RFID based Automated Toll Plaza System

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Abstract: The robotized toll accumulation framework utilizing latent Radio Frequency Identification (RFID) tag rises as a persuading answer for the manual toll gathering strategy utilized at tollgates. Time and proficiency are a matter of need of present day. Keeping in mind the end goal to conquer the significant issues of vehicle clog and time utilization RFID innovation is utilized. RFID peruser altered at tollgate outline (or even a hand held peruser at manual path, in the event that RFID labeled vehicle enters manual toll paying path) peruses the label connected to windshield of vehicle. The item identification sensor in the peruser identifies the methodology of the approaching vehicle's tag and toll derivation happens through a prepaid card relegated to the concerned RFID tag that has a place with the proprietors' record. This makes tollgate exchange more advantageous for people in general use..

Keywords— ATCS, RFID Reader, RFID Tag, Toll Collection, prepaid account.

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I. INTRODUCTION

The principle thought behind actualizing RFID BASED TOLL COLLECTION SYSTEM is to robotize the toll gathering prepare their by lessening the long lines at toll stalls utilizing the RFID labels introduced on the vehicle. Notwithstanding this, it can help in vehicle robbery recognition as well as can track vehicles traverse speeding vehicles. This framework is utilized by vehicle proprietors, framework manager. Other general points of interest for the drivers incorporate fuel reserve funds and diminished portable emanations by decreasing or killing deceleration, holding up time and increasing speed.

The RFID tag and RFID peruser are contained in RFID innovation. RFID implies Radio Frequency Identification that comprises of the labels which can be either dynamic or aloof tag. Inactive tag don't have own energy supply, much less expensive to fabricate and little loop reception apparatus is utilized. Then again, dynamic tag must have own energy supply. It has longer range and bigger recollections. It can store extra data sent the RFID peruser. RFID peruser is an investigative specialist. RFID frequencies range between 30 kHz and 2.5GHz to recognize question remotely. A fundamental RFID framework comprise of three parts a reception apparatus or curl a handset (with decoder) a transponder (RF tag) electronically customized with extraordinary data the innovation can likewise be utilized as a part of toll Collection at toll doors and this empowers the following of vehicles and additionally the merchandise they convey, continuously.

Area tests done demonstrate that RFID is the best innovation for following things in movement. The innovation empowers remote stockpiling and recovery of information and this is the reason improvements towards remote distinguishing proof point towards low-transmission capacity frameworks like RFID.

In this framework, an electronic framework consequently recognizes a drawing closer vehicle and records the vehicle number and Time. In the event that the vehicle has a place with the approved individual/bunch, it naturally opens the Toll Gate and a foreordained sum is consequently deducted from its record. Exchange is been presentation on LCD screen. As vehicle pass toll square IR sensor distinguish it and close the entryway.

II. EXISTING SYTEM

There are two methods for gathering toll expense being by and by at present.

☐ First is the conventional manual technique where one individual gathers the cash and issues a receipt. Where vehicle is been ceased and further a specific sum is been reasoned relying upon vehicle sort. Along these lines halting the vehicle on the particular time on the court.

☐ Second one is utilizing Smart Card framework where the individual needs to scratch the savvy card to the framework introduced at the toll charge court to open the hindrance.

Along these lines the both frameworks including the toll court a line both the already said technique for gathering toll assessment is tedious strategy. Odds of getting away from the installment of toll duty are there. It prompts lining up of taking after vehicles.

Fig 2.1 Existing System Diagram

III. PROPOSED SYSTEM

The framework is executed to naturally a more advantageous method for gathering the toll and movement administration. It's called Electronic Toll Gate Stations utilizing RFID and ZigBeeTechnologies. The execution is separated into the outline of three modules, Vehicle Module

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(ActiveTag) and the Central Database Module, Tollgate station. The three modules impart by means of GSMmodem associated with every module. The exceptional component of RFID labels it gives Security through This report clarifies the implantation of robotization in toll court which is a stage towards enhancing the observing of vehicles, going in foreordain courses.

The point of our undertaking is to outline a framework, which consequently recognizes a drawing nearer vehicles and record vehicles number and time. On the off chance that the vehicle has a place with the approved individual, it naturally opens the toll door and a foreordained sum is consequently deducted from its record. This mean diminished Traffic clog at toll courts and aides in lower fuel utilization. This is critical favorable position of this framework.

The usage can be isolated into the outline of four modules, Vehicle Module (Active Tag) RFID Reader, Central Database Module and Tollgate station.

A. Vehicle Module (Active tag)
Vehicle module utilized a little RFID tag (i.e. prepaid savvy card). Set on front side of windshield. In this prepaid card contain adequate sum which is deducted by RFID peruser.

B. RFID Reader Module
RFID Reader module sweeps and check the register vehicle going through toll court. The peruser deducting the sum if card is legitimate.

C. Focal Database Module
Database module is been isolated into two sub framework first module spare the data about RFID tag(Smart card) and second database module produce the record (e.g.vehical no., vehicle in-out time, deducted amt and so on.)

D.Tollgate Station
The benefits for the motorists include:
1. Fewer or shorter queues at toll plazas by increasing toll booth service turnaround rates.
2. Faster and more efficient service (no exchanging toll fees by hand)
3. The ability to make payments by keeping a balance on the card itself
4. The use of postpaid toll statements (no need to request for receipts)
5. Lowered toll collection costs
6. Better audit control by centralized user account and
7. Expanded capacity without building more infrastructures.

PROPOSED ALGORITHM
STEP 1:Start

STEP 2: Declaration and Initialization // Input : Rt(RFID Tag), Rr(RFID Reader)=1, gate=1;

STEP 3: IF Rt:=Registered THEN GOTO Step 4 ELSE GO TO Step 6

STEP 4 : IF Rr:= 1 THEN GOTO STEP 5 ELSE STEP 7.

STEP 5: gate:=1 and GOTO Step 8.

STEP 6: Register for New User and GOTO Step 3.

STEP 7: STOP

STEP 8: END

IV. SYSTEM ARCHITECTURE
In the working stream of the paper we are making different sorts of model of actualizing of activity controlling robotized toll square framework.

In the initial step of the undertaking we are making shrewd card which contains the particular sum which is utilized as a part of the toll square framework. After that there are making two sorts of database first database keep up the individual data about the client and second database contain the client vehicle in-out data from the toll square framework.

In the working stream of the undertaking are as per the following, First enrolled the individual data of the client to purchase the keen card specifically community for getting to the card in the toll square. That savvy card will be altered on the internal side of the front will move of the mirror. That card just altered by the organization if any client adjust or changes that brilliant card it will be debased. On the off chance that any vehicle come in the contact of the any toll square framework which contain RFID peruser module that module check the if the shrewd card (which is settled on the vehicle) enrolled then particular sum will be deducted from the card (rely on the card sort for vehicle, for example, LMV or others) and if the card not enlist then the no sum will be deducted from the card and no toll door will be open. On the off chance that the card is enlist then sum is deducted and toll door is open. There are a few sensors are settled on the toll court. On the off chance that vehicle is gone from the sensor client get the message from the toll court. After that client data in-out vehicle status will be put away in the database. For removing the sum in the card client as energize framework in the toll square framework.

Likewise for the future perspective there are some idea are included our task. by chance your vehicle is robbery .Through the keen card(which is settled on the vehicle) client vehicle will be catch. Just that time vehicle be catch when the client call to the specific focus (where client purchase the keen card) and the middle can hinder the card and dynamic the GPS framework which is inherent the card of the shrewd card. It additionally another way vehicle will be catch if any vehicle will be come in the toll court framework that square card will be not get to be the RFID peruser module. Without confirmation vehicle won't be gone from the toll square. From that whole framework client discovered its vehicle..

Fig 4.1 System Architecture

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V. ADVANTAGES

Here are some favorable circumstances that can be part into the accompanying areas:

Precision: Several tests were keep running amid the Zimbabwe International Trade Fair (ZITF) for the entire week and the RFID framework recorded passages precisely. The framework figured out how to distinguish every one of the autos that went through it. The serial correspondence between the PIC and the PC was likewise more than once tried. The outcomes demonstrated that there were neither undesirable extra bits nor lost bits. There were no occasions when the entryway neglected to open when it should, neither did it neglect to close when it should. By and large exactness was high and the creators prescribe the utilization of RFID in personality location notwithstanding for auto parks and entryway passages.

Security: The framework ended up being secure since it couldn't be broken without the login points of interest. No unapproved client should sign on to the framework, on the off chance that they may begin altering their equalizations. Be that as it may it is extremely troublesome for endorsers of clone RFID labels and begin utilizing them as a part of the street in light of the fact that an unrecorded/obscure label ID is not permitted to pass. The configuration can likewise incorporate IP Cameras for expanded security.

Money related Costs: However, with the misfortunes that can be brought about in view of the paper tickets, the expense of introducing and utilizing the RFID Automatic Tollgate System is exceptionally irrelevant. It must be noticed that manual paper tickets can be cloned and repeated from some place.

Pace of operation: The exploratory results demonstrated that a model auto can be recorded and permitted to go in on a normal of 5 seconds. This makes it a speedier framework that the one used to issue tickets physically. This outline was useful at model level utilizing low power engines to work a blast door.

Equipment accessibility: However a portion of the parts required to assemble the mechanical and charging side are promptly accessible. Truth be told the PIC18F452 utilized here is accessible as a part of the nation albeit more costly. Shoddy accessible segments incorporate the serial correspondence connectors, MAX232s, RS232s, resistors, transistors and transfers.

VI. CONCLUSION & FUTURE WORK

RFID is not replacement of Bar code but it is a technology offering various features. RFID offers highly reliable data collection in harsh environments. 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. Reading items and objects in motion can be done accurately using RFID. A system developed with a log in windows enables security and the overall cost of implementing the system may seem no reliable source of power the system just becomes a white elephant and is of no use unless if a solar power supply is installed on site. This decreases reliability of the system and incurs extra costs on unplanned workforce coming to manually collect the venue, in which case they will most likely start looting money.

FFID offers highly reliable data collection in harsh environments. This technology can provide new features like scanning, detecting as well as an efficient method to collect , manage, store, analyze, which not only eliminate manual data, but also inspires new automation solutions. It costs less and increase revenue generation.

REFERENCE

[1] Sachin Bhosale, Dnyaneshwar Natha Wavhal, "Automated Toll Plaza System Using RFID," *International Journal of Science, Engineering and Technology Research*, Vol.1, Issue1, Jan 2013.

[2] Sudha Bhalekar, Adesh Chanageri G, Indra Prakash Chauhan, "Automatic Toll Tax Using RFID," *International Journal of Engineering Research & Technology,* Vol.3, Mar 2013.

[3] V. Sandya, A. Pravin, "Automatic Toll Gate Management and Vehicle Access Intelligent Control System Based on ARM7 Microcontroller," *International Journal of Science, Engineering and Technology Research*, Vol.1, Issue 5, Jul 2012.

[4] The Time's of India paper April 20, 2012 "*Now Road toll can be paid without stopping at Toll Plazas".*

[5] The Time's of India paper May 28, 2012 "High-Tech number plates for 20 lakh vehicles soon".

[6] Janani Krishnamurthy, Nitin Mohan, Rajeshwary Hegde, "Automation of Toll Gate and Vehicle Tracking," *IEEE International Conference on Computer Science and Information Technology*, Aug 2008.

[7] Tom Pettruzzelis*,"TELEPHONE PROJECTS FOR THE EVIL GENIUS",* BPB PUBLICATIONS

[8] H. Vogt. Efficient Object identification with passive RFID tags. In F.Mattern and M. Naghsinesh, editors, International Conference on Pervasive Computing. Volume 2414 of Lecture Notes in Computer Science, pages 98-113, Zurich, August 2002. Springer-Verge

[9] Klaus Finkenzeller, "*RFID Handbook: Radio-Frequency Identification Fundamentals and Applications".* John Wiley & Sons, 2000.