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A RESEARCH PAPER ON ADVANCE E-CHALLAN SYSTEM USING RFID AND IOT

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Abstract- Digitization and automation is the rule of the world and is quickly growing and covering the entire nations. There were days when it started with paper based system now be it anything automation is the key for faster delivery of any system.

Automatic E-challan generation for traffic violation is a PLC based project. The purpose of this project is to control the traffic violations by accurately penalizing the traffic violators. This will minimize the work of traffic police. This project is useful for controlling two types of traffic violations 1.Traffic signal violations 2.Toll-collection lane rule violation. In the first stage the vehicles that run a red light will be identified using a RFID reader. The RFID reader will input the PLC by scanning the tag placed on the vehicles. The database will be created in the program. When the RFID scanner inputs the vehicle, the PLC will immediately compare the barcode detected with the inputs fed into the database. In the second stage the vehicles breaking the toll-collection line rules will be correctly detected. Similarly like the first stage the comparison will be started with the data inputted in the database. The database will have the details of the vehicle.

Key words **: Arduino, RFID, ESP8266 Wi-Fi Module, AMS1117 Voltage Regulator, IOT, LCD Display.**

I. INTRODUCTION

Here the people who do not follow the traffic rules will automatically be imposed to a challan and will get notified using a message on their phone about when, where and how much challan has been imposed to them. Traffic inspectors' work has minimized using the system as they don't need to stop the running or over speeding person to impose him a challan. Basically an rfid tag will be attached to the vehicle which will have the user's information stored in them. Whenever the vehicle user crosses the traffic signalthe data will be stored and sentto the server.This datawill now be sent to a decision making system which will check whether the vehicle has crossed the signal on green signal or red signal. If the signal was green then no challan will be imposed and if the signal was red then a challan will be imposed automatically and the mobile number stored in the vehicle's rfid tag will receive a challan notification and the challan will also be sent to the RTO's database.

Traffic congestion is a major problem in cities of developing countries like India. Growth in urban population and the middle-class segment contribute significantly to the rising number of vehicles in the cities. In , priority based traffic lights controller using wireless sensor networks was discussed which was used to provide clearance to any emergency vehicleby turning all the red lights to green in the path of the emergency vehicle depending on the priority assigned to them The advantage of the system is that it can control the traffic over multiple intersections but it has few drawbacks.

II. LITERATURE SURVEY

In, there were different modules in which they store different information & having different service. In RTO it had process for registration of vehicle, their documents data all were stored in database in which they access from here. In maintenance or service provider they had whole document & information about location in which vehicle owner who face problem, they give service to them. This system also provided feature for detection of lost vehicle. Administrator had rights to verify the data entered by the user, processing of data and provide appropriate solutions. Any person who has been authorized by the administrator could use this system. An authorized user should have a user name and password to access detailed information from the site excluding for accessing general information in shared, public pages. In "Smart RTO Web and Android Application" it describes smart RTO & web application consist of web application for RTO administrator and the android application for the user. The user has to register for the services like insurance, license & RC book. If the traffic police caught the driver and asks for the license, insurance and vehicle documents the driver had to tell him the license number, insurance number manually and the traffic police will enter the details in his mobile app and the data stored on the server will be fetched regarding the documents. It influenced by RTO management system. This information was stored in database at server through on inline registration and server-side end. On client

side an android application was provided to police. After police logins into the system was able retrieve vehicle and license related information from the RTO database. If authentication fails, the information is provided to the police to retry else information about the use is displayed.

In "E-RTO management system" describes E-RTO is an advanced "E-RTO management System" which is design keeping in a view to make the existing registration and insurance system easier and faster. It included the entire registration and insurance procedure starting from the initial phase of entering till the result. Also, security was provided in the intermediate stages starting from the receiving of the application form to revealing the applicant number along with the expiry date of license are being dealt. Administrator was provided for authentication purpose as well as it could handle all the database of E-RTO and manage all the process. He had rights to approve learning license number, permanent license number, pass the vehicle registration number, offer insurance details to the user, etc. Facilities were provided by administrator. In , it showed the authentication of vehicle using RFID which was an advanced "ERTO Management System". It was designed keeping in view to make the existing registration and insurance system easier and faster. It included the entire registration and insurance procedure starting from the initial phase of entering till the results. All the intermediate stages starting from receiving of the application form to revealing the applicant number along with the expiry date of the license were dealt. This technology enabled the traffic police to be more effective in controlling repeat violators of traffic rules.

III. HOW DOES THE E-CHALLAN SYSTEM WORK IN INDIA?

The traffic police have introduced the CCTV-enabled e-Challan system in an attempt to eventually curb the rising number of road accidents in India. A CCTV camera continuously records footage of the ongoing traffic. If a motorist breaks any traffic rule, the act will be recorded in the footage. The police will try to extract the number from the vehicle's screen-shot captured from the CCTV footage and the offense will be registered in the records.

The traffic police will be then coordinate with the Regional Transport Office (RTO) to find the details of the vehicle and its owner. Details like the name and address of the vehicle owner, make and model of the vehicle, etc. As soon as they receive the details, an SMS will be sent on the registered phone number of the violator. This SMS will contain the time, date and location of the offense.

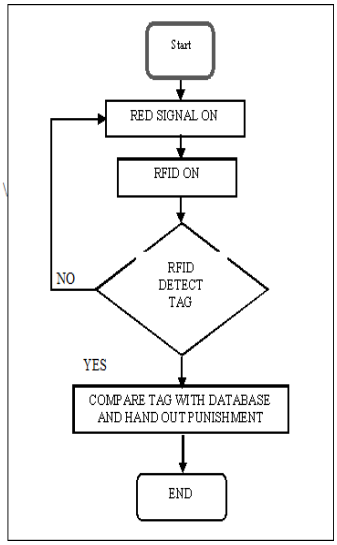
The following are the components used in this system

Microcontroller

A microcontroller (MCU for microcontroller unit, or UC for µ-controller) may be a tiny laptop on one microcircuit. It's a compact microcircuit designed to control a selected operation in associate embedded system. A typical microcontroller includes a processor, memory and input/output (I/O) peripherals on centralized management, coordinated retrieval, and joint information resource exhibition Lab VIEW programming environment is developed to connect large area. The leakage level of a gas concentration.

Radio Frequency Identification(RFID)

It is a new identification technology that uses radio frequencies for identifying any object or a person. It's one major advantage is that it is wireless and no one can read the information stored in it accept for the device meant for reading it. Thus, the information is confidential. It is



generally done using a RFID tag which is a small card with an electromagnetic chip embedded over it with an antenna. All the information is stored in that chip. Generally, a RFID serial card number is used as the identification number. Each user has its unique ID number stored in that chip. A RFID system comprises of the RFID tag and the reader or the sensor. Both the card and the reader have their antenna for sending and receiving the signal. There is a specific range in which the tag works with the reader. As soon as the tag reaches the range of the reader, it gets induced and sends the information.

Fig. RFID Tag

Arduino UNO

The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The board has 14 digital I/O pins (six capable of PWM output), 6 analog I/O pins, and is programmable with the Arduino IDE (Integrated Development Environment), via a type B USB cable. It can be powered by the USB cable or by an external 9-volt battery, though it accepts voltages between 7 and 20 volts. It is similar to the Arduino Nano and Leonardo. The hardware reference design is distributed under a Creative Commons Attribution Share-Alike 2.5 license and is available on the Arduino website. Layout and production files for some versions of the hardware are also available.

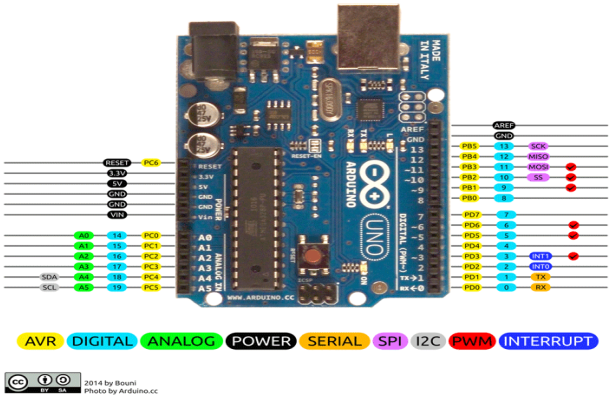


Fig. Arduino pin setup

ESP8266-01

The **ESP8266** is a very user friendly and low cost device to provide internet connectivity to your projects. The module can work both as a Access point (can create hotspot) and as a station (can connect to Wi-Fi), hence it can easily fetch data and upload it to the internet making **Internet of Things** as easy as possible. It can also fetch data from internet using API's hence your project could access any information that is available in the internet, thus making it smarter. Another exciting feature of this module is that it can be programmed using the Arduino IDE which makes it a lot more user friendly. However this version of the module has only 2 GPIO pins (you can hack it to use upto 4) so you have to use it along with another microcontroller like Arduino, else you can look onto the more standalone **ESP-12** or **ESP-32** versions. So if you are looking for a **module to get started with IOT** or to provide internet connectivity to your project then this module is the right choice for you.

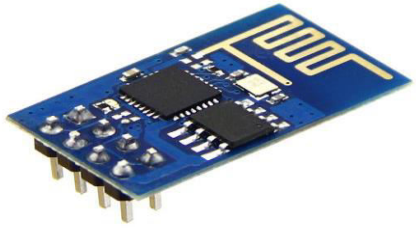


Fig. ESP8266 Wi-Fi Module

LCD 16×2?

The term LCD stands for liquid crystal display. It is one kind of electronic display module used in an extensive range of applications like various circuits & devices like mobile phones, calculators, computers, TV sets, etc. These displays are mainly preferred for multi-segment light-emitting diodes and seven segments. The main benefits of using this module are inexpensive; simply programmable, animations, and there are no limitations for displaying custom characters, special and even animations, etc.

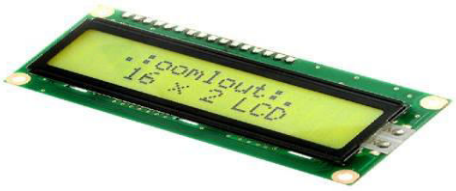


Fig. LCD 16*2 Display

IV. PROPOSED SYSTEM

1. To verify vehicles information along with owner"s detail.
2. Take challan charges easily without any paperwork.
3. Culprit confirms their challan charges throughSMS gateway.

4. All information viewed by the head of thepolice Department.

Fig. Working of Project

V. EXPECTED RESULT

It can be expected that automatic E-challan generation using RFID scanner should provide efficient system capable of conserving resources and human effort.

- The system also facilitates real-time remote monitoring of the current traffic situation.
- The system will also be able to add on additional traffic signal junctions easily.

VI. APPLICATION

- This system can be centralized and be used in all over INDIA.
- Other countries can also use this application by changing the norms accordingly.
- This Authorized website can also be used as identity proof of a person.
- Tagging different medical objects like various equipment and patients' files contribute to better health care applications.
- Other applications include RFID based library management, automatic challan system, traffic toll collections, supply chain and logistics, smarts cards, for identifying attack ranges etc.

VII. FUTURE SCOPE

This project has a great potential to automate various more aspects in transport system such as speed sensing challan, real time traffic monitoring system, illegal parking system, lane cutting at certain intervals.

The future scope of this application involves introducing RFID sensors or cameras on the roads that detect any kind of traffic rule violation like over speeding, or driving without a helmet etc and automatically generate the penalty of challan and have it delivered to the user, this would remove the middle-man, the traffic police officer from the picture thereby eliminating any chances of corruption or bribery.

VIII. CONCLUSION

Thus we conclude that in today's scenario automation in traffic system is a necessity to avoid further violation of traffic rules. It also ensures proper collection of penalties enabling a corruption free environment.

This will reduce the efforts of traffic police officers and help them focus on other violations like drunk driving, lane cutting, over speeding.

A working model of Electronic challan system using RFID reader, GSM, and microcontroller has been implemented successfully. One can explore this project with connecting Internet banking for automatic payment of challan. Also can design challan android app as alternate option. This up-routes manual challan and going on corruption since some traffic police don't pay proper amount to government. Use of this technology will become ubiquitous in coming day. And will be one of the greatest contributions to development of 21st century. And RFID technology will open new volumes in the field of security against vehicle stealing.

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