# Auto Penalty Collection Using IOT

**Singireddy Sreeja[1], Aditya Kumar[2], Shiva Bharath[3]**

[1,2,3]Student, Dept. of Computer Science and Engineering, Anurag Group Of Institutions, Hyderabad, India

---------------------------------------------***-------------------------------------------

Abstract-India is the second most populous country in the entire world and having more than 5.4 million kilometers of road network. And we all know how the roads are all chaotic and congested due to which many problems can be caused such as pollution, accidents, health related issues etc. This system identifies the individual vehicles using RFID tags attached to the number plates based on that it will check the pending bills instantly at the junction points and update the status to the webpage automatically. This system also collects challan instantly using RFID and IOT technology. Generally every vehicle user should maintain a minimum amount in RFID tags as per the government rule, based on that this entire system will work efficiently. The main emphasis of this project is to collect penalty for violating traffic rules which in turn will lead to a disciplined country.

**Keywords:RFID,IOT,Webpage,Traffic Rules,Penalty Collection.**

## I. INTRODUCTION:

India is very far behind any country in the world in terms of quality of roads. In India only 1 lakh kilometers roads are highways and about a few thousands are expressways so India is beating very behind in terms of quality of roads which in turn is leading to many traffic problems. Some major causes of the traffic problem in India are one of which is with the economic development the number of private owned vehicles in India has increased and this discouraged the people to use public transport system because in India the public transport facilities are not very well maintained due to which people are more inclined to have their own private vehicles which increases traffic problem on the roads, second one being the quality of roads, third one being the poor enforcement of traffic laws etc.

We have all seen some or the other person breaking traffic rules and getting away with it easily but the government has proved that violating these rules comes at a price. According to reports, India leads in the number of deaths caused by road accidents.1,40,000 people die every year in a road accident

To deal with the traffic issues our government has introduced the concept of Challan that is issued on a vehicle that violates the traffic rules and regulations that are being imposed in that place. There can be multiple reasons for imposing a challan some of which are:-

1. Jumping the Signal

2. Drunk Driving

3. Driving without holding a license

4. Not wearing a seat belt

5. Dangerous Driving

So our System aims at designing an intelligent system which helps the traffic department to collect pending previous penalty amounts using RFID and IOT technology. The result of this is the RFID cards which transmit a unique identification number. This number transmitted by the RFID can be read with the help of a RF reader. The device which is able to perform the task is a Microcontroller. RFID reader interfaced to Microcontroller. The microcontroller is programmed in such a way that it continuously reads the input from the RFID reader. To perform this task, the microcontroller is programmed using embedded 'C' language.

## II. PROPOSED SYSTEM:

In this proposal, we can clearly understand the use of the system for taking correct action against those vehicles that violate traffic laws at the correct time respectively. With the help of our system, the traffic police officers can easily do their job by reducing their manual efforts. It also plays an important role in inducing road discipline among people and is also much safer for the pedestrians. Firstly we use an Infrared Sensor in our system to detect the vehicle that has arrived. The RFID Reader reads the RFID tag of that particular vehicle and reads the data. In case of any existing challans or not being able to deduct the existing challan from the available balance it will display a Red LED Light depicting there is a due and in case of no dues or presence of sufficient balance to clear the dues, a Green LED Light would be displayed. All of the components are connected to the Arduino Uno Microcontroller and also a Wi-Fi module is used in order to view the challan and balance and the updated status at regular intervals at each step and to monitor the vehicles on a webpage.
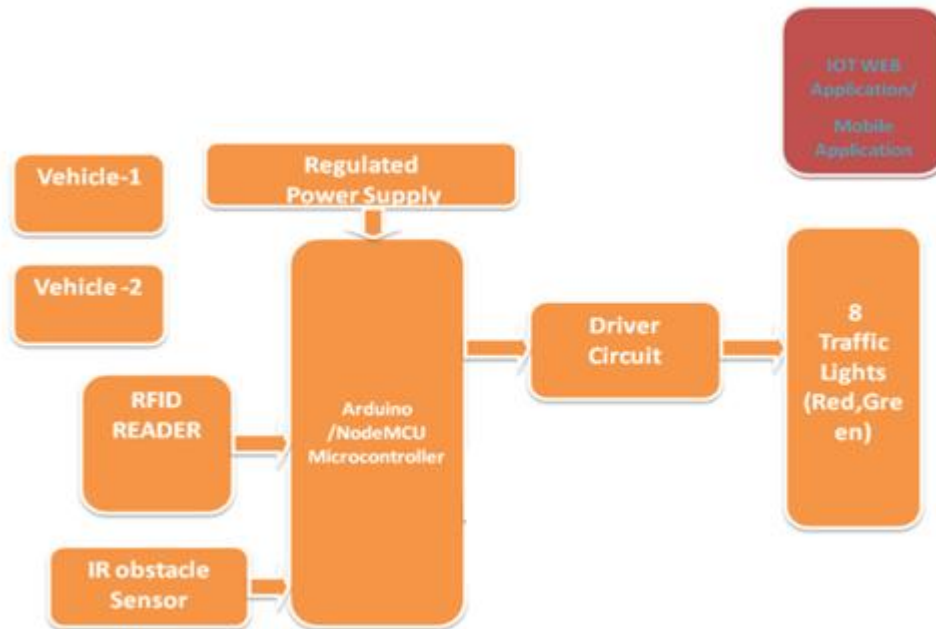
Figure 1.Working of the Proposed System

The components that were used as a part of the implementation process are as follows:-

1. Infrared Sensor:-IR Sensor is an electronic device that emits light in order to sense the object in its surroundings. It also detects the heat and movement of the object. Usually in the infrared spectrum all objects radiate some form of thermal radiation. These sort of radiations are invisible to human eye but are picked up by this sensor. So this helps us in detecting the arrived vehicle.
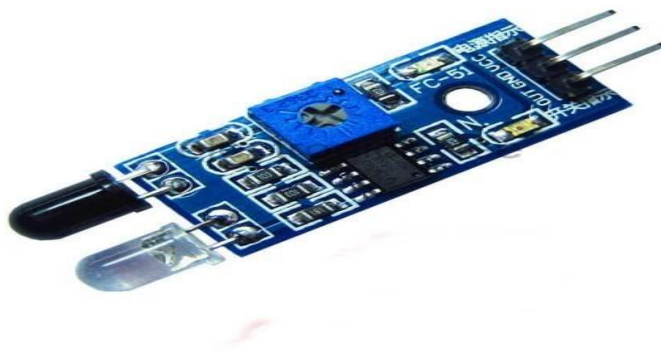


Figure 2. IR Sensor

2. RFID:-Radio Frequency Identification works on the principle of radio frequency or waves. This technology is used to automatically identify the objects or track the objects. So in this

RFID technology, the RFID tag is attached to the objects or in our case the vehicles and simultaneously the RFID reader emits radio waves so whenever the object or the vehicle is within the range of those waves then the tag transmits its feedback to the RFID reader. This technology can be seen in the case of unlocking hotel rooms and entering our cars.

The RFID system consists of two components:

a.RFID Reader - Three components make up the RFID Reader. It is responsible for reading the unique Id that is stored in each of the RFID tags. An RFID Scanner can read your tags and credit cards to automatically bill you

b.RFID Tag - The tags can be active tag, passive tag or a semi passive tag.
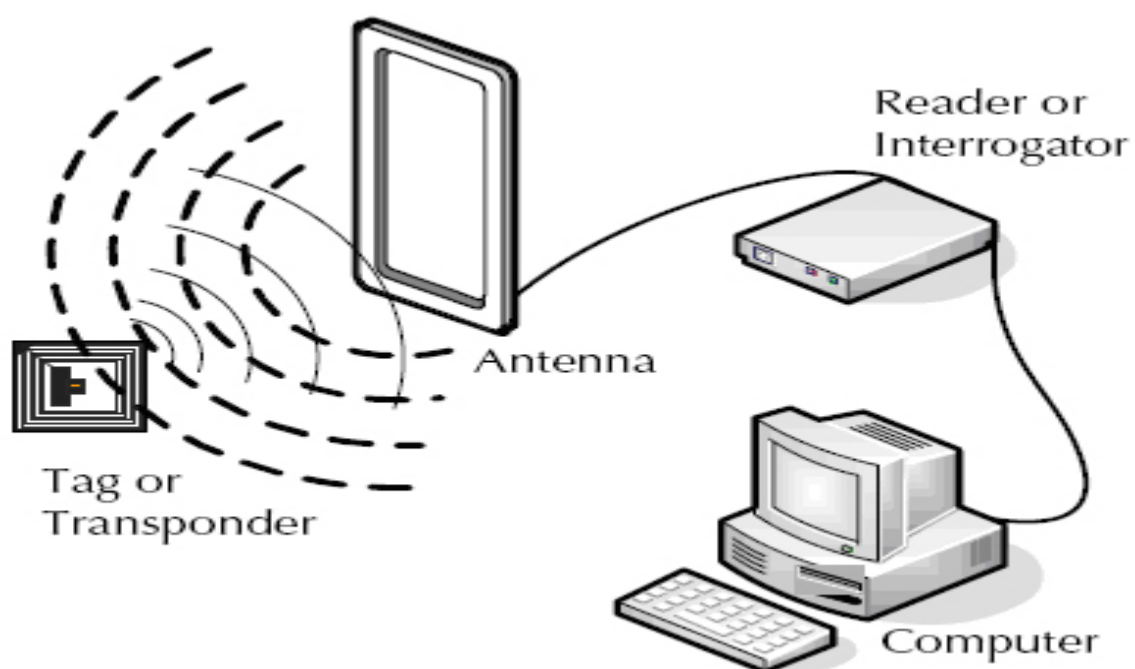
The tag is attached on the vehicle



Figure 3. Working of RFID

3. ESP 8266 Wi-Fi Module: It is a low-cost Serial-to-Wi-Fi Module that is it converts our serial information from our microcontrollers to give it to the Wi-Fi routers and in turn connect you to the internet. It uses 9600 baud rate to communicate with the microcontrollers.

It supports both TCP/IP and microcontrollers. It is actually used as an external Wi-Fi Module for the microcontroller.
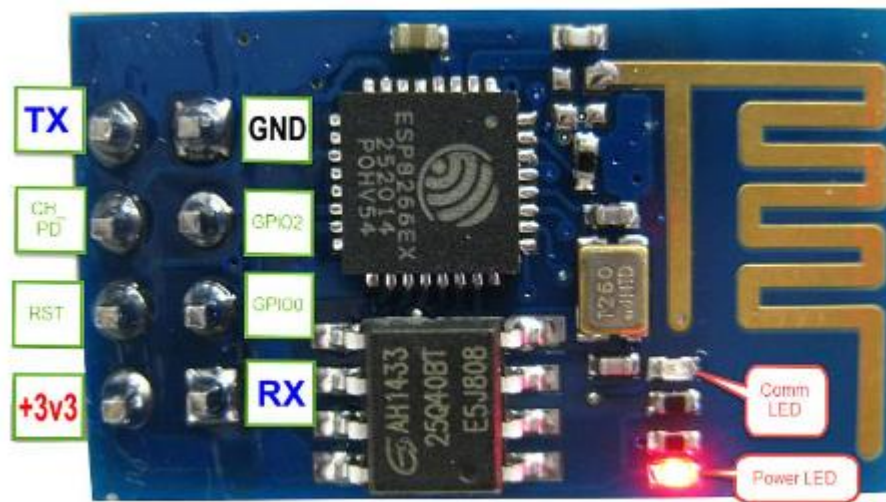


Figure 4.Wi-Fi Module

5. LCD: Liquid crystal displays have an advantage of being very easy to manufacture and mass-produce so they can be made quite inexpensively and they are very versatile devices. LCDs work in a principle of a liquid crystal which can align itself between two different polarized filters and then either let light pass or it can block light.



Figure 5.Liquid Crystal Display

6. Power Supply: A regulated power supply is an electronic device that maintains constant output voltage against the variation in input voltage, load current and temperature. This is used to power up the Arduino Uno.

7. LED: Light emitting diode is a p-n junction diode. These are widely used in semiconductor diodes. These diodes emit light when it is forward biased. We use Red and Green LED lights to depict whether a vehicle has dues or not.

All these components are connected to Arduino.

## III. RESULT:

In this Project, we will be using RFID Technology for detecting the existing challans and vehicles respectively and display them onto a webpage as well which will classify the information even more clearly whether the person has any existing unpaid challans or has no dues. The approach we will be using for this IOT project is as follows:

Step 1 – Firstly the IR Sensor detects the vehicle that has arrived and that is the time when it asks to show the RFID tag of that vehicle

Step 2 – The RFID Tag of the vehicle is shown.

Step 3 – The RFID Tag is then read by the RFID Reader. It first validates if the tag is a valid one and then checks for its data.

Step 4 – If there is challan and also enough balance to pay that challan, the challan will be automatically deducted from balance and the updated values will be reflected on the webpage and green led light will be displayed accordingly depicting that the vehicle can go.

Step 5 – If there is challan but not sufficient balance to clear the challan then red led light will be displayed.

Step 6 – If there is no challan at the first place then green led light is displayed depicting there are no dues and the vehicle can leave.

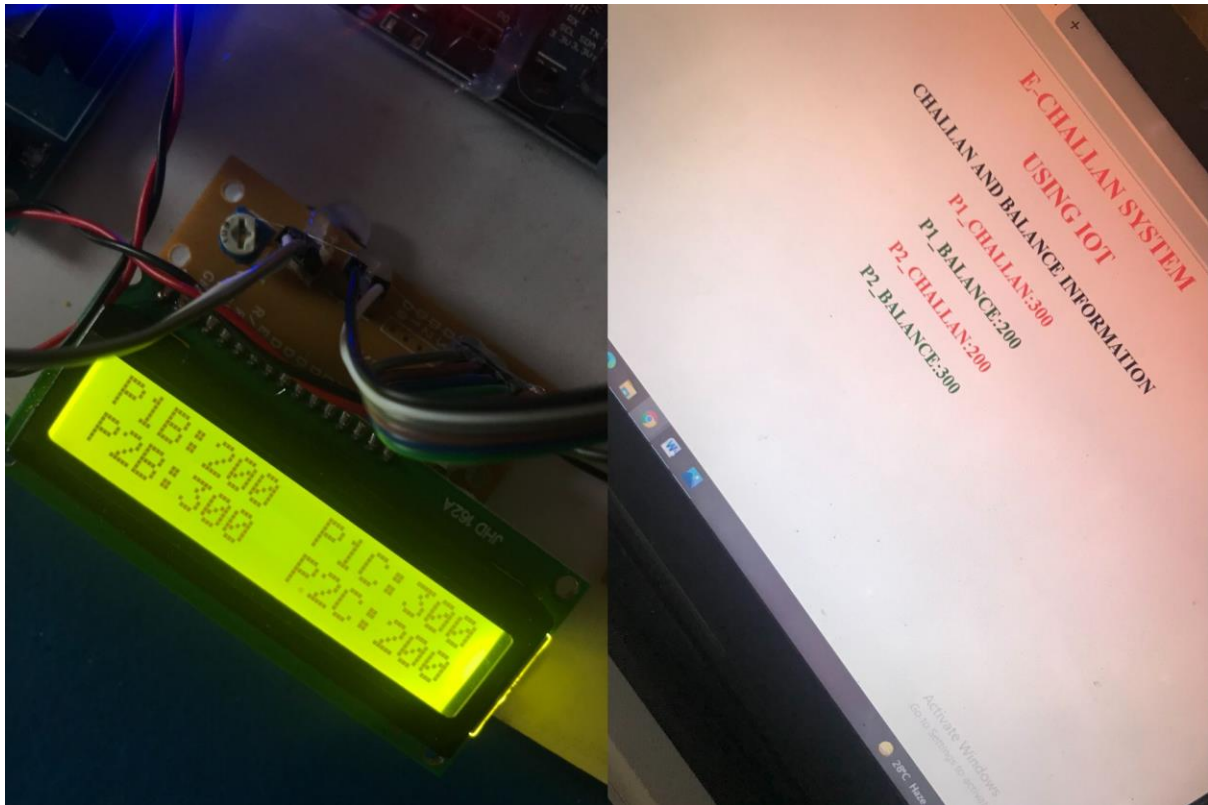Step 7 – The same process is repeated for every vehicle.
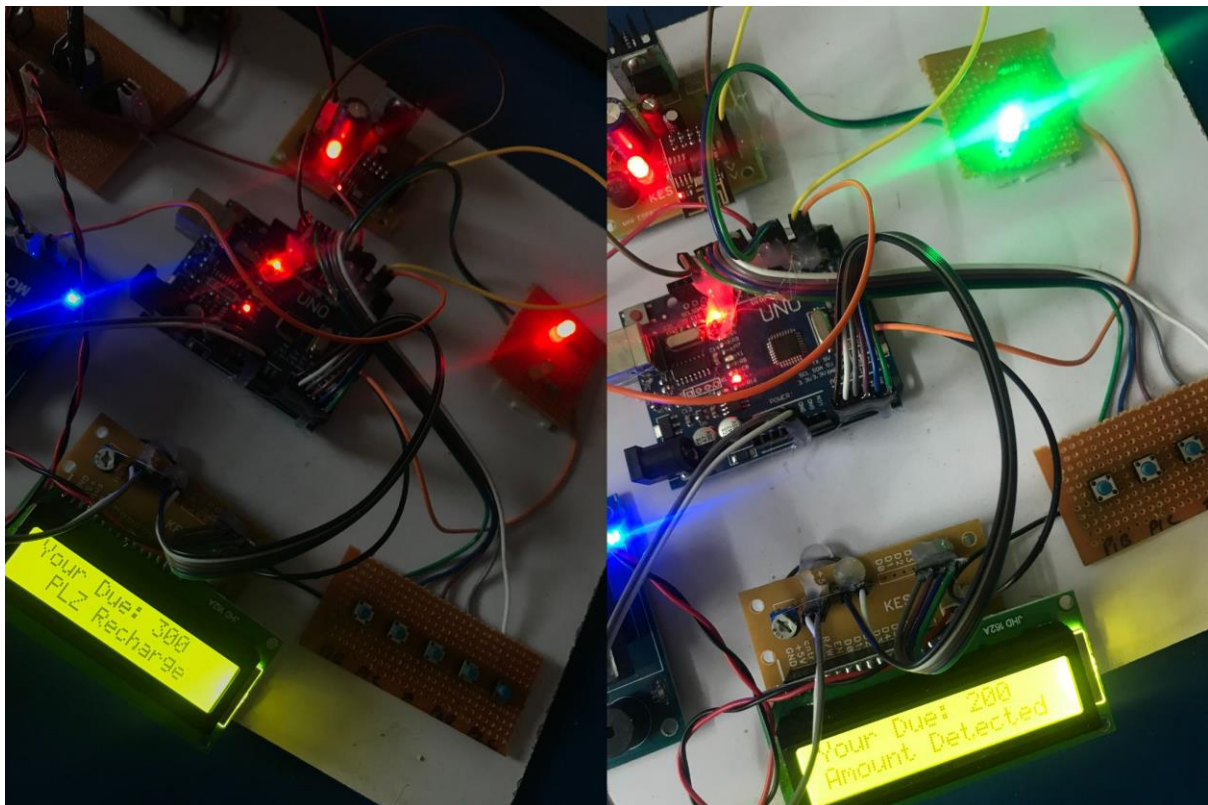
Figure 6.Updating Balance and Challan



Figure 7.Tags of both vehicles read by the Reader and Lights are displayed

## IV. CONCLUSION:

By doing automation of Penalty Collection we can have the best solution for collecting pending challan by reducing the manpower required for collection of money and also can reduce the traffic indirectly. In our system, we have introduced the techniques such as RFID tag and 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 penalty collection 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. It also major role in minimizing problems related to traffic which brings disturbance to the system and will help in reducing accidents; traffic jam which consumes most of our time.

## V. REFERENCES:

[1]. Traffic Congestion in Bangalore-A Rising Concern. [Online]. Available: http://www. Common floor. com/ guide/ traffic- congestion -in -Bangalore-arising- concern- 272 38. html, accessed 2013.

[2] Santosh Kumar Singh, Anshuman Tyagi, Brijesh Kumar Dubey, "Automatic Number Plate Recognition System for Vehicle Identification using Optical Character Recognition", International Journal for Research in Applied Science & Engineering technology(IJRASET),Volume-7,Issue IV,Apr-2019.

[3] Dhage, M. R., Patil, G. V., Mistry, S. J., Tambe, P. N., & Nankar, P. H. (2019, July). Automatic Traffic E-challan Generation Using Computer Vision. In International Conference on Sustainable Communication Networks and Application (pp. 203-213). Springer, Cham.