ADVANCED SYSTEM FOR TRANSPORT MANAGEMENT AND CHALLAN DETECTION

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ABSTRACT

Radio frequency identification (RFID) technology has moved from insignificant applications into mainstream applications that can be used to handle the manufactured goods and materials to identify the objects with a very high speed and to record metadata or control individual target through RF waves. By attaching RFID reader to the Internet terminals, the readers can recognize, trace and observe the objects attached with tags automatically in real-time.So, with the help of RFID Technology and other add-on technologies such as Wi-Fi and Arduino, we can't only reduce manual load and increase automation but also provide better user experience, keeping people free from daily troubles at Parking Lots, Challans and the need of worrying about Vehicle documents and Transportation challans.This would further lead to the peace of mind and thus indirectly would increase an individual's productivity and also would help the Government to maintain transparency in Challans by introducing automatic challan system. Through this, we can easily cut down manual labour, introduce smart systems, increase operational efficiency in various smaller transportation divisions that are often neglected (such as parking, challans and documentation), reduce the time delays while travelling, transact Cashless and digitally, decrease the traffic congestion, decrease the air and noise pollution caused by long slow entering vehicles in the parking lots and make challans automatically for red light jumping and overspeeding. This paper presents the overall design of the transport management system with low cost and wireless system.

INTRODUCTION

In past few years, radio frequency identification (RFID) technology **[1, 2]** has moved from non-recognized applications into more conventional and recognized applications that assist to handle the manufactured goods and materials without so much delay. RFID enables identification from a distance and unlike some other technologies based on bar-code techniques, it is able to achieve this without line of sight. RFID tags support a broader set of unique IDs than bar codes and can

incorporate additional data such as manufacturer, product type and even measure environmental factors such as temperature. In present days, many types of RFIDs exist but at the highest level, RFID devices may be categorized into two different types: active RFID devices and passive RFID devices. Active RFID devices need a power source—they're either attached to a powered infrastructure or need energy stored in an integrated battery. Passive RFID devices are of interest because these tags don't require batteries or maintenance. The tags also have an uncertain life of operation and are so much compact that they are suited for apractical adhesive label. A passive tag is made up of three parts: an antenna, a chip (made up of semiconductor) attached to the antenna and some form of encasing.

HOW TO USE RFID TECHNOLOGY?

In this paper,we use RFID reader and tag **[3]**for sending the information of the vehicle to the server through the Wi-Fi module that may also be used for checking the documents**[4].**We use RFID technology for the Automatic Challan system; this challan system has two applications:

- Automatic challan system for crossing traffic light:
  The central concept is that if the red light is activated and if in that time the car crosses the red light, then automatically challan would be generated. After generating the challan, the fine would be added to the main bill.

- Automatic challan system for over-speeding of vehicle:
  The function of this type of system is to detect the infringement of traffic continuously**[5]**; the system continually measures the vehicle speed and comparesthe measured speed with the specified speed limit of that particular location to identify the over-speed. In this system, Global Positioning System (GPS) technology is used for the speed measurement. GPS performs measurement and provides speed and coordinates of that location. The next step is to compare & measure the speed with the specified speed limit supplied by the database of coordinates and their corresponding speed limit. If the vehicle's measured speed is lesser than the specified speed limit carried from the database, it means that the driver is not disobeying the speed norms. But if he goes beyond the speed limit, then a 30-second notification message is gleamed within the vehicle via buzzer and LCD to give the awareness to the driver about the disobeyed offence after that challan is initialized.

We can also use this system in challans so that traffic police can easily make challans and the challans are sent directly to the server. This system can be used in documentation system sothat the vehicle owner is not required to carry documents like pollution certificate, registration certificate, license information etc. All the information is stored in the server so that the driver can drive without any hesitation. It is useful for traffic police as well; they can directly scan the RFID tag mounted on the vehicle and check information regarding the vehicle in the presence or the absence of the owner. If any information is discarded, then the challan is generated quickly.

This system is fasteras compared to the other systems because, in this system, everything is available at one place without carrying documents or going on different websites. It is more efficient compared to other systems.

IMPLEMENTATION

*Working of Red light Jump Challans:*Traffic signals can be connected to the server using the Internet of Things (IoT). In similar way, RFID readers at stop line of lanes are also connected to the server using the same technology. The traffic signal and the RFID reader both are connected directly as well so that they can interact. When the signals turn to red, RFID readers get activated. If any vehicle crosses the stop line, the reader gets car information that may be processed at the server to generate a challan electronically. As soon as the signal turns to green, readers will be off and traffic can pass smoothly. This whole process is shown in figure 1.
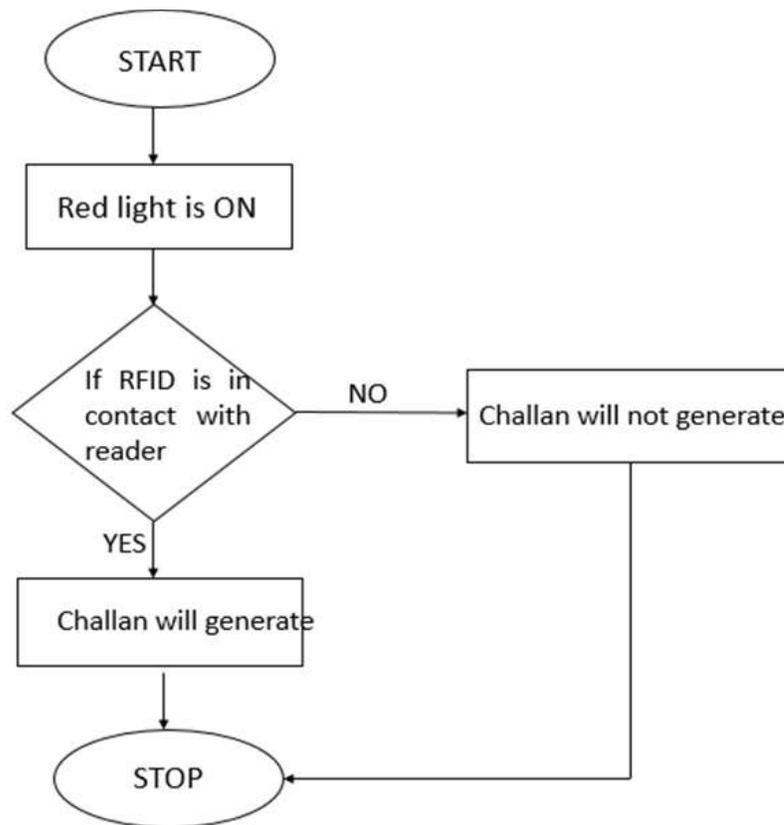

Figure 1. Flow chart for Automatic Challan System for Crossing Traffic Light

*Working of Over-speedingChallans:*An advanced system for cars can be designed where the GPS system will help to measure the speed of a car without interacting with the speedometer of the

car[6]. Various roads can be equipped with an RFID reader to read the car's RFID tag; at the end of the road, another reader will again read the card. By using distance and time, speed can be calculated. If it comes out to be higher than the allowed limit, then the system will proceed with the challan through the server. The complete process is clearly shown in figure 2.
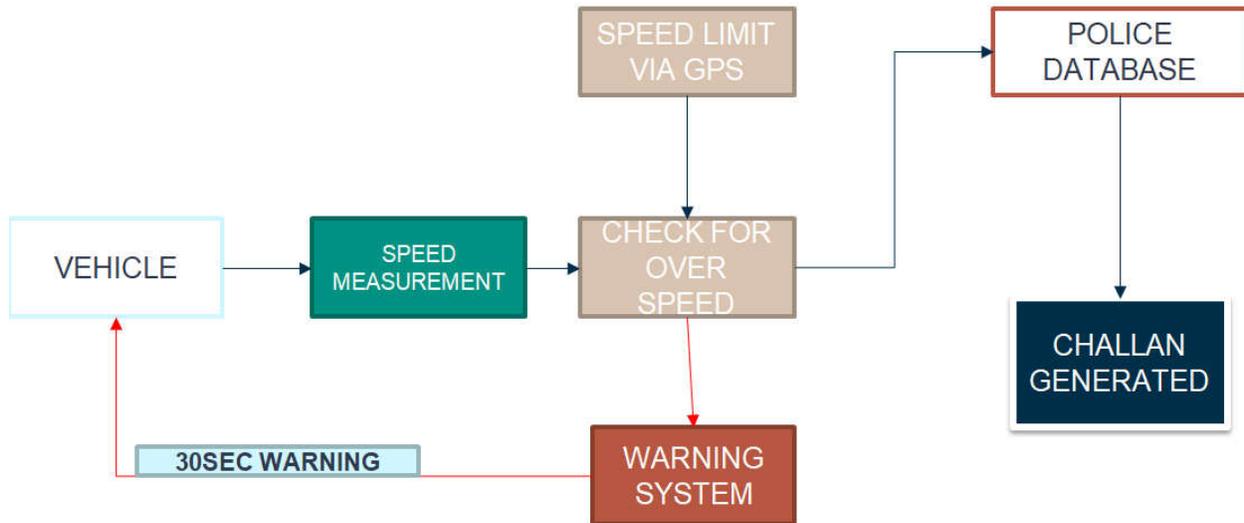
Figure 2. Block Diagram for Automatic Challan System for Over-speeding of Vehicle

ANALYSIS

The use of the smart devices in daily life increases the quality of life and also helps in solving the problems efficiently in less time that results in increasing the comfort, reducing the cost, saving the energy, providing the security as well as the safety. As a result, the brilliance and intelligibility of these all devices is developing at an exponential rate while offering much higher cost-effectiveness and simplicity with their connectivity. The interconnectivity of virtually every object is now possible through the internet, human-social networks and machine-to-machine communications.

APPLICATIONS

The rate at which more people are adapting to the automation options is high. This is relative to the fact that most of the vehicles and transport systems like paying challan at home without visiting any regional office after verifying the documents of the vehicle and its owner directly through RFID reader and automatic challan system without manual labour. This is an approach that provides users with more comfort.

There are many applications of this smart system[7, 8]:
1. This smart system may be used in every toll for the fast transactions in less time so that the vehicle does not need to stop-then-go.

2. This smart system can be used in a security system for making online transactions safe while paying challan and parking dues.
3. This system may be used in every red light so that automatic challan is generated without any manual work.
4. This system can also be used for detecting the speed of a vehicle.

CONCLUSION

By using RFID technology and many other related technologies, automation results into reducing the manual load and hence people become free from daily troubles. Through this, we can introduce smart systems and hence increase the operational efficiency, reduce the time delays, decrease the congestion as well as the pollution and make challans automatically for red light jumping and overspeeding. This paper has presented the structure of the whole transport management system with very economical wireless system.

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