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## Automatic Toll Collection System Using RFID

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**ABSTRACT:** ATSRT is an Automatic Tolling System using RFID Technology is used for collecting tax automatically. In this we do the identification with the help of radio frequency. A vehicle will hold an RFID tag. This tag is nothing but unique identification number assigned. This will be assigned by RTO or traffic governing authority. In accordance with this number we will store, all basic information as well as the amount he has paid in advance for the TOLL collection. Reader will be strategically passed at toll collection centre. Whenever the vehicle passes the toll booth, the tax amount will be deducted from his prepaid balance. New balance will be updated. In case if one has insufficient balance, he will have to pay the tax in cash. As vehicles don't have to stop in a queue, this translates to reduced Traffic congestion at toll plazas and helps in lower fuel consumption. This is very important advantage of this system.

**KEYWORDS:** RFID Scanner, GSM, RFID Cards, Toll Collection.

### I. INTRODUCTION

The automated toll collection system using passive Radio Frequency Identification (RFID) tag emerges as a convincing solution to the manual toll collection method employed at tollgates. Time and efficiency are a matter of priority of present day. In order to overcome the major issues of vehicle congestion and time consumption RFID technology is used. With the movement of inter-State vehicles and goods, there is rise in the number of toll roads and bridges which overall increases the load on highway roads. The proper collection of toll fees can generate a huge quantum of funds for the maintenance of aging bridges and the large road network. We need to improve the toll tax collection system and to reduce the traffic at toll tax depots we will develop a system called No Queue Toll Tax Collection System. Therefore, the new technique is urgently required to reform the problem of congestions.

Automated toll collection system is one of the methods to solve the above conditions. The automated system is composed of several subsystems. The RFID technology, computer database, power supply, microcontroller, motor and inferred device are included. Automated system can bring the several sectors for toll gates as saving time and reducing the human workers. The RFID tag and RFID reader are contained in RFID technology. RFID means Radio Frequency Identification that consists of the tags. RFID reader is an interrogator. It is placed at the toll gate on every single row where vehicles are passed. The reader contains an RF module, which acts as both transmitter and receiver of radio frequency signals. The reader generates the signal to receive the data from tag. The received signals send to the computer system which contains Graphical User Interface (GUI) and the database of all users. The ID number from the tag checks with the recorded database and deduces the toll tax. The computer and microcontroller are connected with USB cable. The microcontroller will display the amount of deposits on LCD and the gate will open. The IR sensor senses the vehicle motion for closing gate automatically.

### II. RELATED WORK

This project deals with the simplification of procedure followed by passengers to pay toll at toll collection booths, like making it automated and vehicle theft detection. All these activities are carried out using single smart card (RFID tag), thus saving the efforts of carrying money and records manually. Automatic Toll Collection: The RFID Readers mounted at toll booth will read the prepaid RFID tags fixed on vehicles' windshield and automatically respective amount will be deducted from his/her account.

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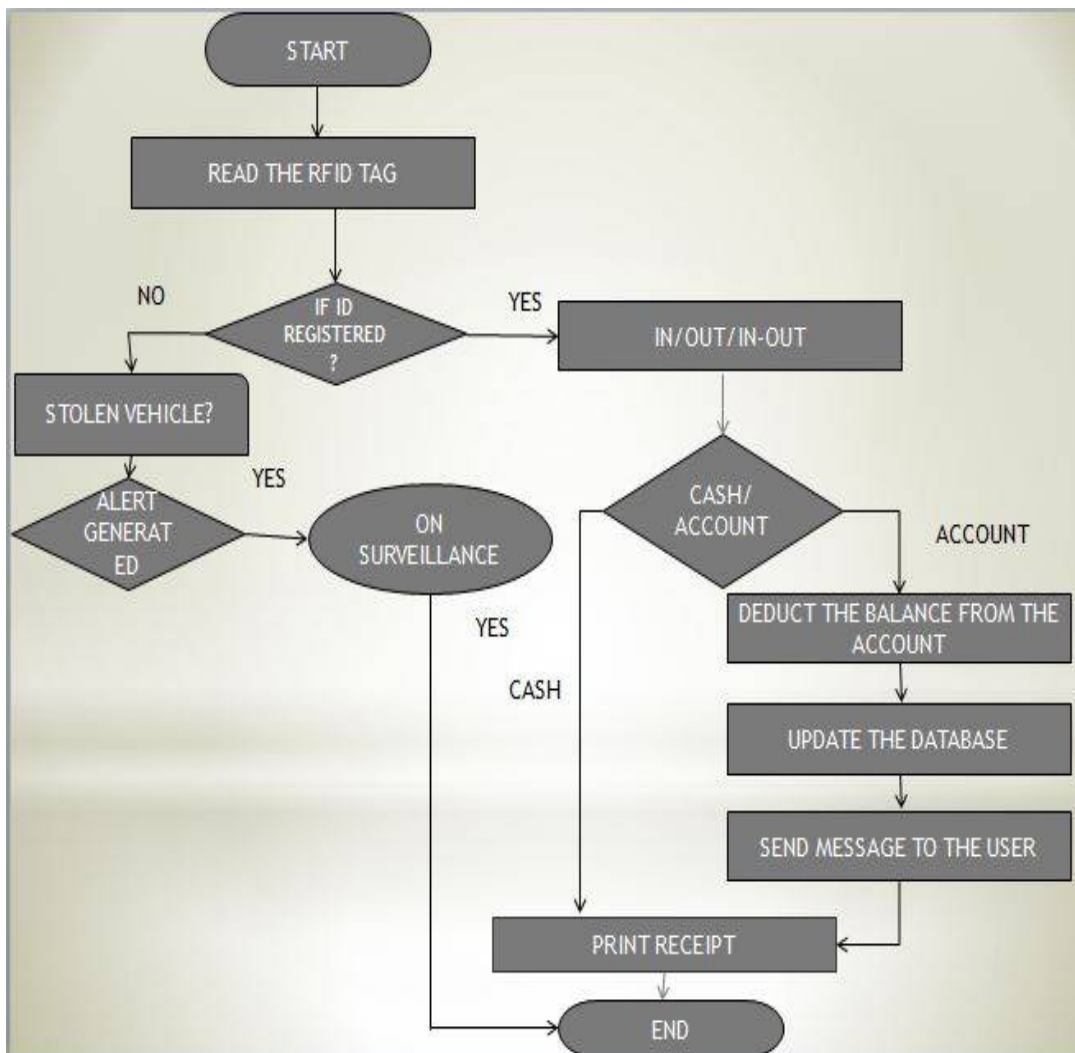
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Vehicle Theft Detection: When some unregistered vehicle passes the toll gate, then it will highlight that the vehicle is unregistered. He/she will pay the taxes without knowing that the car's status is being notified to the next toll booth.

### III. PROPOSED ALGORITHM

Whenever any person buys a vehicle, one first needs to get his or her vehicle registered at the RTO office. RTO officials will not only assign a number plate to it but also will give a RFID enabled smart card or a tag. This card will have a unique ID feasible to use with that vehicle only. They will also create an account for the use of that particular smart card and maintain transaction history in database. User needs to deposit some minimum amount to this account. Every time a registered vehicle approaches the toll booth, first the Infrared sensors will detect the presence of the vehicle. It will in turn activate the RFID circuit to read the RFID enable smart card fixed on the windscreen of the vehicle. Transaction will begin, depending upon the balance available toll will be deducted directly or the vehicle will be directed towards another lane to pay tax manually. The software further updates the details in the centralized database server. It also triggers mechanism to generate the bill and will be sent to user as a text message

### IV. METHODOLOGY



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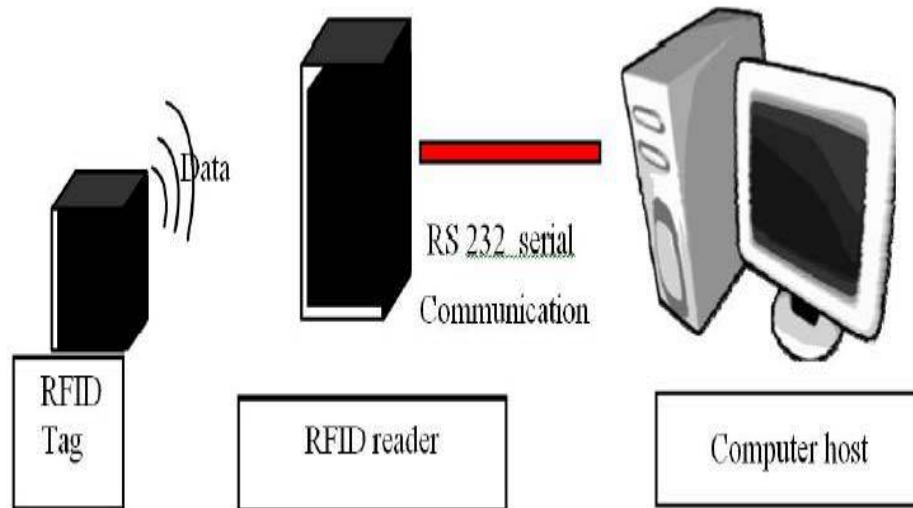


fig.(1):Implementation

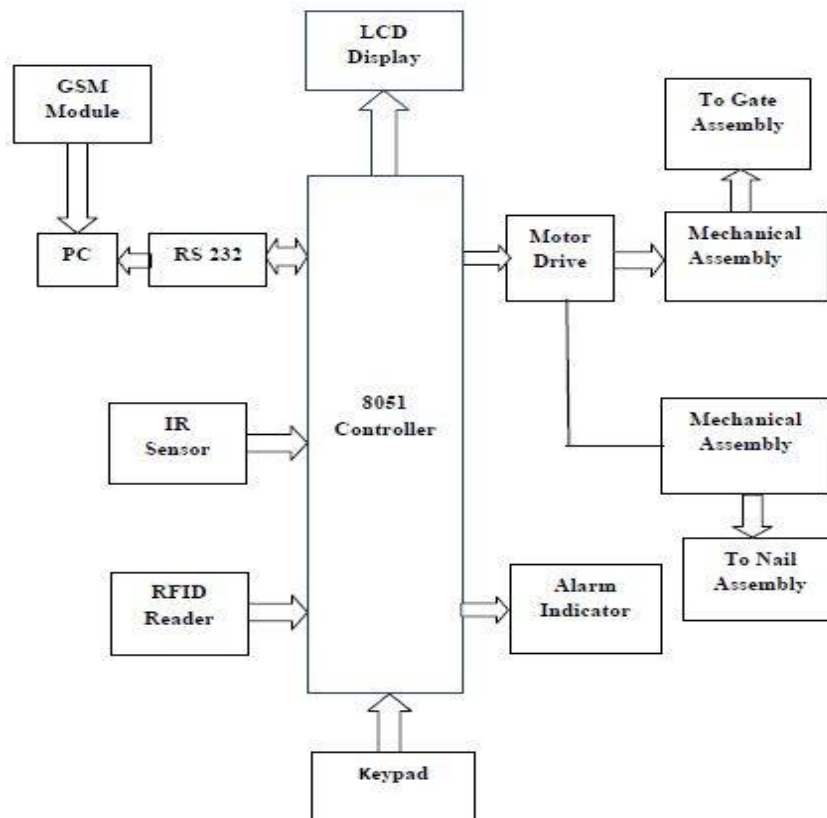


fig.(2):Working of the System



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## V. ADVANTAGES AND DISADVANTAGES

Advantages:

1. Reduces the man power.
2. Enables very specific detection of vehicles.
3. Simultaneous multiple detection of vehicles are possible using RFID.
4. Saves time and money.
5. Minimizes work stress.

Disadvantages:

1. Low frequency results in lower maximum data rate, although it is fast enough to allow multiple transmissions to increase reliability.
2. Moderate difficulty in duplicating tags.

## VI. CONCLUSION AND FUTURE WORK

There were many difficulties in the previous system. Some of the difficulties like manual entry and some discrepancies were removed using this project. This method not only saves the driver's time but also saves the hectic schedule of the toll collection booth. By performing this project, one can learn many concepts of digital electronic system. We have also learnt the concepts of VB.Net and other software applications.

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## BIOGRAPHY

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