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Online Payment Of Tolls And Tracking Of Theft Vehicles Using Number Plate Image

[1] A.V.Allin geo
[1] Assistant Professor, Dept. of CSE, BIST,BIHER,Bharath University, Chennai, Tamil Nadu

Abstract: ***The automated toll collection system using passive Radio Frequency Identification (RFID) tag emerges as a convincing solution to the manual toll collection method employed at tollgates. Time and efficiency are a matter of priority of present day. In order to overcome the major issues of vehicle congestion and time consumption RFID technology is used. RFID reader fixed at tollgate frame (or even a hand held reader at manual lane, in case RFID tagged vehicle enters manual toll paying lane) reads the tag attached to windshield of vehicle. The object detection sensor in the reader detects the approach of the incoming vehicle's tag and toll deduction takes place through a prepaid card assigned to the concerned RFID tag that belongs to the owners' account. This makes tollgate transaction more convenient for the public use.***

I. INTRODUCTION

Automated toll collection (ATC) is a technology enabling the electronic collection of toll Payments. It has been studied by researchers and applied in various highways, bridges, and tunnels requiring such a process.

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, applying ATC could also benefit the toll operators. Thus, the ATC system is a win-win situation for both the motorists and toll operators, which is why it is now being extensively used throughout the world.

An ATC system commonly utilizes radiofrequency identification (RFID) technology. RFID is a generic term used to identify technologies utilizing radio waves to automatically identify people or objects. RFID technology was first introduced in 1948 when Harry Stockman since then, and has been implemented in various applications, such as in warehouse management, library system, attendance system, theft prevention, and so on. In general, RFID is used for tracking, tracing, and identifying objects.

A complete RFID system consists of a transponder (tag), reader/writer, antenna, and computer host. The transponder, better known as the tag, is a microchip combined with an antenna system in a compact package. The microchip contains memory and logic circuits to receive and send data back to the reader.

These tags are classified as either active or passive tags. Active tags have internal batteries that allow a longer reading range, while passive tags are

II. EXISTING SYSTEM

Road tolls were levied traditionally for a specific access (e.g. city) or for a specific infrastructure (e.g. roads, bridges). Tolls are a form of user tax that pays for the cost of road construction and maintenance without raising taxes on non-users. Tolls are paid by hand at a toll gate, payments are generally made in cash. User deposits a certain amount at a tollgate depending on his vehicle type and the authorities allow passage or entry.

In the current times of increasing traffic on the road, it is important to collect the toll tax in a managed and controlled process so that it doesn't result in a total unorganized jungle of traffic. It is very challenging to handle a vehicular flow by a manual system of revenue collection. Poor management at toll plaza may result into great chaos and revenue loss, which is not desired.

III. PROPOSED SYSTEM:

In this application "Automated Toll Collection System" toll collection is carried out using RFID technology the reader reads the information in the tag and the transaction takes place through a centralized database. If the balance on the prepaid card is low a text message is forwarded to the tag owner's phone prompting for a recharge. The RFID tag on the vehicle also helps in the recovery of a lost vehicle when a police case is lodged by its owner.

Road users also have the chance to choose either a prepaid or a post-paid tag. At the entrance point, the system will record the users' information with their preferred method (i.e., prepaid or post-paid).Then, at the end of the entrance point, the system will calculate the kilometres driven and then deduct payment straight from the tag (for prepaid users); if the balance is not enough, the barrier will still be lifted, but a warning email or an SMS will be sent to the owner.

If the owner fails to pay the excessive amount, the tag will be barred. For the post-paid system, a bill will be sent to their respective homes at the end of every month. If the users fail to pay the Amount, their tags will also be barred. Using this system, all problems related to manual toll fee collection will be eliminated, there by achieving a higher efficiency rate per transaction. This is because this system requires no human interactions that could lead to cheating and human errors.

IV. DESIGN STRUCTURE

The input design is the link between the information system and the user. It comprises the developing specification and procedures for data preparation and those steps are necessary to put transaction data in to a usable form for processing can be achieved by inspecting the computer to read data from a written or printed document or it can occur by having people keying the data directly into the system. The design of input focuses on controlling the amount of input required, controlling the errors, avoiding delay, avoiding extra steps and keeping the process simple. The input is designed in such a way so that it provides security and ease of use with retaining the privacy. Input Design considered the following things:

- What data should be given as input?
- How the data should be arranged or coded?
- The dialog to guide the operating personnel in providing input.
- Methods for preparing input validations and steps to follow when error occur.

OUTPUT DESIGN

A quality output is one, which meets the requirements of the end user and presents the information clearly. In any system results of processing are communicated to the users and to other system through outputs. In output design it is determined how the information is to be displaced for immediate need and also the hard copy output. It is the most important and direct source information to the user. Efficient and intelligent output design improves the system's relationship to help user decision-making.

The output form of an information system should accomplish one or more of the following objectives.

- Convey information about past activities, current status or projections of the
- Future.
- Signal important events, opportunities, problems, or warnings.
- Trigger an action.
- Confirm an action.

ARCHITECTURE DIAGRAM:

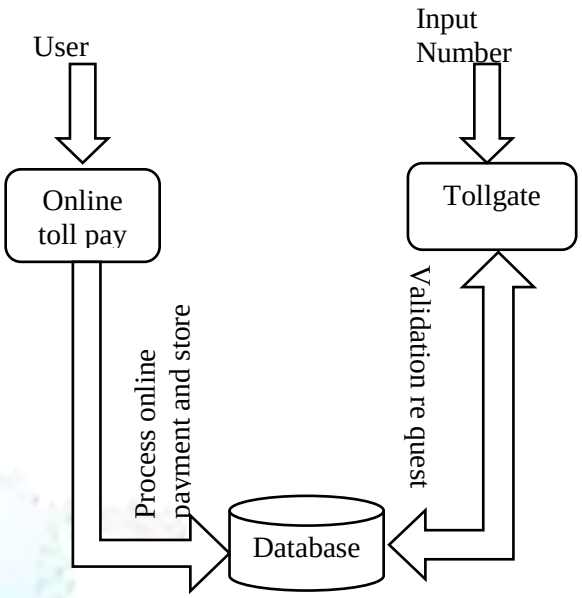

Fig 4.1 system architecture.

V. FUTURE ENHANCEMENT

In our present concept we are only using the RFID system for vehicle detection. So we can extend the scope of this concept in other way for centralize data recording. For that purpose we can use the IR courten at the entry gate which is followed by the Camera which will be continuesly capturing the images of the vehicles entering into the toll plaza. And the third step the RFID is collecting the vehicle number. Now when the vehicle passes through the IR courten it tresses the outline of the vehicle, in the next step the camera will take the image of the vehicle & followed by the RFID to record the data related to the vehicle. The load cell weighs the vehicle & classifies it into two categories as light & heavy vehicle respectively. The whole data collected together & sent to the centralize server which will store it for stipulated time. This application will help in detecting the vehicles in the crime cases like terririsom& smuggling of goods & it will also reduce the load on check posts.

VI. CONCLUSION

By doing automation of toll plaza we can have the best solution over money loss at toll plaza by reducing the man power required for collection of money and also can reduce the traffic indirectly resulting in reduction of time at toll plaza. In our project we have introduced the techniques such as Radio Frequency Identification. This technique will include the RFID tag & reader which in coordination with each other can be used to detect the vehicle identity. The load cell plate which is introduced for weighing the vehicles so as to classify them in different categories as light & heavy vehicles. The IR Trans receiver is used for detecting the presence of vehicle at different locations which will act as the gate pass to the toll plaza. By effectively utilizing these three techniques at different stages of our project we are able to represent the automation in toll plaza which will reduce the complete processing time by few seconds which is very important as well as helps to reduce money leakage in a very cost effective manner.

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