ISSN 2395-695X (Print)
ISSN 2395-695X (Online)

International Journal of Advanced Research in Biology Engineering Science and Technology (IJARBEST)

Vol. 2, Special Issue 10, March 2016

ONLINE TOLLGATE MANAGEMENT SYSTEM

[1]Ranjani.S, [2]Kalpana.K, [3]Kiruthika.V, [4]R.Sathish
[123] UG Scholars, [4]Assist.Prof
Computer science engineering,
surya engineering college,
Mettukadai, erode, tamilnadu.
ranjanicse95@gmail.com,kkalpanacse@gmail.com,vkiruthikaerode@gmail.com

Abstract- *Toll gates are usually considered an inconvenience by travelers not only for the cost of the toll, but also for the delays at toll booths, toll roads and bridges. In order to ensure a steady flow of traffic, both staff and drivers require easy access to an efficient communication system covering the specific requirements of toll gates. In this way, hitches can be resolved while maintaining a convenient toll gate system. Security systems can also be added, which will further enhance the system. In this paper we are adding various safety &security measures to the modern toll gate system to avoid the security and safety threads. This paper is designed using a FPGA Xilinx Spartan 3AN with the help of VLSI technology. We calculate the amount based upon weight so vehicle user cannot loss the money. In this paper we are using Gas sensor for recognizing unwanted gases. Key words: hitches, security, FPGA Xilinx Spartan and 3AN, safety, manual toll collection, easily programmed, GSM.*

INTRODUCTION

The toll gate system using RFID technology enables the electronic collection of toll payments. This technology has been studied by researchers and applied in various highways, bridges, and tunnels requiring such a process. This system is capable of determining if the car is registered or not, and then informing the authorities of toll payment violations, debits etc. The most obvious advantage of this technology is the opportunity to eliminate congestion in tollbooths, especially during festive seasons when traffic tends to be heavier than normal. It is also a method by which to curb complaints from motorists regarding the inconveniences involved in manually making payments at the tollbooths. Other than this obvious advantage is that it could also benefit the toll operators.The benefits for the motorists through this system can be fewer or shorter queues at toll plazas, faster and more efficient service (no exchanging toll fees by hand), the ability to make payments by keeping a balance on the card itself or by loading a registered credit card. The use of postpaid toll statements (no need to request for receipts). Other general advantages for the motorists include fuel savings and reduced mobile emissions by reducing or eliminating deceleration, waiting time, and acceleration.This system commonly utilizes radio frequency identification (RFID) technology. RFID is ageneric term used to identify technologies utilizing radio waves to automatically identify people or objects. RFID technology was first introduced in 1948 when Harry Stockman wrote a paper exploring RFID technology entitled, “Communication by Means of Reflected Power”. RFID technology has evolved since then and has been implemented in various applications such as in warehouse management, library system, attendance.

ISSN 2395-695X (Print)
ISSN 2395-695X (Online)

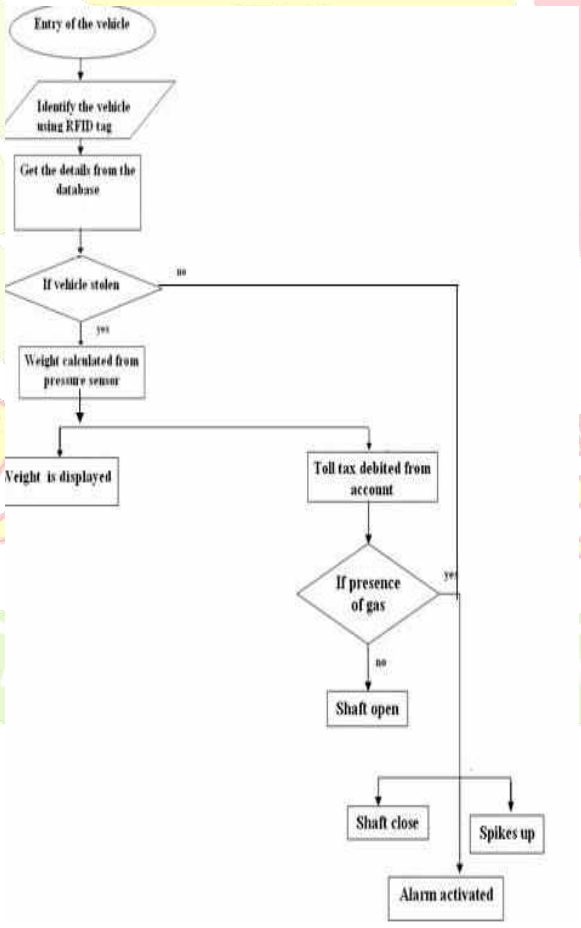
International Journal of Advanced Research in Biology Engineering Science and Technology (IJARBEST)

Vol. 2, Special Issue 10, March 2016

Existing System Problems:

The existing system consists of a microcontroller,
RFID reader, RFID Tag, stepper motor, and bill printer. The reader retrieves the information about the ID number and identifies the vehicle. Then for the tax to be collected the bill is printed at the time of exit. The stepper motor here is used to open and close the gate automatically. In the existing system, though there is an RFID reader the tax collection is manual and not automated. There are no security features such as identifying a stolen vehicle etc. The toll tax which is collected for all the vehicles is the same and the tax collected is notbased on the load carried by the vehicle.

OVERALL FLOWCHART:



PROPOSED SYSTEM

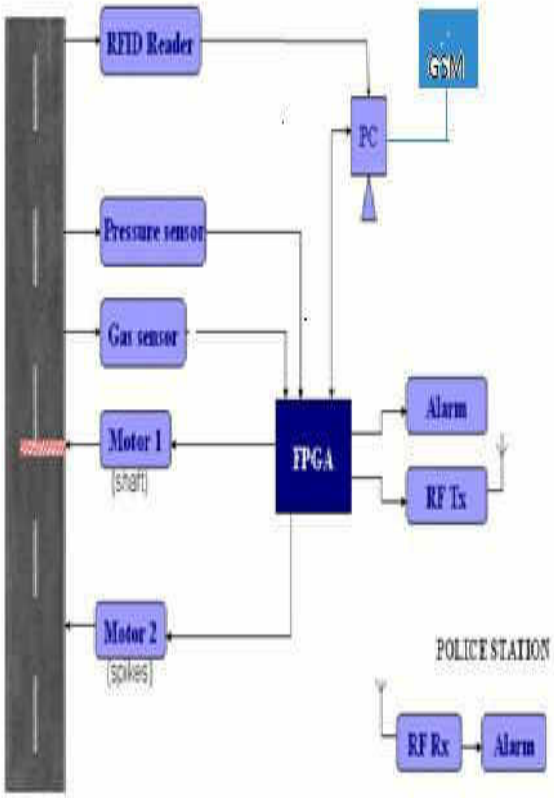
ISSN 2395-695X (Print)
ISSN 2395-695X (Online)

International Journal of Advanced Research in Biology Engineering Science and Technology (IJARBEST)

Vol. 2, Special Issue 10, March 2016

The proposed system makes sure that the traffic at the toll gates is streamlined and security is alsopresent. The tax which is collected is based on the load carried by the vehicle. Through this system we can also identify stolen vehicles.The proposed system having all components is centralized with FPGA SPARTAN 3AN. Every vehicle must have a unique RFID Tag for store the Vehicle name and user's details.

Figure 1 Block Diagram of proposed system:



An RFID tag is installed on each vehicle with read/write memory. An RFID reader at the gate reads this data from the vehicle as it approaches the toll booth. RFID reader communicates with PC using UART (Universal Asynchronous Receiver/Transmitter). UART takes bytes of data and transmits the individual bits in a sequential fashion. PC consists of the entire database which is updated periodically. Now after reading the information, PC compares the data in the database and allows the access accordingly by opening/closing the gate. The pressure of the vehicle is obtained using the pressure sensor and accordingly the pressure of the vehicle is displayed on the display. A counter is used to count the number

ISSN 2395-695X (Print)
ISSN 2395-695X (Online)

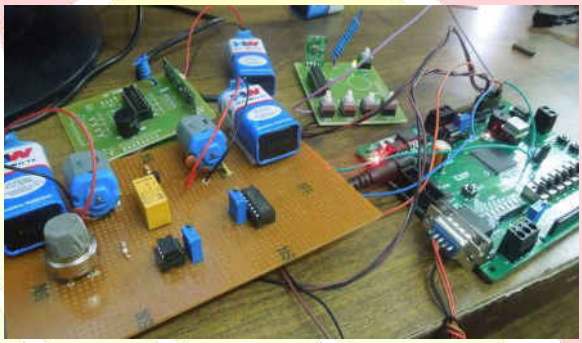
International Journal of Advanced Research in Biology Engineering Science and Technology (IJARBEST)

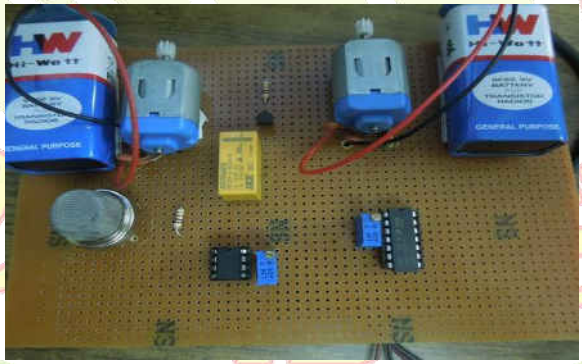
Vol. 2, Special Issue 10, March 2016

of vehicles. The amount on the basis of weight & the count of vehicles is also displayed on the screen. The amount to be paid is automatically deduced from the respective bank account.

PROTOTYPE RESULTS:

The results obtained using our proposed system is as follows.
This is consist of all modules are centralized with
FPGA. Here we are use different modules for different applications.





OVERALL HARDWARE

All are work together to get proper output. This is consist of all modules are centralized with FPGA. Here we are use different modules for different applications. All are work together to get proper output. In the above figure consist of a FPGA, RF transmitter, RF receiver, RFID Reader, gas sensor,pressure sensor, motors and relay which are connected together. Our project is a unmanned toll gate system which makes toll tax to be collected automatically,provides security, and traffic free which does not require any manual supervision. If any vehicle is stolen are gas is carried then it immediately alarms the surroundings and to the nearby police station in the mean while it switched the motor 1 and 2. Here motor 1 is a shaft and and motor 2 produces spikes. The above figure1&2 shows the motor and gas module, RF transmitter, RF receiver, RFID reader RFID Tag. These modules work simultaneously which is controlled by FPGA. the information from the RFID Tag which is installed in all the vehicles. The information is compared with the data in PC database. If the vehicle is found to be stolen then it alters the surroundings and

ISSN 2395-695X (Print)
ISSN 2395-695X (Online)

International Journal of Advanced Research in Biology Engineering Science and Technology (IJARBEST)

Vol. 2, Special Issue 10, March 2016

through the RF transmitter it signals the RF receiver which is in the nearby police station. Similarly the same procedure is carried out when a gas is detected by a gas sensor. Pressure sensor is used to detect the pressure of the vehicle and accordingly the toll tax is detected from their account automatically.The program is loaded into the FPGA first using Xilinx software. Then using visual basic we implement in system.Visual basic window is opened first. The port numbers are entered based on the com ports that are connected.

Figure 3: Layout & Amount and pressure chart:

After the reader identifies the tag the vehicle details are displayed. When the pressure is given the balance amount is deducted

CONCLUSION:

Our system is a user friendly toll fee method this can save time and reduce traffic congestion at toll gates and provide solution for users to reach their destination without wastage of time. It gives the toll authorities the flexibility to set variable pricing for toll services and thus a fair policy of tax collection can be followed. This way there is no loss incurred by a person carrying a vacant vehicle.. Here there is no cash transaction for the toll lanes, so cash handling is reduced. Thus difficulties with cash handling are eliminated and this way aid in enhanced audit control by centralizing user accounts. Information such as vehicle count over the time of the day, date, time etc can be obtained due to the deployment of this technology. This helps in making decisions regarding the pricing strategies for the toll providers. It also helps planner to estimate the travel time that aid in designing decisions.

REFERENCES:

[1] Kin Seong Leong, Mun Leng Ng, *Member*, *IEEE*, Alfio R. Grasso, Peter H. Cole, "Synchronization of RFID Readers for Dense RFID Reader Environments", International Symposium on Applications and the Internet Workshops (SAINTW'06), 2005
[2] Manish Buhptani, Shahram Moradpour, "RFID Field Guide - Developing Radio Frequency Identification Systems", Prentice Hall, 2005, pp 7-9, 16-225, 160, 231
[3] Raj Bridgelall, Senior Member, IEEE, " Introducing a Micro-wireless Architecture for Business Activity Sensing ", IEEE International Conference RFID, April 16-17,2008
[4] Sewon Oh, Joosang Park, Yongioon Lee, "RFID-based Middleware System for Automatic Identification", IEEE International Conference on Service Operations and Logistics, and Information 2005.

.