Vehicle Electronic Documentation Using RFID System

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ABSTRACT
In this paper, the improper maintenance of vehicle documents has been addressed. This paper presents the concept on maintenance of vehicle electronic documents using the RFID technology. The system also comprises the impact sensor for detecting the accident and send message to the nearest approaching ambulance and to a guardian. This system also underpins for the situation of digital world. This situation also supports for bribe reduction across the nation. By this concept the maintenance of vehicle documents will become more reliable in the nation. The details of the vehicle will be stored in the RFID tag and the data will be obtained the scanner from the cop side. The concepts also use the timer circuit for deactivation of the spark plug. The technology uses atmegamicrocontroller with RS232. The circuit uses GPS and GSM for security and location sharing purposes. After the due date is over the system gives the alert in the dashboard. If the owner is not responding to the alert then fuel supply will be detached. This concept will be futuristic and change face of motoring in India.

Keywords: ATMEGA controller, Fuel supply detachment system, GSM(Global system for mobiles), GPS(global positioning system), Zig-bee

I. INTRODUCTION

The fatal carriage of vehicle documents and reliability of maintenance of documents can be increased by this system. The conventional system has been probed for several days and according to the media statistics almost 90 percent of the vehicle owners are not maintaining the vehicle documents properly and on the other hand bribe in the nation is keep on increasing day by day. To provide a solution to these two issues we can up with a RFID system to maintain the documents. There is a vibration sensor used to sense the impact of the bike and transmits the information to the nearest approaching ambulance and a guardian. The main drawback of conventional method is it is a time consuming process and not be reliable to the drivers. With digital India and smart city scheme this concept will be flexible and utilitarian to the nation. Vehicle registration is very vital in nation and some people have practising of registering different vehicles for same numbers and different numbers for same vehicles in the area of smuggling and some illegal activities. In every nation vehicle

registration is mandatory according to the section 39 motor vehicle act, 1988 that falls under the section 7 of constitution of India.Section 39 prohibits driving of any unregistered motor vehicle and states that no owner of the vehicle should permit driving of an unregistered vehicle in public place, which is not registered under the provision of the MV Act. The exception to this provision is cars with the dealers. Section 192 of The Motor Vehicle Act, 1988, states that whoever drives a motor vehicle or causes or allows a motor vehicle to be used in contravention of the provisions of Section 39 shall be punishable with a fine, which may extend to five thousand rupees but shall not be less than two thousand rupees for a second time or subsequent offence with imprisonment which may extend to one year or with fine which may extend to ten thousand rupees but shall not be less than five thousand rupees or with both. There are several laws to protect the people which is boycotted by the Indian people. The motoring is one of the essential service in nation and laws are framed in the way beneficial to the people and the government.

Fig 1: CONVETIONAL SYSTEM

The conventional system is vehicle documents in the form of hard copy. It is huge herculean task for the cop. In the conventional system there is a huge chance of being fined or be bribed. The conventional system is dawdling for both the cop and driver. In conventional system the maintenance of documents is not satisfying the Indian drivers. Document material supplied by the government is simply a paper which won't be appropriate for the Indian climate condition and not to the Indian people. In the materialistic life people may fail to carry the proper documents with them. And on the other hand the poor vehicle space in two wheelers. And

in exceptional cases the proper driver will be fined even if the driver is fully furnished with every proper documents. In some developed and densely populated cities like Delhi and Kolkata are demanding proper emission control documents which is also not taken into the account by the citizens.As per the Section 3 of the Central Motor Vehicle Act, 1988 nobody can drive at any public place until he holds an effective driving license issued to him authorising him to drive the vehicle. A motor cab or motor vehicle hired by a person for his personal use or rented under a scheme to drive a transport vehicle is an exception. Section 5 of the Motor Vehicle Act, 1988 talks about the responsibility of the owner to not to allow one's vehicle to be driven by others. In the conventional system there lots of legal problems. There is huge chance of driving vehicle without a proper licence in the road. There are n number of crimes happening in the road from illegal documents carriage and missing of the documents. There is absolute need for strict traffic laws and its compliances as a number of road accidents are increasing day by day in the country. Rigorous road safety programs alone cannot ensure the road safety. There is a need to understand that we have not jumped on the road to enter a race or overtake others but to travel through it. We should not only ensure owns safety but others too by following traffic laws. The conventional system has fixed several fines for various illegal activities practised by the citizens. The conventional system is little bit outdated to the current situation of the country and on the other side the population of India is keep on increasing. At present stage India is one of the most populated country and supplying paper document to the every driver is not a feasible task. The process of receiving the driver licence again from the road transport office is completely tough task. Also in the conventional system duplicate and fake documents can be easily made and used by the people. The authentication fails and the misuse of Indian roads happens.

DEMERITS IN CONVENTIONAL METHOD :It is very hard to find the difference colour Xerox and the original. In current situation the burglar 's job become simple when he heist some vehicles in some densely populated cities like Delhi and Mumbai. The another possible way for a burglar to the change the chassis number by using some simple steps i,e heating the molten metal and changing the chassis number in the vehicle and also in the book. The conventional system never helps for the vehicle safety and authentication and safety level. The conventional system never helps the owner for their vehicle from be stolen. According to the statistics from the leading media "every 13 minutes in Delhi a vehicle is stolen". And unfortunately only 4 percent of the vehicles are recovered back to its owners.

Delhi saw 9,714 vehicle thefts in the the first quarter of 2016, up from 6,724 in the first three months of last year. By April 13, the number had crossed 11,000, according to police figures. Investigators blame the spurt on the creation of an app to register vehicle thefts, which has taken the pressure off local police stations to prevent and solve these cases.Car-theft investigations have virtually come to a standstill as no particular cop is held responsible any longer for unsolved cases. Investigators accept the situation is grim. Lack of deterrence has emboldened thieves so much that they are using techniques and gadgets to override the modern anti-theft systems. Not only do they carry duplicate electronic keys but can also neutralise engine control modules (on-board computers) in fuel-injected vehicles in a few minutes. All that thieves need is a window of 3 hours to dispose of a stolen vehicle sources said. Late at night, they can cross over into Haryana or UP from any place in Delhi within half an hour. Then, getting the vehicle to a salvage yard in places such as Meerut takes only about an hour more. Using deft hands and machines, the yards take apart a car in no time, and the chances of it be ing traced thereafter are practically nil. While many of the stolen vehicles are dismantled for parts, some are sold in Nepal, the northeast, and also Bihar and West Bengal. Till 2014, five-six gangs from Sotiganj in Meerut, and other areas in Uttar Pradesh and Haryana, were active in Delhi, operating in twos and threes. Today , the thieves travel in sedans in groups of six seven. They are armed to the teeth and take away two or three vehicles in a row.The outlying police districts that share borders with neighbouring states have higher vehicle theft rates, with the maximum cases reported from east and northeast districts that abut UP . While the theft rate has shot up, the recovery rate remains abysmal. On average, if 100 vehicles are stolen, only four are traced. Last year, 22,223 vehicles were stolen in Delhi and 6,019 of these were cars. At the end of the year, 2,322 were found. In 2013, the number of stolen vehicles was 26,330. It was 24,231 in 2012, and 26,729 in 2011.

2 ACCIDENT ALERT SYSTEM: One serious road accident in the country occurs every minute and 16 die on Indian roads every hour.1214 road crashes occur every day in India. Two wheelers account for 25% of total road crash deaths.20 children under the age of 14 die every day due to road crashes in in the country. 377 people die every day, equivalent to a jumbo jet crashing every day. Two people die every hour in Uttar Pradesh – State with maximum number of road crash deaths. Tamil Nadu is the state with the maximum number of road crash injuries Top 10 Cities with the highest number of Road Crash Deaths (Rank –Wise):Delhi (City) Chennai,Jaipur,Banglore,Mumbai, Kanpur, Lucknow, Agra ,Hyderabad and Pune. A Report on Road Accidents

in India 2016, published by Transport Research wing under Ministry of Road Transport & Highways, Government of India, has revealed that more people died on roads accidents in India last year, as compared to the number of deaths in 2015. The data has further revealed that the states of Uttar Pradesh and Tamil Nadu have accounted for maximum number of deaths this year. As per the data cited in the report, the country recorded at least 4,80,652 accidents in 2016, leading to 1,50,785 deaths. The number suggests that at least 413 people died everyday in 1,317 road accidents. Further breaking down the statistics, the data reveals that at least 17 deaths occurred in road accidents in 55 accidents every hour in the given time period. Comparing the new recordings with data from previous year shows that in spite of recording fewer accidents in 2016, more deaths have occurred this year as in 2015. In 2015, 1,46,133 people had died in 5,01,423 accidents. The accident severity, which is measured as the number of persons killed per 100 accidents, was recorded at 29.1 in 2015 which is lower than 31.4 in 2016.The report further revealed that Highways are not the "biggest killers". As per the report, 34.5 per cent accident deaths occurred on National Highways, while 27.9 per cent accident deaths took place on State Highways, while maximum percentage of deaths occurred on other roads (37.6). Giving insight into the cause of accidents, it further added, that speeding appears to the be the biggest cause of concern, other than usage of mobile phones while driving vehicles. While speeding led to 66.5 per cent of all road accidents and 61 per cent of deaths, usage of cellular phones caused just below 5000 accidents and over 2000 deaths.The study went on to list Chennai as the city with most dangerous roads, as it recorded 7,486 accidents in 2016, followed by Delhi which recorded 7,375 accidents. Bengaluru, Indore and Kolkata, rounded up the top five positions in the list, respectively. With 12.8 per cent of total road accidents, the state of Uttar Pradesh saw the highest road accidents, followed by Tamil Nadu (11.4), Maharashtra (8.6) and Karnataka (7.4).An interesting discovery of the report was the fact that cities with a large population saw majority of accidents. The report said that 50 cities with million-plus populations accounted for 18.7 per cent of all road accidents and 11.8 per cent of all accidents deaths. The report also found that newest vehicles featured in most of the accidents. Vehicles with usage age of 0-5 years featured in 40.3 per cent of the accidents, while those of 5-10 usage years featured in 32.7 per cent of accidents

3. PROPOSED SYSTEM: The proposed overcomes the demerits of the existing system by replacing the hard copy documents into the reliable electronic documents. Also useful in detecting the accident location very accurately. And also reduces the chance of reducing the bribe.

OBJECTIVE OF THE PROPOSED SYSTEM: To reduce the bribe rate across the nation and to increase the reliability of maintaining the documents. Integrating the transport department with digitalisation. And also to reduce the usage of cop for verifying the vehicle documents. The concept will also furnish for the smart city.
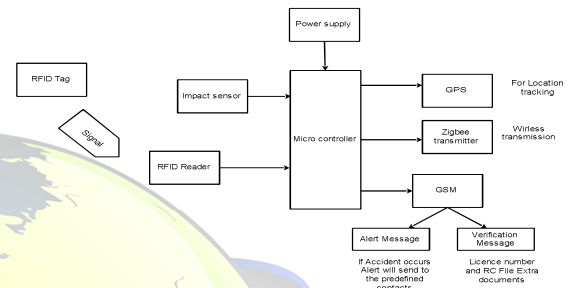
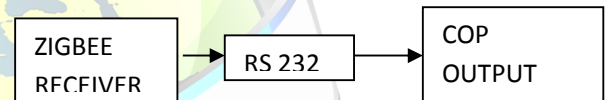**BLOCK DIAGRAM FOR PROPOSED SYSTEM:**

FIG 2: TRANSMITTER SIDE

FIG 3: RECEIVER SIDE

The merits of the proposed converter can be summarized as follows:

1) The fatality of carrying documents is reduced.
2) The probability of being fined is reduced.
3) The accident location is tracked instantly.
4) Reliability of maintaining documents is increased.
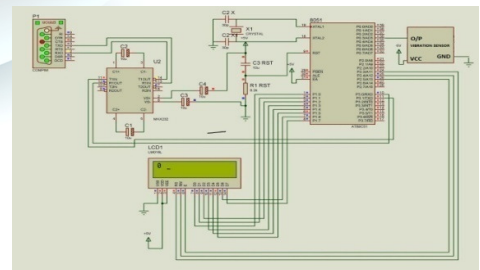5) Bribe rate across the nation is reduced.

FIG 4: ACCIDENT ALERT SYSTEM CIRCIUT

WORKING: The accident alert system uses the vibration sensor to predict the impact on the bike. The LCD will be replaced by the mobile phones to display the location of the impact. The LCD will display the exact longitude and longitude through the GPS and

GSM. The circuit uses crystal oscillator to achieve 11.09 frequency and capacitor underpins the oscillator. The crystal oscillator is connected to the XTAL port. The system primarily messages to the approaching ambulance and the guardian. The system uses high spec GSM 800A to transmit message to the nearest ambulance and the guardian. The GSM will be connected to the TXD and the GPS is connected to the RXD. The GPS and GSM uses 12v supply and other unit uses the 5V supply. These two power supply is taken from the vehicle battery. There will be back up battery for the GPS and GSM. The backup battery will be charged from the vehicle alternator. The presence of backup battery makes the system more reliable. The main reason for using the AT895C1 is highly reliable for the GSM and GPS.
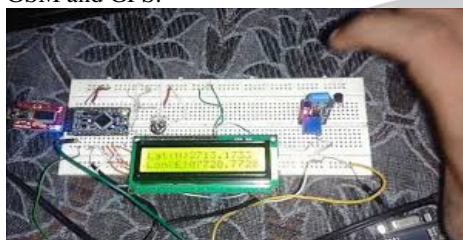

FIG 5: OUTPUT OF VIBRATION SENSOR

This figure displays output of the vibration sensor displayed in the LCD. The LCD displays the exact location of the impact and by the use of GPS and GSM we can transmit the message to nearest medical service and one of the preferred guardian.

(2) FUEL SUPPLY DETACHMENT SYSTEM: This system uses to detach the fuel supply from engine from the tank. This happens only in the exceptional cases if the driver not responds to the alert from the bike. This system used to for proper maintenance of insurance of vehicle. This system will be making use of the ECU in the vehicle. This system used to properly furnish every vehicle with insurance without cop. By this system only proper vehicle with insurance can hit the Indian roads. For calculating the time period the timer circuit is used and it will be preset for preferred time period. The time period will be changed according to the drivers choice. The main advantage of this system is it does not make use of the cop for insurance segment. This system will be highly reliable than the conventional method. This system will also bribes rated caused due to insurance due and at the same time insurance company also receive proper insurance cost. No need of the cop to track the specific vehicle without the insurance.

VEHICLE WITHOUT PROPER INSURANCE IN INDIA: Nearly 60% of the vehicles plying on Indian roads are uninsured, most of them motorcycles and scooters. The data has been complied by GeneralInsurance Council. In 2015-16, India had around 19 croreregistered vehicles; of these, only 8.26 crore were insured. The mass number in the insurance count lag will aid the police man to demand bribe. Many people fail to renew the insurance amount.

MERITS OF FUEL DETACHMENT SYSTEM: The fuel detachment system will avoid the vehicle which runs without proper insurance. The bribe demanded by the cop will be reduced for insurance. The insurance companies will receive the insurance amount regularly. The fuel detachment system will be enabled using the cloud computing system. This system

3) RFID storage and retrieval: This is the heart of the concept. This system used to store the vital details of the vehicle. There will be RFID sticker and the data will be stored inside the sticker. When the cop scans the sticker and he receives the information on the screen. Every details of the vehicle including the emission certificate will be displayed in the cops output device. If any one of the data is missing according to government standards then the fine will be funded electronically to government. This reduces the chance of bribe in nation. This technology replaces conventional hard copy verification by digitalisation. The system will also simple for sales of the vehicle. Since the change of owner is done in simple steps. The system also displays the history of owners and the speed history. This system will help to maintain the authentication level. The RFID can store and retrieve the data within milliseconds. The technique will be furnishing for the digital India and smart city scheme in the nation. This technology also feds for the easy tracking of the vehicle in the future. The reason behind the technology is there will be tollgate enhanced with the cloud computing technology with the highways and road transport department. This will be helpful to track the exact location of the vehicle by the help of the tollgate. This system can be made flexible for tracking the narcotics in the nation. In some exceptional cases the driver may escape from the cop and also the device failure. To avoid this stage and fulfil the ideal smooth transportation. This electronic tollgate tracks everyvehicle and check every parameter in milliseconds and process the output. If the parameter is not according to the government standards then the vehicle will be blocked at the spot. This technology will be ideal for the tire 1,2 and 3 cities. Cities such as Delhi and Kolkata is facing some legal and some environmental issues and this technology will helpful to overcome this issue the emission certificate will be integrated with the RFID sticker and the details will be retrieved and displays the last emission tested rate and amount of the emission the vehicle produced at the current day. This concept will flexible for the odd even

test by programming from the vehicle database to enhance the odd number vehicles for certain days and the even number of vehicles for certain days. It is not possible to drive the inappropriate vehicles. The cloud computing is more added advantage to the government by blocking the irregular vehicle from the control room itself. The FC (fitness certificate) will automatically updated by using the timer circuit. There isa issue faced by the truck and government buses without updating the FC and using on the roads. The RFID uses the microcontroller with the specification ATMEGA AT89C51. The reason for using the microcontroller is for easy enhancement of the GSM and GPS. The circuit will be simple and we can attach more memory and the ports.
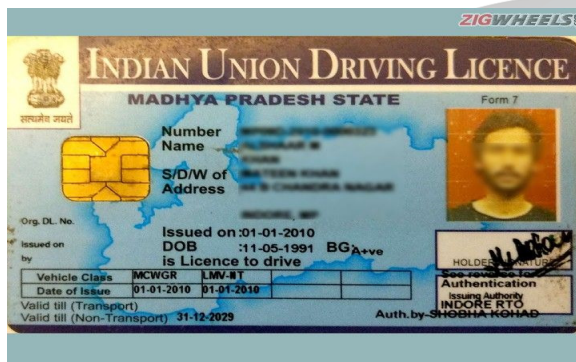

FIG 6:DRIVING LICENSE DISPLAYED IN THE OUTPUT SCREEN

The government will hold the authorities to feed the details of the owner and their respective vehicle inside the RFID. The above details will be displayed in the cop device. The licence will be renewed automatically after the due date. This system changes the faces of motoring documentation in India.
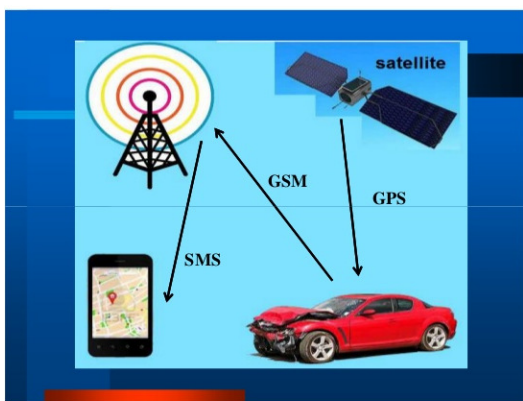

FIG7: REGISTRATION COPY OF THE VEHICLE

The above figure represents the REGISTRATION COPY (RC) of the vehicle which will also be stored inside the RFID sticker.

FUTURE SCOPE: IN 2020 India announces futuristic smart city and digital India. This concept will be furnishing these two schemes. By the use of the smart toll collection gates the driver may save some more time by using this RFID system. The concept will be made flexible that the toll draws everyvital information of the vehicle and also the travel history of the vehicle. This helps the police to track the vehicle which is stolen or smuggled. It also reduces the chances of carrying some narcotics in it. In future the process of buying a new vehicle and registering will be made simple and done in some simple steps. The burglar rate and bribe rate will be reduced. The chance of driving a vehicle without proper documents is reduced. The accident location can be instantly tracked and follow the appropriate action. The accident location will be accurately spotted and in future there will more toll gates and the message will be given to the nearest toll gates and the guardian. It is also possible to track the vehicle details and check the details of the vehicle within milliseconds. If the details are not satisfying the government then the vehicle is abducted to make the pay. In future the Indian drivers won't face problem for renewing the license and loose their documents. Since the documents is integrated in the vehicle and when the vehicle is sold to the second hand market only electronic update is required. In future the transport system will be connected to the government via cloud computing the authentication of the vehicle is increased. It is possible to control the owner's by the computer using the computer. Automated vehicle identification (AVI) is the process of determining the identity of a vehicle subject to tolls. The majority of toll facilities record the passage of vehicles through a limited number of toll gates. At such facilities, the task is then to identify the vehicle in the gate area. The smart city is urban area that uses different types of electronic data collection sensors to supply information which is used to manage assets and resources efficiently.[1] This includes data collected from citizens, devices, and assets that is processed and analyzed to monitor and manage traffic and transportation systems, power plants, water supply networks, waste management, law enforcement, information systems, schools, libraries, hospitals, and other community services.

malls and various hotels which will be used to track the vehicle location very accurately. The response time can be improved by using dedicated processors instead of computer systems capable of processing the images in real time.

4. CONCLUSION: This system will be futuristic and helpful in making the nation bribe free in future. To make the country developing from developed digital is the only tool. This concept is purely based on the "DIGITAL INDIA" revolution. Since the cash transaction is e-based. This provides solution to the improper documentation and anti bribe. This very advantageous than the conventional in several ways. It creates several job opportunities in the future for computational and the electronics segment. The insurance covered vehicles is only 40 percent the rating will be increased. There are many future concept technologies like solar road ways and some electric cars. The system uses GSM 800A module which can transmit the data very accuracy and speed. By this concept there won't be need of the RFID fast tag the vehicle details and the bank accounts can be linked using the cloud computing technology. The RFID reader will be fixed in several public places like shopping

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