vehicle RC, Pollution, Insurance, Challan (Punishable Fine),

I. INTRODUCTION

Now a day every citizen of every country have at least one means of transport. As the ratio of population is increasing day by day and in comparative to vehicle, number of vehicle are increasing in just double in ratio. Now a day, everyone consider vehicle as bike, scooter, scooty or car as a personal means of transport. Instead of personal vehicle, many public means of transport is available like bus, mini bus etc. These all vehicles have some their own document that should me maintained and carried by vehicle rider or driver. These documents are vehicle registration certificate, insurance document and pollution control document. These all belongs to vehicle and are very important document to be always carried with vehicle. These documents are checked by

government officials as they contains information that should be updated time to time plus also shows the real owner of vehicle.

Vehicle registration certificate contain the information about vehicle; those are owner name, father/husband name, permanent address, vehicle registration number, registration date, engine number, chassis number, color, class, manufacturer, model, Body, wheel base, manufacture date, fuel, number of cycle, weight, seating capacity, standard capacity, vehicle C.C. and registration up to date. Vehicle registration certificate is in smart card format and all mentioned details are printed over that. This certificate or document is a proof that the vehicle is of owner mentioned over the card. [3] Government official checks RC to know that rider is legal to drive vehicle i.e. vehicle rider has not stolen this vehicle. If rider or driver identity is different from owner identity then there should be some type of relation between them otherwise rider or driver is created as wrong person that is examined by government officials. Normally the expiry date of vehicle registration certificate is 20 years and after 20 years it should get updated. [4] Vehicle registration certificate varies from country to country and some time from state to state, but main role of all is same and details over the document are same that are mentioned as it is standard followed by all countries but presentation varies.



Fig1: Current Vehicle Registration Certificate

Fig1 is showing image presentation of current form of vehicle registration certificate working with all details mentioned over the document in smart card format.



Second document that should be kept always while riding or driving vehicle is vehicle insurance document. This document assure that vehicle have insurance of its own and in case of any damage on bike will get claimed by user. Insurance is a very must document as it assure the maintenance plus the second sell amount of vehicle.[6] Details contained in this document are user name, vehicle number, engine number, chassis number, permanent address of user, vehicle color, model, manufacturer, manufacturing date, date of purchase, amount of purchased, selling amount, date of insurance, expiry date of insurance and signature of user and stamp of insurance company. [2] Insurance of a vehicle is done by user and it on user choice that from which company vehicle should get insured. There are many companies in market which provides insurance to vehicle and took charge of life and maintenance of vehicle. This insurance paper is checked by government official as they check whether the vehicle have the insurance or not. Insurance of any vehicle is done for 1 year of duration and after every 1 year; it should get updated or re-insured by company. Every vehicle must have this as it is considered to be a one of the important document that should be carried by vehicle rider or driver.

Fig2: Current Vehicle Insurance Document

Fig2 is showing image presentation of current form of vehicle insurance document working with all details mentioned over the document paper. Third and last compulsory document that should be kept always while driving vehicle is Vehicle pollution control document. This document assures that the pollution created by

vehicle is not going to effect the environment plus living beings. This document play a very important role as it is used to give knowledge about the process of combustion of fuel by vehicle is working properly or not. This pollution control document is provided by pollution checking center which are attached with fuel pumping stations. These stations check the pollution level of vehicle and also provide the printed hard copy to user. This document contains details that are vehicle number, owner name, owner address, vehicle model, fuel, pollution control number, Date of pollution, time of pollution, valid up to date. [1] Along with these details, the most important information or values that are mentioned over the document are CO (Carbon Monoxide) and HC (Hydrocarbons) Level that is measured by machine. The standard level of these are always mentioned which are, for CO – 3.5 and for HC – 4500 n-Hexn. These both level are measured in any fuel vehicle i.e. for petrol, CNG, LPG and diesel all. [5] The calculated value should be below standard one otherwise challan or punishable fine is charged over the owner because vehicle pollution is affecting environment and living beings too. This can be corrected by maintaining or delivering vehicle for good service of engine and all other parts too. This document is also checked by government official where the checks the value of CO and HC and before that checks the date of expiry as this document should be updated after every 3 months. Pollution emitted by vehicle are checked for small duration of gap as this checking is very fruitful and result in saving life and environment too.

Fig3: Vehicle Pollution Control Document

Fig 3 showing image presentation of vehicle pollution control document containing all details mentioned over the document paper. This document also contains one photo of number plate of vehicle which act like a proof that vehicle is gone for pollution checkup and mentioned values are correctly calculated.



II. PREVIOUS WORK

Any user or citizen who rides one or more vehicles always have to carry some documents related to that vehicle. Those documents can normally checked by government officials any time. Mainly there are three documents:

1. "Vehicle Registration Certificate (RC)"
2. "Vehicle Insurance Paper"
3. "Vehicle Pollution Control paper (PUC)"

These all are carried individually i.e. every document have its own separate presentation from other and rider have to carry all this otherwise punishable fine or challan get generated against rider. All these documents have their own individual expiring duration with are not matching with each other and carry all documents with each other is like a great responsibility over rider. Vehicle RC is in smart card format, so this make comfortable to rider to carry that but insurance and PUC is in paper format and are in big size (Approx. A4 sheet). So to carry paper always when riding vehicle is not comfortable and many time data over paper get wiped out which can also cause problem.

Now one more problem with current system is that, these documents are to be verified by government officials but checking documents of all vehicles in a single country or state is impossible due to population and also huge amount of vehicles too. Many users have three or four vehicle on his name, so checking for these documents in a state is impossible. As this system is not smart, so users are taking advantage from that as they don't update their vehicles documents and don't even carry them. Updating any document carries some amount and all users get skips to save capital which is indirectly harming country revenue and also harming environmentally. A huge amount of revenue get generated while updating vehicle documents which government uses for noble causes of citizens, but this revenue amount is decreasing day by day. Environment also get affected by this as PUC document contains some value of carbon monoxide and carbon dioxide that should be pumped out form vehicle engine, if value is not lying between the provided range punishable fine is charged and owner have to repair that part too, but if no updating or testing of vehicle is done then user will never get to know how vehicle affecting environment. RC document is in smart card format and contains information about vehicle and one chip is also mounted over that smart card which also provided information about vehicle and its owner details.

Currently over this system is running which is not smart enough and individually all document have to be checked which harming country drastically.

III. PROPOSED METHODOLOGY

This framework is oriented on intelligent acting way of vehicle registration certificate in which user or rider have to carry only one smart card while riding vehicle as a legal document of vehicle which should be carried by every rider. This smart card is actually a combination of Vehicle registration certificate, insurance and pollution certification of a vehicle. This smart card will act like virtually containing information about vehicle which will be seen or examined by government officials by scanning card over a machine which will display the information about vehicle which is usually checked by government officials.

This proposed framework can be established by considering following methods by researcher, they are:

3.1 Information Stored in Smart Card –

In this proposed framework, there is a formation of a smart card which will act as a document proof of vehicle. This smart card will contains all information which is contained by three different documents. The card is composed of combination of all details; those are owner name, owner permanent address, owner date of birth (DOB), assigned vehicle number, registration number, vehicle model, manufacturer, registration date, registration invalid date, vehicle CC, vehicle color, fuel, seating capacity, standard capacity, engine number, chasses number, owner digital signature, weight, body, purchasing rate, selling rate, insurance company name, stamp of insurance company, insurance date, invalid insurance date, insurance amount, insurance number, CO and HC standard values, CO and HC calculated value, picture of vehicle number plate, and pollution certificate number. Above mentioned attributes are combinations of all attributes contained in three documents. The smart card will contain all these details and these all will be virtually stored in the card and also a database is maintained which will manage and store these information.

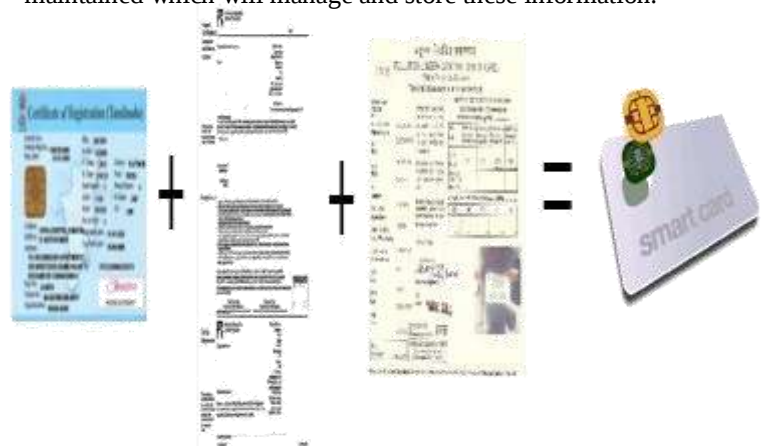


Fig4: One Smart Card Containing whole Vehicle Details



Fig 4 is showing that all three necessary document i.e. vehicle registration certificate, insurance and pollution control document details will get embedded inside one smart card which will be stored in virtual form.

3.2 Displaying Information –

After building up such smart card containing all mentioned and important details regarding vehicle and its owner, this information should also be able to seen by user as these are virtually stored in the card. Only registration number, vehicle number owner name and permanent address is printed over the card. But only this information is not sufficient for user as updating time for documents should be shown to owner for their convince. For such convince, website and mobile app will be created which will display the information like registration invalid date, insurance invalid date, pollution invalid date and CO and HC calculated and standard value to owner or user, and this will be displayed by entering the registration number and owner DOB.

For checking purpose, government official will have to scratch card like ATM or debit card, they will get the information over machine. Whole information access is also granted to owner or user and government officials are also able to access whole information. This whole information is also get access by same way and a button will be there “Whole Information” and by clicking on that, machine will display whole information stored over the server.

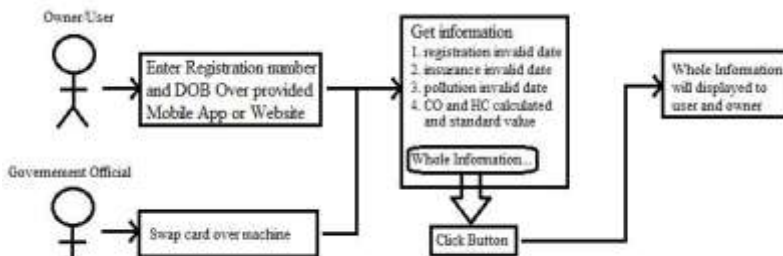


Fig5: Flow of Displaying Details

Fig 5 showing the flow of proposed system in which how owner and government official is able to fetch the information or details about vehicle. First step will display important details which is sufficient to get knowledge about updating and maintaining vehicle. To know full details about vehicle, whole information button is provided in first step which will display full detailed information about vehicle on clicking.

3.3 Updating information and warning SMS to owner –

Whole information stored over the server is not static as every document has some invalidate date and have to be updated. And if any documents get updated then, some values get changed which should be maintained by server. Updating

details option is not granted to owner as this information will get updated by officials those are actually updating vehicle documents.

Dynamic attributes will be owner name, owner permanent address, owner DOB, owner digital signature, registration date, registration invalid date, insurance company name, selling cost, insurance amount, insurance number, insurance serial number, company stamp, insurance date, insurance invalid date, CO and HC calculated value, Picture of vehicle number plate, pollution serial number, pollution date and pollution invalid date. These all mentioned information will be updated by registration office, insurance company and pollution control offices.

For more convince to owner, one more intelligence which will be performed by card is that, owners mobile number is also get attached with the card. Mobile number will be dynamic attribute and is only changeable by owner. Intelligence played by card will be that, after updating information it will automatically set a message

“Please Update registration certificate/ insurance document/ pollution control document” according to condition before 5 days and last day of Invalidation of registration certificate, insurance and pollution dates and will send in a SMS format with no incoming or reply feature. This will act like a intelligent alarm to owner for reminding the updating of vehicle documents.

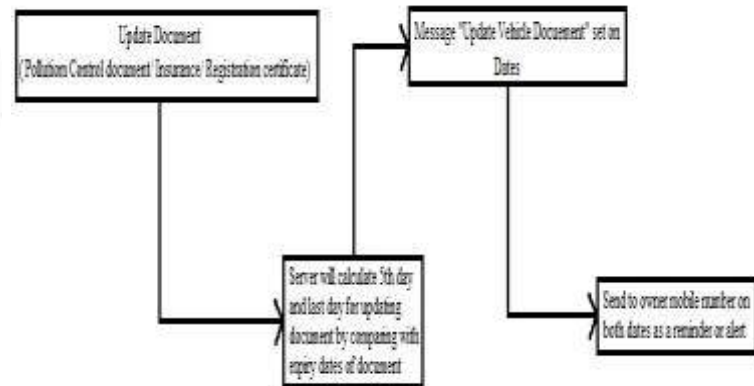


Fig6: SMS alert/reminder Flow

Fig 6 is showing the flow, how SMS alert/reminder will receive to owner and how server will selects the dates for this intelligence.

3.4 Automatic Challan (Punishable Fine) generation concept:

Intelligent way of alarm is provided to owner for reminding to update document. If still owner will not update the detail or information, automatically challan or punishable fine will get charged over owner after next date of invalidation. Challan



amount will vary according to the document to get upgraded and is generated by government only. Fine will be send daily until information get updated. After 10 days of continuous fine, the vehicle will get banned by government and registration will also get cancelled. After that, this vehicle will not allow to run.

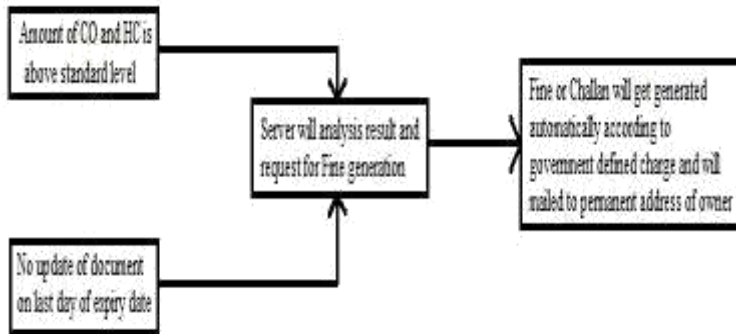


Fig7: Automatic Challan Generation Flow

Fig 7 determining the flow of how automatic challan or fine is get generated and mailed to owner permanent address. This is showing, which credential are taken by proposed system to generate automatic fine against owner of vehicle. The above mentioned points will properly helps to get implement this framework and will result very efficiently. The work flow of this whole framework is explained with the help of data flow diagram which will make easy to examine the work flow of framework.

Fig 8 is displaying the basic flow of proposed framework and contains all credentials should be taken while developing or implementing this system. This is showing how framework will act in every situation comes in front and how man force will get relaxed.

IV. CONCLUSION

This proposed framework will result in formation of intelligent vehicle document in smart card format which will contain documents information which are carried with vehicle i.e. vehicle registration certificate, insurance and pollution control document. Proposed system will decrease amount of documentation to be carried always and it will also result in increase in government revenue and also help to decrease the environment unhealthiness. It will decrease official man power to check these documents of every vehicle which is impossible as server which is maintaining details will automatically check the updating part of vehicle and will generate challan against that if caught faulty in any case. Server will also check the CO and HC level, if come out from standard range, then also fine will be charged. This proposed system will automatically maintain fine generation part. This will also maintain the record of vehicle and able to ban vehicle movement according to the situation. Proposed system will help to maintain the environment healthy, revenue generation from pollution checkup, maintenance of vehicle by owner, and vehicle will always be insured by any one insurance company depending on owner choice.

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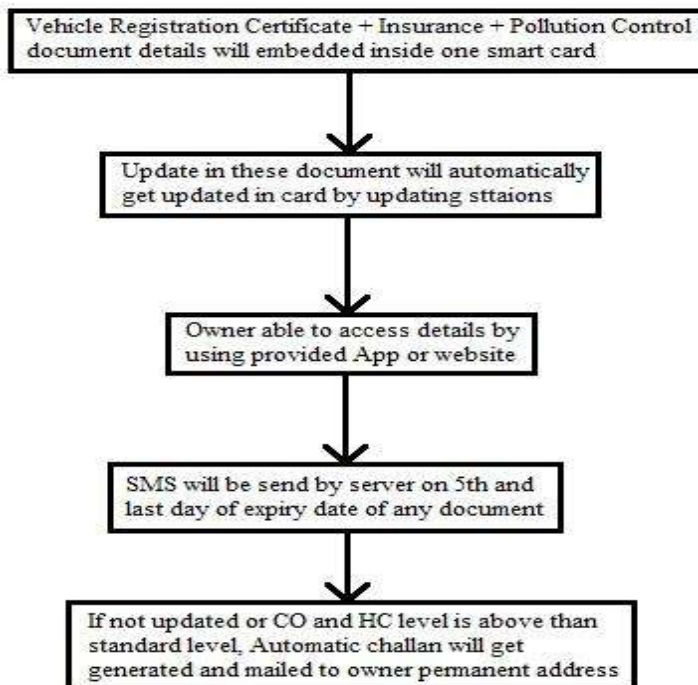


Fig8: Basic Flow of Proposed Framework



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