

AUTOMATED TOLL COLLECTION SYSTEM USING RFID

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ABSTRACT

In this system named Automated Toll Collection System using passive Radio Frequency Identification (RFID) tag use as the manual toll collection method placed at tollgates. Time, efficiency, pollution and fuel are main priority of present day. In order to overcome the major problem of vehicle congestion and time consumption RFID technology is used. RFID reader fixed at tollgate frame reads the tag attached to windshield of vehicle. Various modules of this system are RTO admin, Toll admin, Police admin, Super admin and the general public. The role of the Super admin is to register toll centers at various locations using Username and password. These credentials are sent to the toll admin, using which he logs in into the account. Toll admin module is basically used for the calculation purpose of toll deduction based on vehicle type. The RTO registers the vehicle information and associates it with the RFID tags of general public vehicles. In-case a stolen vehicle passes through the toll collection center, it is detected and the notification is send to the Police admin module. The object detection sensor in the reader detects the approach of the incoming vehicle's tag and toll deduction takes place through e-wallet assigned to the concerned RFID tag that belongs to the owners' account. Additionally the daily toll collection information can be obtained and send to the Government for verification.

Keywords: *Toll Collection, RFID, RFID reader, RTO, RFID tag, e-wallet.*

I. INTRODUCTION

Electronic/automated toll collection systems are very popular these days. They do not require manual collection and operation of toll barriers. The need for manual toll based systems is completely reduced in this method and the tolling system works through RFID. The details about the vehicles and payment are stored in an RFID based system. The main idea behind implementing RFID based Toll Collection System is to automate the toll collection process there by reducing the long queues at toll booths, using the RFID tags installed on the vehicle. In addition to this, it can not only help in vehicle theft detection but also can track vehicles crossing the signal and over speeding vehicles. This system is used by vehicle owners and system administrator. Other general advantages for the motorists include fuel savings and reduced mobile emissions by reducing or eliminating deceleration, waiting time and acceleration.

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II. RELATED WORK

We now continue to analyze some of the systems developed. The first paper focuses the automation of toll plaza based on image processing. ANPR (Automatic Number Plate Recognition) system has been employed which uses a camera to capture the number plate of the vehicle and deducts the toll by matching it with the owner database. In the second paper, the system is based on infrared sensors. In this, the user has to get the IR transmitter from the main toll office. The transmitter will be charged by the store office and the data of the user will be stored in the microcontroller. When the car arrives at the toll plaza the user will have to mount the transmitter on the car and press a button to turn it on. It must be in the line of sight of the receiver. The receiver will confirm the data from the transmitter with the database and the amount of toll will get deducted. It uses a stepper motor for gate control. In the third paper, the system is based on the RFID technology. The controller used is PIC 18F4550 and has been connected with the system using USB. The RFID receiver senses the tag coming in its range and the amount gets deducted from the account of the owner after all the related information is checked from the database. The IR senses the vehicle motion for controlling the opening and closing of the gate. A stepper motor is used to control the gate.

III. OUR APPROACH

This project deals with the simplification of procedure followed by passengers to pay toll at toll collection booths, RFID reader fixed at tollgate frame reads the tag attached to windshield of vehicle. The object detection sensor in the reader detects the approach of the incoming vehicle's tag and toll deduction takes place through e-wallet assigned to the concerned RFID tag that belongs to the owners' account. In case a stolen vehicle passes through the toll collection center, it is detected and the notification is send to the Police admin module.

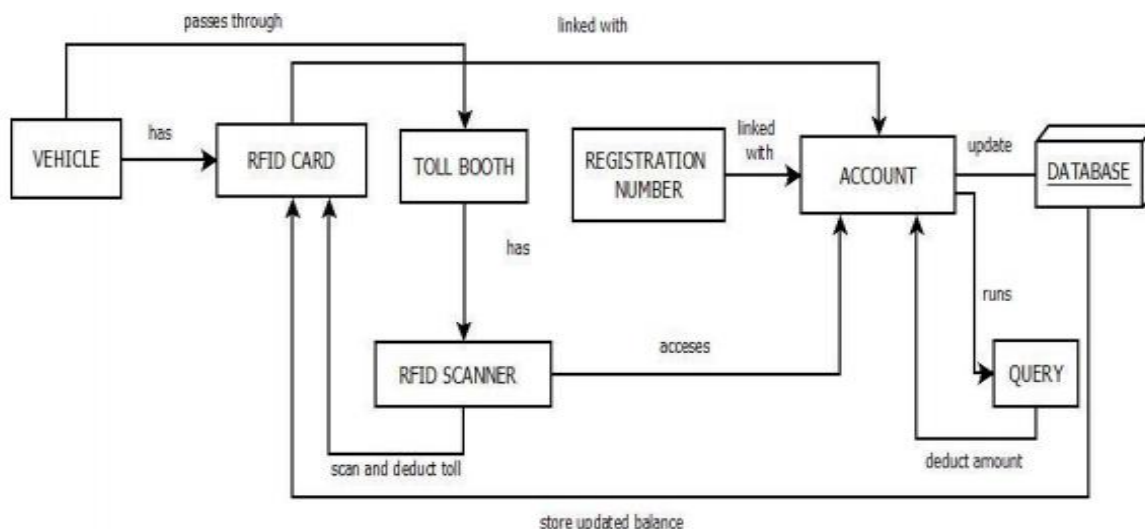


Fig. System Architecture



IV. CONCLUSION

We can reduce the prevalent problem of skipping the payment of toll at toll plazas because of automatic deduction of payment through E-Wallet. The long queues at the toll plaza and need for human intervention is reduced greatly. This system will ensure a smoother and safer journey for the passengers.

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