



“AUTOMATED TOLL COLLECTION SYSTEM USING RFID”.

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Abstract : ATCS is an Automated Toll Collection System 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 placed at toll collection center. Whenever the vehicle passes the toll collection center, the tax amount will be deducted from his prepaid balance. New balance will be updated. In case if one has insufficient balance, his updated balance will be negative one. To tackle this problem, we are alarming a sound, which will alert the authority that this vehicle doesn't have sufficient balance and that particular vehicle can be trapped. As vehicles don't have to stop in a queue, it assures time saving, fuel conservation and also contributing in saving of money. Automatic Toll Collection systems have really helped a lot in reducing the heavy congestion caused in the metropolitan cities of today. It is one of the easiest methods used to organize the heavy flow of traffic.

IndexTerms– RFID,JVM, CGI , RTO, CLI.

I. INTRODUCTION

As we all know that transportation is the backbone of any country's economy. Improvement in transportation systems result into the good lifestyle in which we achieve extraordinary freedom for movement, immense trade in manufactured goods and services, as well as higher rate of employment levels and social mobility. In fact, the economic condition of a nation has been closely related to efficient ways of transportation. Increasing number of vehicles on the road, result into number of problems such as congestion, accident rate, air pollution and many other . All economic activities for different tasks use different methods of transportation. For this reason, increasing transportation is an immediate impact on productivity of nation and the economy. Reducing the cost of transporting resource at production sites and transport completed goods to markets is one of the important key factors in economic competition. Automatic toll collection is a technology allows the automated electronic collection of toll costs. As it is studied by researchers and also applied in various expressways, bridges, and tunnels require such a process of Automatic Toll Plaza. ATP is capable of determining if the vehicle is registered or not, and then informing the management center about to process violations, debits, and participating accounts .The most excellent advantage of this ATP system is that it is capable of eliminate congestion in toll plaza, especially during those seasons when traffic seems to be higher than normal.

II. LITERATURE REVIEW

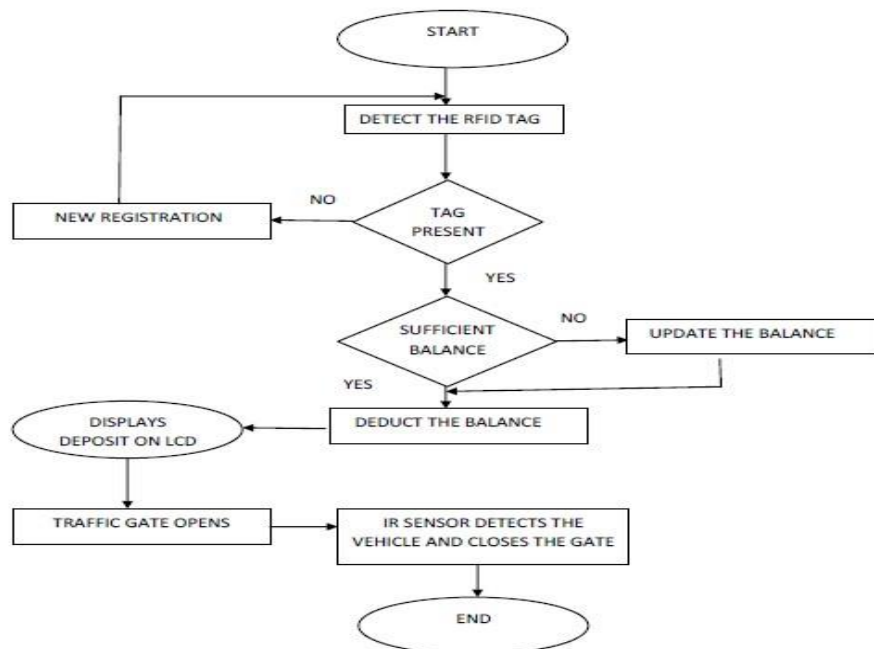
III. Asif Ali Laghari et.al discusses another system which solve the problem of waiting period and payment issues in the conventional manual toll collection system. This proposes a system which contains transponder, Antenna, Traffic Controller System & Central Server. Transponder is the RFID tag which houses a unique identification number. The Traffic Controller System makes the system different from others. This system manages the distribution of vehicles incoming across a set of parallel toll gates. It uses a Lane Allocation Algorithm. This algorithm allocates the cars approaching the toll gate among the set of the toll gates. The system also employs traffic speed controller. Once the RFID tag comes into the range of the Toll Plaza, the ECU (Electronic Computer Unit) is directed to reduce the speed of the vehicle. The problem with the system is that, once the algorithm fails the entire system fails and leads to huge traffic overhead.

IV. Sachin Bhosale et.al discuss about RFID technology for automating the process of tollbooth system. RFID stands for Radio Frequency Identification. The components of the RFID System basically include RFID transmitter, a RFID receiver and some processing machine. The paper then goes on to discuss about the types of RFID tags. Types of RFID tags include Active Tags and Passive Tags. An active RFID tag is equipped with a battery. It can be used as a source of power for the tag's circuitry. It has better identification range and larger capacity. Active tag is able to send a strong signal to the reader because of the presence of battery. The major advantages of an active RFID tag are that they allow a read range of about one hundred feet and hence providing a high sensing range. It allows other sensors that can use electricity for power.

V. Abhishek Sharma et.al. is also based on RFID. In addition to that it uses load sensing technology. It first discusses about the operation of RFID. As discussed in the previous paper, the proposed RFID system uses tags that are mounted on the windshields of vehicles, through which information on the tags are read by RFID readers. In each automated toll booth, there will be a RFID sensor and a load sensor. Control booth will house a computer and an operator. Then discussed each operation step by step. First step is reading the card. RFID works in radio frequency. When a vehicle with TAG approaches a toll booth the RFID sensor detects it. Then it sends the detected tag id to the server through MAX232 serial communication.

VI. RESEARCH METHODOLOGY

3.1 SYSTEM ARCHITECTURE

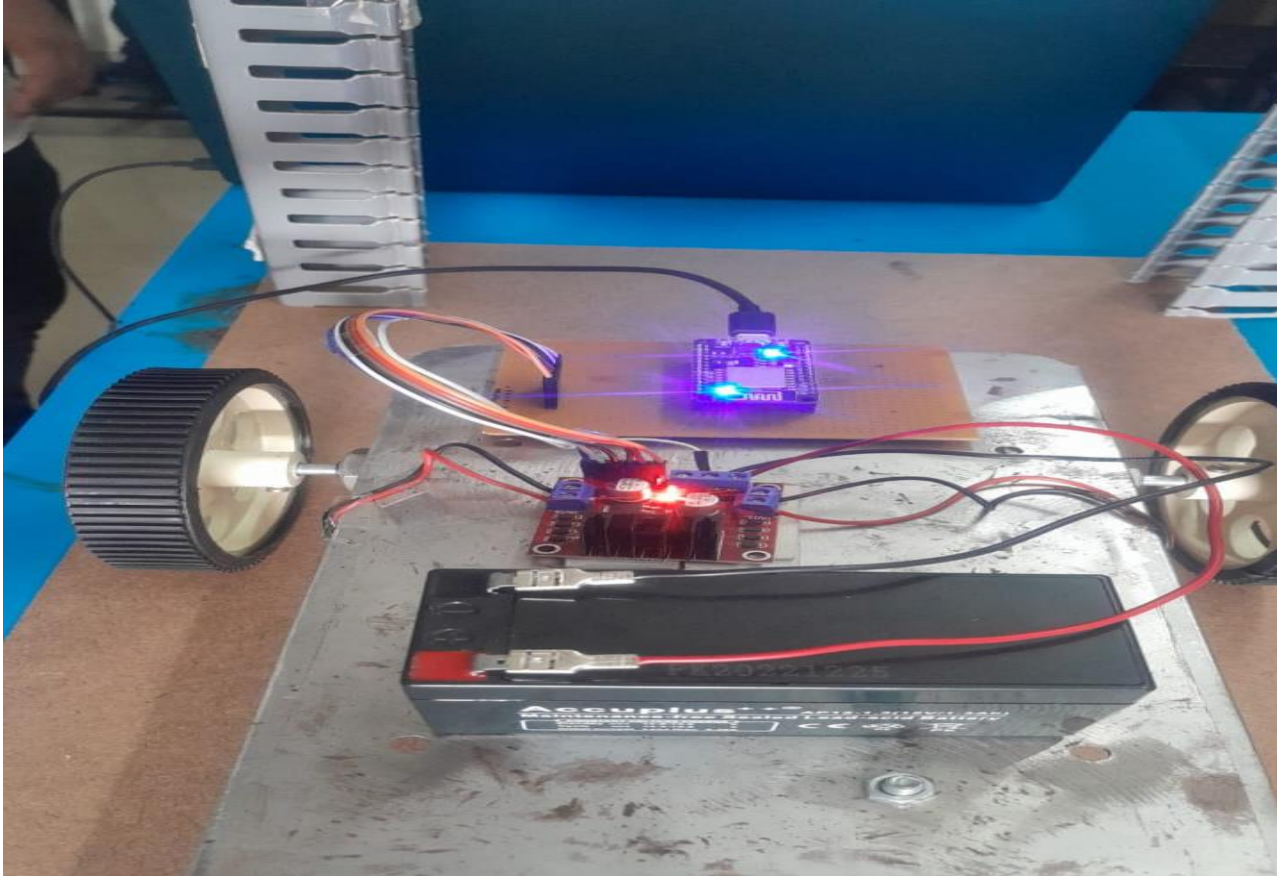


3.2 METHODOLOGY

Whenever any person buys a vehicle, first he/she need to do her vehicle registered at the RTO office. RTO people will assign a number plate to it along with it they will give a RFID enabled tag. This card will have a unique ID feasible to use with that vehicle only. They will also create an account for that particular smart card and maintain transaction history in database. Owner of the vehicle 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 which in turn activates 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. On the other hand, whenever any vehicle owner registers a complaint at the RTO office regarding theft of the vehicle respective entry is made in the database. Now any vehicle arriving at toll booth with same ID as already present in stolen vehicle category will be easily identified as the ID assigned with it is unique. All the toll plazas will be connected to each other along with the centralized server in the form of LAN. Updates of any sort of transaction will be immediately updated to local database and centralized server.

VII. RESULTS

4.1 HARDWARE IMPLEMENTATION



VIII. Conclusion

The Electronic Toll Collection system in expressway based on RFID, a design scheme was put forward. It is low cost, high security, far communication and efficiency, etc. It not only improves the passage ability of expressway but also improves the technology level of charge. Electronic toll collection system using RFID is an effective measure to reduce management costs and fees, at the same time, greatly reduce noise and pollutant emission of toll station. In the design of the proposed Electronic toll collection (ETC) system, real time toll collection and anti-theft solution system have been designed. This reduces the manual labour and delays that often occur on roads. This system of collecting tolls is eco friendly and also results in increased toll lane capacity. Also an anti-theft solution system module which prevents passing of any defaulter vehicle is implemented, thus assuring security on the roadways

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