RFID based automated toll tax collection using Arduino.

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Abstract*:–** ***ATCS is known as the Automated Toll Tax Collection System. It is the new technology for collecting the toll in a faster way we have come up with a concept of RFID based automated toll plaza system using Arduino. RFID stands for Radio Frequency Identification. Each card has a unique id. The RFID card reader attached to the toll plaza gate read the cards and transfer the unique id to Arduino Atmega 328. The processor works and deducts fixed money from the card .if the card id is valid then the gate will open using DC motor and show the message on the LED display or card is not valid then we can collect the money manually on the toll the booth.

Keywords*:- *RFID tags, RFID reader, Database, Tollbooth, Arduino, Vehicle GSM Modems, traffic jams

I. INTRODUCTION

Lately, radio recurrence ID innovation has moved from a lack of clarity into standard applications that help speed the treatment of fabricated products and materials.RFID enables identification from a distance, and unlike earlier bar-code technology (see the sidebar), it does so without requiring a line of sight In day to day life human being can be used vehicle can traveling the long-distance.when the human can travel then they pay the amount in toll booth manually.

Nowadays there is a huge technology that can come we can pay the money in toll booth without using the manpower. The automatic toll tax collection system can be used to pay toll amount in toll plaza.

- **Toll tax collection system:-**

Using the toll tax collection system then we use the software and hardware.using hardware component, for example, RFID reader, RFID tag, Arduino, gsm modem, sensor, LED display, etc. Using Arduino we can connect the hardware components. The vehicle is passed on toll plaza then the RFID reader can read the tag of the vehicle and automatically pay the amount in toll plaza without

using manpower. We have made automation of toll plaza using a combination of microcontroller, RFID. The main purpose of this system is it automatically identifies.

➢ **Rfid Reader:-**

RFID is nothing but the radio frequency identification which is electromagnetic filed reading the tag of the vehicle and automatically pay the amount of toll plaza

Fig 1. RFID Reader

➢ **RFID Tag**

An RFID tag is a tiny radio transponder, transmitter, transceiver. There are three types of the RFID tag

1. Passive Tag
2. Active tag
3. Semi Passive Tag

Fig 2 RFID Tag

➢ **Arduino Uno:-**

All the hardware component can connect through the Arduino Uno

Fig 3 Arduino Uno

II. LITERATURE SURVEY

In a research product, tolling practice and technologies are presented. likely development and enhancement are reviewed, along with the potential to other intelligent transportation systems.

2016 3rd MEC International Conference on Big Data and Smart City (ICBDSC) [1]
This paper study to show how the system can work automatically using RFID.
2011 IEEE Conference on Sustainable Utilization and Development in Engineering and Technology (STUDENT) in these paper studies to show how can traffic can manage[2].
2018 IEEE 10th International Conference on Humanoid, Nanotechnology, Information Technology, Communication, and Control, Environment and Management (HNICEM) [3] these paper study to show the how the toll plaza is system is work using e-management
2012 IEEE RFID Based Toll Deduction System, I.J. Information Technology and Computer Science, this paper studies to show

the application of automatic toll tax collection using RFID [4].

III. SYSTEM ARCHITECTURE

The working is as follows:

1. Detect the vehicle.
2. Reads the tag fixed in the vehicle
3. As the vehicle passes through the toll, the tag gets detected by the RFID reader.
4. As the tag is detected the amount from the user account is deducted and a notification message of amount deduction and successful/ unsuccessful message is sent to the user.
5. If the user has an insufficient amount in his/her account, then the user has to pay the penalty charges.
6. The user can also add money from bank/Paytm account

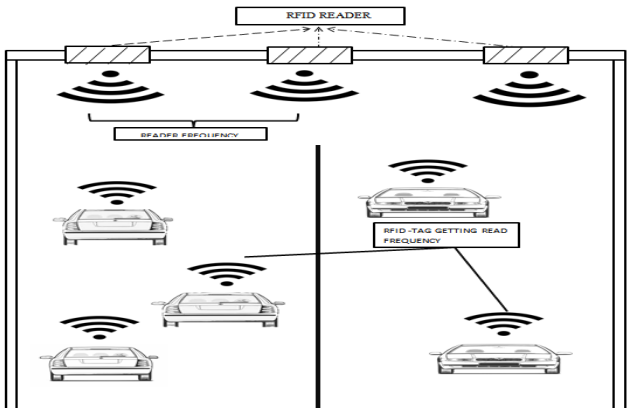

Fig 4

IV. PROPOSED METHODOLOGY

Detection of vehicle:-

When the vehicle is passed through toll booth the RFID reader reads the tag of the vehicle and automatically pays the amount from the toll plaza

Display of toll:-

When we use the RFID Reader amount will automatically pay to the toll plaza and display the remaining amount on the screen.

Payment through RFID card:-

Successfully pay the amount using an RFID card. Which will show the unique id?

- **MODULES DEVELOPED:**

a) Registration module:

This is the first step for the usage of taxo tax. The registration field consists of a total of 12 fields. Some of the fields are as follows:

b) Login Module:

It consists of 2 fields i.e. Email-id and password. If the registration is done then only it will accept the email-id and the password; else it will give an error ‘incorrect email-id /password’.

c) Admin Login Module:

It consists of 2 fields 'admin id and password’. The admin has a track to all the data about the user, toll boots, transactions, etc.

Admin has access to the user account i.e he/she can block the tag/card in case of loss.

d) User History Module:

In the user history, the user can track/view the payment/transaction history.

It consists of 5 fields. The fields are as follows:

-Id

-Date

-Vehicle Type

-License Plate no

-Charges

V. FUTURE SCOPE

In the future, we are planning of making this system more accurate. We also will be implementing the facility of the post charging the user's accounts. Hence, the toll tax will directly link the users toll account with his bank account also in future we are looking to add a feature that will allow the government can to pass through without collecting their tax.and also one of the features is adding if RFID tag is not working then we can scan the barcode and do the transaction online.

VI.CONCLUSION

The conclusion is to implement a modern system of toll tax collection. The automatic toll plaza system was used and a new technique. The brain of the system is RFID. A reliable RFID technique was used for authentication and authorization of Vehicles. RFID technology can provide new capabilities as well as an efficient method to collect, manage, disseminate, store and analyze information It not only eliminates manual data entry but also inspires new automation solutions. By making automatic toll collection we can have the best solution over money loss at toll plaza by reducing manpower.

VIII. REFERENCES

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