

**INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH
TECHNOLOGY****“ACTIVE RFID BASED SYSTEM OF ELECTRONIC TOLL COLLECTION (ETC)
FOR TRANSPORTATIONS”****Ms. Vaishali Pande¹, Ms. Nivedita Hasti², Ms. Anjali Rahate³, Mr. Kunal Tagade⁴, Mr. Anup
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ABSTRACT

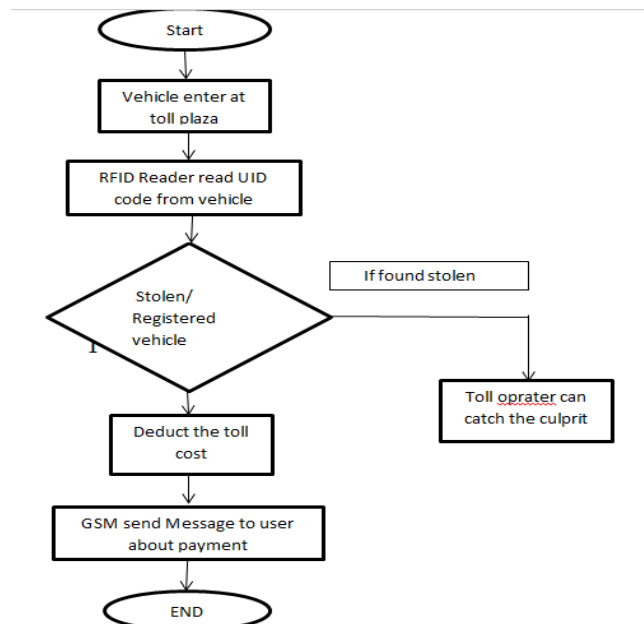
In this system, we have used RFID concept to transmit and receive information of vehicle instantly without any human interference the toll tax amount registered with a vehicle at the time of registration, also some information of vehicle will save at the time of registration. In this system microcontroller AT Mega 328 is used as a main controller, when any vehicle arrives to the toll plaza, RFID tag send unique ID code to toll plaza. RFID receiver take this code and send towards microcontroller, then microcontroller check in database the information of vehicle if vehicle found legal it can pass the toll plaza, and if, vehicle found illegal such as stolen vehicle or unregistered vehicle then toll gate will close and vehicle will be blocked.

Keywords: Active RFID, authentication, automatic transmission, GSM, multiple tag reader.**I. INTRODUCTION**

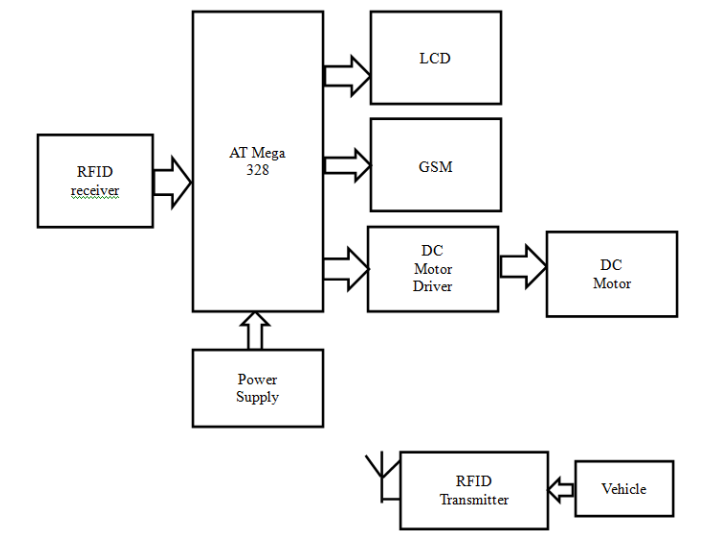
Active RFID technology is used for transmitting the unique ID code to receiver Electronic Toll Collection Technology is very useful and advance technology. Security of barcode technology is less. In the RFID tag more information is store. The line of sight is not required for communication through radio wave. In previous system the toll plaza is under manually operated so, congestion, wastage of time and wastage of fuel these are the problems created in toll plaza is under manually operated so, this process is speed up at toll plaza. We will make a device i.e. RFID based automated electronics toll collection system. In this system accuracy is high for the toll plaza and vehicle owner.

In active RFID technology system fuel loss is avoid, time is saving and reduce, toll payment is easy, toll gate entry for illegal vehicle is reduce. In addition to this it also helps in vehicle theft detection. Suppose, if any vehicle has stolen and the vehicle owner has given the report of stolen vehicle to the police station. In that condition, the police officer have to just type the message of stolen vehicle number and send to the all toll plaza. So, whenever that stolen vehicle arrive to the toll plaza the toll gate will automatically close for that vehicle and the toll observer can easily catch that culprit person.

II. FLOWCHART OF PROPOSED SYSTEM



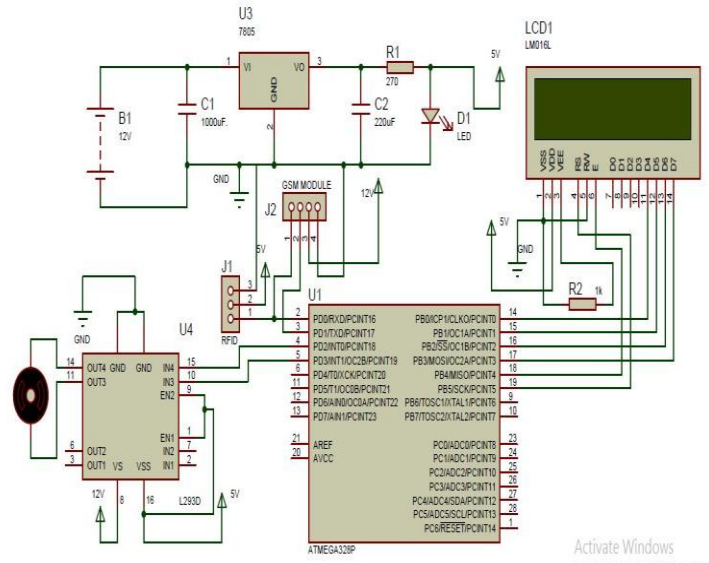
III. BLOCK DIAGRAM



1.1 Block diagram of proposed system

In this system we focus on automatic toll collection system. Every vehicle will be attached with a RFID tag which contains a unique ID of user. The RFID tag continuously transmits the information in each 3 seconds when vehicle reaches at the toll booth. Then the RFID reader read the given signal. And pass over to the controlling device. i.e. microcontroller then by the programming microcontroller 328 works, it first check the authority of the vehicle or user if the vehicle is authorized then specific tax for particular vehicle is automatically deducted from moving vehicle, which is pass through the toll plaza. Here it is assume that the owner maintain a ID for deduction of money.

The Microcontroller stored all the required information of the user in database and, then after the deduction of money a user receives an SMS on his/her mobile about the detail of payment then also toll gate will be open by using active RFID. We reduced the time consumption at toll plaza also reduced the vehicle congestion at toll plaza.



1.2 Circuit diagram

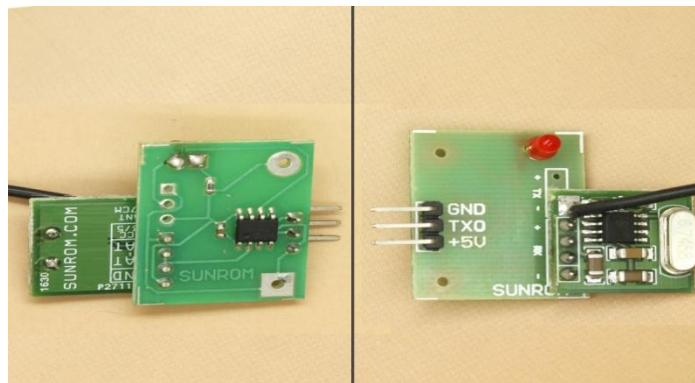
IV. HARDWARE COMPONENT

1) RFID Tag:

RFID stand for Radio frequency identification. The RFID tag is mainly divided into two type, active tag and passive tag. Active tag comes with internal power supply and passive tag required UID (unique identification) code to RFID reader when they are comes in contact with each other.

2) RFID Reader:

A radio frequency identification reader (RFID reader) is a device used to gather information form an RFID tag. The concept of radio ave are used to transfer data form the RFID tag to RFID reader can read multiple tag at once.



1.3 Active RFID Receiver

3) GSM :

In this system we used SIM 900 GSM module it is used to send the message of amount deduction on the registered mobile number, when the vehicle crosses the toll plaza.

4) MICROCONTROLLER:

It is the most important component in over system. In this system we used AT Mega 328 Microcontroller. It is single chip Microcontroller created by Atmel in the mega AVR family the power consumption of this microcontroller is very low and Arduino Uno is used as development board for this controller by using we can easily dump a program in Microcontroller.

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5) MOTOR DRIVER:

In this system motor driver is used to open and close the toll gate, after the authentication of the vehicle. We used L293D motor driver IC in this system L293d can drive small and quit big motor as well. Motor driver are basically a current amplifier which takes a low current signal from the microcontroller and gives out a proportionally higher current signal. This can control and drive the DC motor.

Software used:

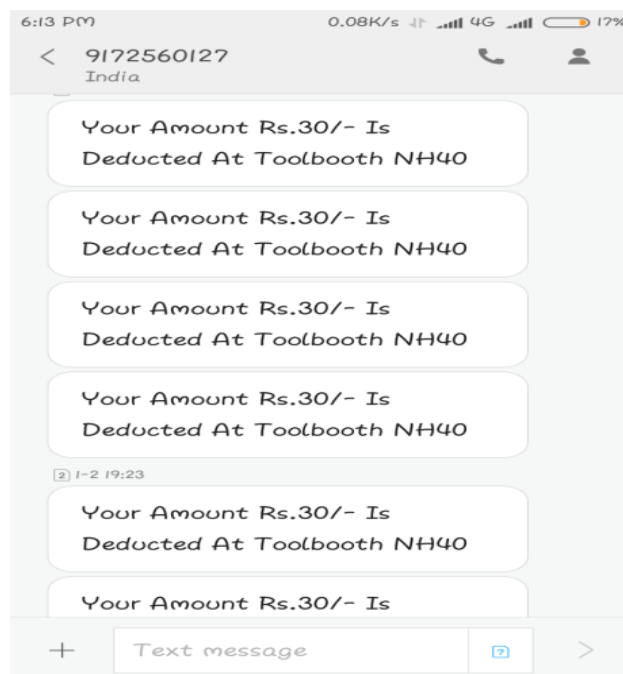
1) PCB Artist:

PCB Artist is just one of many PCB layout software tools available to use, but an understanding of one layout tool can easily transfer to any PCB design tool.

2) Arduino IDE software

The Arudino software is a programming tool. The program written using Arduino software are called sketches. We used Arduino IDE software has a version 1.6.10. it is connect to the arduino.

V. RESULT



VI. ADVANTAGES

- 1) Communication through Radio wave so, line of sight is not required.
- 2) RFID reader read multiple tag signals at once.
- 3) Every tag has unique identity.

Applications:

- 1) Automatic collection of vehicle toll tax.
- 2) This system also used in advanced vehicle parking.

VII. CONCLUSION

After implementing this system we easily detect the vehicle identity. By utilizing this system in toll plaza it will reduced the complete processing time by few second which is very important as well as help to reduce vehicle congestion at toll plaza.

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