

# Smart Vehicle Card Using IOT

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**Abstract-** *The number of vehicles on roads in metropolitan cities, the cases of road accidents and traffic rules violation are increasing. It becomes difficult to find a parking space. The systems for parking and toll system are not Fully automated, it is semi-automated everywhere. The Internet of Things can connect anything and anybody world wide. Smart Cards make use of some sensor devices that are used to carry the device-related information to the Internet. Smart Card will be extended to store the information regarding the vehicle registration, vehicle type, vehicle owner's license details, vehicle pollution details, vehicle challan details and vehicle insurance details.*

**Keywords-** Smart Card, Internet of Things, RFID

## I. INTRODUCTION

**Vehicle Parking** is a system that helps drivers to find a vacant spot using sensors in each parking space by detecting the presence or absence of a vehicle. Parking systems are generally powered by electric motors . Population, and number of vehicles increases and due to unmanaged parking it leads to many problems. The **Toll Management System** Nowadays in this world all are very busy with their tight schedules. The collection of tolls on toll plaza is a time consuming process due to traffic congestion and it causes inconvenience to the public. Here the priority is for time and efficiency. The TMS was designed to resolve the problem of the different charging unit on the highway where the charging units set their own closed Facilities for charging toll plaza. These road calamities are the parking space issue and the congestion at toll booths on highways leading to slow moving traffic. It may find endless queues of vehicles on highways waiting at toll plaza junctions to carry out cash transactions for paying the toll. To reduce traffic congestion and manual intervention, a **smart automated parking and toll system** has been implemented. It is able to store the important details of **vehicle information** like the vehicle registration details, vehicle type, vehicle owner's license details, vehicle pollution details, vehicle challan details and vehicle insurance details.[1]

Now days in **universities** around the world have utilized smart card on their campuses. This study has extended twenty different universities from four different regions of the world. We present different types of possible applications of

smart cards in university level a. It is identified through the different university web sites.[2]. **Secure Electronic Transaction (SET)** Protocol was specifically fixed wired networks and recently researchers have attempted to implement it on wireless environments, resulting in the **wireless networks**. **KSL** Protocol is a mobile credit card payment protocol.[3]

## II. LITERATURE REVIEW

The **automated parking system** increases the number of cars that can be parked in a garage. It provides more parking spaces since the cars are well organised parked. If you use automated parking system, you will need only a less area of land for building a garage. Car parking system in which micro controller senses the moment of cars and open the gate is vacancy available. And security is provided by using RFID module through RFID card and displays the information to LCD. IR sensor identify entry and exit of car[1].

Finger codes make use of binary digits to compare the query **fingerprint**. This method generates a **circular shape** of position by using a core as a center point. After the shape is define and the core is extracted. The window size of 199\*199 pixels which includes the entire circular shape image is cropped from the fingerprint. This method only use the **window size of 199\*199** which contains a circular

Shape for matching to speed up the matching process. The matcher uses 8 finger codes to represent the local features of the fingerprint for higher matching accuracy.[2]

**In Universities** the Student smart card application helps students as well as staff to manage official documents management, canteen bill payments, library management in college, schools and **educational institutes**. It is based on **INTRANET**. It helps staff personnel's to manage student's attendance. It is also helps students to pay their canteen bills just by using their smart card number which can be recharged through admin and can also be used in Library for book management and fine payment by students on late return of book. This will help to overcome the tedious manual work by replacing it with digital technology of smart cards. Attendance is very useful in colleges and schools to keep a track of

punctuality of students as well as preparation of list of blacklist according to the guidelines of University.[3]

### III. EXISTING SYSTEM.

**Existing System** There are two ways of collecting toll tax being in practice at present. First is the traditional manual method where one person collects the money and issues a receipt. The other one is Smart Card system where the person needs to show the smart card to the system installed at the toll tax depot to open the barrier. This type of system for collecting toll tax is time consuming method; there is long queue of vehicle at toll plaza chances of escaping the payment of toll tax.



Fig2 Existing Toll collection system

### IV. PROPOSED SYSTEM

#### We implementing Electronic toll collection system

It is increase in the number of toll plazas. These toll plazas have long queues and the time consumed in paying cash and returning change causes all the more delay. This type system is simple in construction; provide automatic toll collection and vehicle theft detection Using RFID. We have designed an IOT based Toll booth Manager System in which a person can use an RFID to pay the Toll charge. When the RFID is swiped, the system would check if it has sufficient balance and then deduct the toll charge and update the balance through IOT.

**It consists of four keys** by which the user can select the mode of toll collection. Once the RFID mode is selected, the LCD displays the message to show the RFID card. The card has to be then swiped on the Card Reader. After the card is swiped, the micro-controller: Arduino will check if the card is valid or not. If the card is valid then the micro-controller will check if the card has sufficient balance. The card balance is displayed on the LCD display. Once the micro-controller detects sufficient balance, the toll gate is opened and the vehicle is

allowed to pass through. We have used an IR-sensor i.e. Infrared Sensor to indicate that the vehicle has crossed the toll gate and the gate will be closed.If the card holder needs to recharge the card, the recharge mode is selected. The LCD will display that the Recharge mode is selected and instruct to show the card. The card has to be then swiped on the card reader. The LCD then shows the message to enter the recharge amount. The user has to enter the amount and then press Ok button.

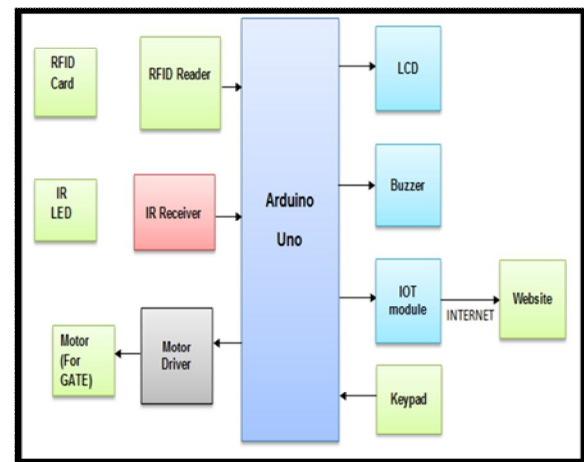


Fig1 Working of toll collection system

### V. METHODOLOGY

The components that are used in the IOT based Toll booth Manager System project are

- 1. RFID card reader** – Used to read the unique RFID card number and send to the Microcontroller
- 2. LCD** – Which will display informative messages like card balance, and if the card is valid or invalid .
- 3. Microcontroller** – Arduino, which reads the RFID card

number from the RFID reader, send data to the LCD and perform operations based on the mode selected and then send data to motor, if the card is valid OR to the Buzzer, if the card is invalid or has insufficient balance.

**4. Infrared Sensor-** used to detect that vehicle has crossed the toll plaza.

**5. Transmitter:** Infra-Red transmitters used are IR LEDs. IR rays from transmitters are reflected from the vehicle and are received by the receiver.

**6. DC motor and Motor Driver:** To open the gate and a motor driver IC is used to drive the motor .

## 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 paper, 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. By effectively utilizing this technique 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.

## VII. FUTURE WORK AND APPLICATIONS

1. IOT based Toll Booth Manager System can be used at all the Toll Plazas on the Highways Using this would help the vehicles to pass the Toll Plaza without stopping which in turn would help people save a lot of their time.
2. It can also be used at Octroi Collection booths.
3. It can be extended to send an SMS to the card holder whenever the card is swiped at any toll plaza along with balance details.
4. Voice System can be added in this project to indicate if the card is invalid or has insufficient balance

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