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SMART HIGHWAY ELECTRONIC TOLL COLLECTION USING RFID TECHNOLOGY

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Abstract **:** *Electronic Toll Collection is a generally mature technology that allows for electronic payment of highway tolls. It takes advantage of vehicle-to-roadside communication technologies to perform an electronic monetary transaction between a vehicle passing through a toll station and the toll agency. This system is implemented using the innovative technology of Radio Frequency Identification (RFID).*

Radio-frequency identification (RFID) is a technology that uses communication via electromagnetic waves to exchange data between a terminal and an electronic tag attached to an object, for the purpose of identification and tracking. Each vehicle will be provided with an RFID tag. This tag stores the unique ID of the vehicle and related information. When interrogated by a reader, it responds with that data over a radio frequency link. The readers are fixed in the toll gates. So when the vehicle comes near the reader, the data from the tags can be easily read by the readers. This data is passed to the computer and thus the cash can be deducted from the user's account.

Keywords: *RFID, Unique ID, Toll Gates, Electronic Tag*

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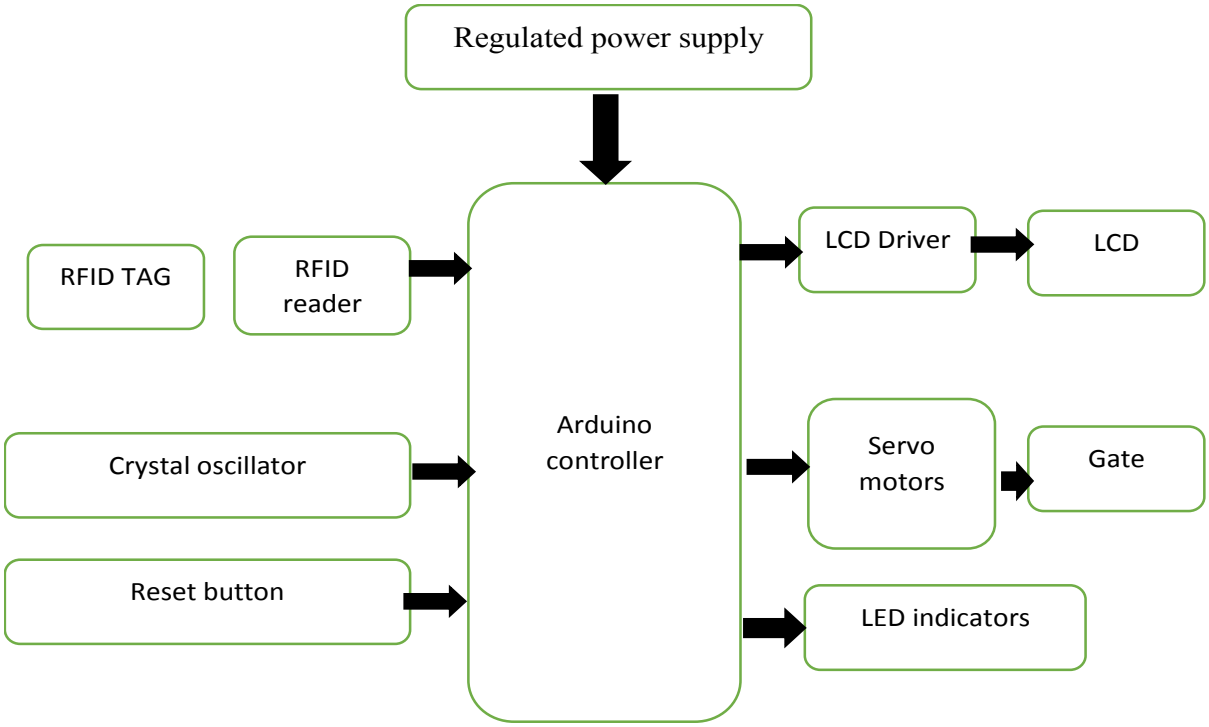
1. INTRODUCTION

Now a day's traffic problem is a very severe problem in our country. In Bangladesh, every day we have to face traffic jam for several hours which is very annoying at the same time creating a huge trouble in our daily life. Traffic jam mainly causes for reckless driving and also for the rash of the vehicles in the road. For the reduction of traffic problem government has made many bridges, fly over's and bypass roads. People have to give toll when they pass these by any vehicle. Unfortunately, the toll collection system is manual in our country which takes many times to pass the vehicles and creating traffic jam.

Here we introducing Electronic toll collection system using RFID technology which will be an automatic system, will not stop the vehicles as well as this system will help to reduce the traffic jam.

Here, the payment will be taken from the bank account of the vehicle owner and he will receive a message from the server that the toll payment has been taken. In addition, our system will also help to solve the traffic severe crashes, which is mainly caused by over speeding as here we have used speed breaker to slow down the speed of the vehicles when RFID tag will read the information of the vehicles. The project is used to provide an efficient solution for automatic toll gate control and toll collection for high ways using RFID tag. The project makes use of a atmega328p microcontroller, which acts as a central controlling unit. This module is capable of communicating with the input and the output modules. The user initially has to deposit money in the RFID tag. When RFID reader reads the tag values and money is deducted from the RFID tag. As and when the amount is deducted, the gate opens which is done by the servo motor used for closing and opening of toll gates. LCD is used to display the status of gate and the transaction details. The Arduino Microcontroller is programmed using Embedded C language.

2.BLOCK DIAGRAM

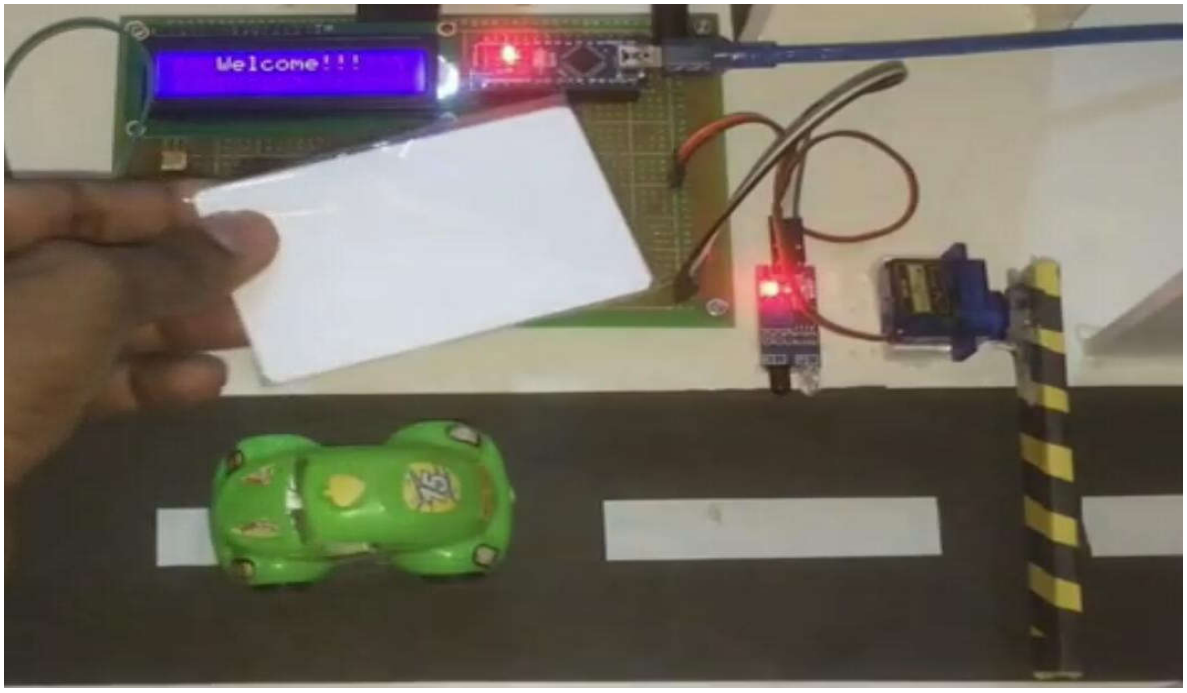


WORKING

In our project, we have a vehicle equipped with RFID tag and computer connected to Transceiver positioned at the Toll station. Whenever the vehicle enters into the coverage area of transceiver, it locates the tag and decodes the code assigned to that particular tag. After receiving the code, it is forwarded to the computer situated at the Toll station. The computer then recognizes the code and automatically access the database and if the vehicle has its valid prepaid account at the toll station, the appropriate toll is deducted from that account and the gate is opened to allow the vehicle to pass. And if the vehicle doesn't have a valid prepaid account or it is not a daily traveller, it will have to pass through a manual check post which will be in another lane.

By using the database we can avoid necessity to transmit entire data from tag thus enabling us to use tag with very less memory requirement i.e. we store only 4 or 6 digit code number in the Tag. And this 4 or 6 digit code is related to the database which is related to the database which is present on the computer. Each Tag has different code number. It also reduces error probability and saves processing time.

3. RESULT



4. CONCLUSION

Times are changing and even this Manual Technique for Taxation at toll station has to change and seeing a change in mind set of every individual this technology would also be taken whole heartedly. And we would see that paying Toll at the Toll station won't be that time consuming and much accurate and preferred across every nook and corner of the globe wherever there would be a toll station. And as described above about the merits of this Toll station we don't think that its not that far enough when we would see this technology being used in India and in terms benefiting the whole society as well as the company whose is involved in Toll taxation.

RFID is a powerful technology, and it is likely to see world-wide deployment within the coining years. Continuous technological advancements of RFID have resulted in reduced cost of installation and maintenance of devices across different market segments.

Comparing advantages and limitations of our system we can conclude that our system is beneficial for daily travellers and Toll station authorities to lessen the burden and finally, while RFID may scowl to be a fairly simple and innocuous technology on the surface, a wide range of issues and choices need to be explored and resolved for its successful, wide-scale deployment. We are seeing great promise and signs that the RFID and future upcoming sensor network technologies will help to change the way we think about our manufacturing processes and the interactions with the people and customers.

REFERENCES

[1] Sachin Bhosale,Dnyaneshwar Natha Wavhal. "Automated Toll Plaza System using RFID" USETR, Vol 2,Issue 1, Jan 2013.

[2] Janani SP, Meena 5, Automatised Toll Gate System Using Passive RFID and GSM Technology, Vol. 5. Issue ECIA2012-3 Journal of Computer Applications, February 10,2012

[3] Asif Ali Laghari, M. Sulleman Memon and Agha Sheraz Pathan, "RFID Based Toll Deduction System,"I.J. Information Technology and Computer Science, 2012, 4, 40-46

[4] Aniruddha Kurnawat, Kshitija Chandrarnore, "Automation Toll Collection System Using RFID", Vol. 2, Issue 2, April-June 2013

[5] Asif Ali Laghari, I I.Sulleman Memon, Agha Sheraz Pathan, "RFID Based Toll Deduction System", I.J. Information Technology and Computer Science, April, 2012

[6] Janani S P, Meena S, "Automatised Toll Gate System Using Passive RFID and GSM Technology", Journal of Computer Applications, Vol. 5, Issue 12-3, February 10, 2014

[7] Pranoti salunke, Poonam Mall e, Kirti Datir, Jayshree Daluke, "Automated Toll Collection System Using RFID" IOSR Journal of Computer Engineering (IOSR-JCE), Vol 9 Issue 2, Feb 2013