SURVEY ON ANTI CORRUPTION TRAFFIC MANAGEMENT SYSTEM

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Abstract: Present day, technology has emerged in such a way that it can provide solutions to any real-life problems but in our daily life, traffic is the major issue, parking the vehicle in no parking place is the one of the major reasons for increasing traffic. We do not have a perfect system which finds the vehicle standing in no parking place. One such solution to the problem of towing vehicles is done efficiently by using embedded systems and IoT Technology. When a vehicle is parked at NO PARKING ZONE knowingly or unknowingly the owner is punished with a penalty and a notification will be sent to the consignment officer for registering a complaint against the vehicle.

Every day public and traffic police wasting their time just for verification of documents. Helmet is mandatory but people neglect to wear the helmet, so every time traffic police must monitor this operation. Here penalty part is done manually so there may be a chance of misuse which leads into corruption. The role of traffic police is very helpful for the society. They are meant to be controlling the heavy traffic flow but, they control the drink drive, they control without helmet ride to save the lives. They always try to bring traffic awareness to the people. But unfortunately, some of our traffic police became corrupted, they always try to find different ways to hold people accountable for money in the name of traffic rules. Many time Traffic police stop us to verify our documents, so we have to carry our documents. Which is not feasible and it is also waste of time and will disrupt the traffic flow. Hence, we need a system which can overcome all the major imperfections in the present traffic control system.

Keywords: RFID, GSM, LIMIT SENSOR, IR sensor, Embedded C

I.   INTRODUCTION

According to the World Health Organization (WHO), about 1.24 million people die and 20 to 50 million are injured in traffic crashes each year. Traffic is the eighth leading cause of death on a global scale, and is expected to reach the fifth position by 2030. The WHO defined major behavioural contributors to road crashes are alcohol or sleep deprivation combined with vehicle operations, inappropriate speed, and non-use of protective equipment like seatbelts, child restraints, and helmets. A survey that has been done recently, said that nearly 70% of road accidents occur due to drunken driving, with a range of 44% to 67% in small cities. They also conveyed that overall, 56 accidents and 14 to 15 deaths occur on our roads per day due to not wearing helmets and seat belts. Traffic police is an important department within the police force all over the world. The key responsibility of the traffic police is to maintain law and order within road networks. They need to manage and control traffic.

Effective enforcement of traffic safety policies is important for traffic fatalities reduction but is often diminished by police corruption. Corruption is defined as the misuse of authority for personal advances, most common acts of corruption in traffic police are bribery and extortion. These are usually overlapping actions, representing corrupt payments either given or taken, to influence officials' operations. To overcome such problems "Anti-corrupted traffic monitoring system" is useful. Our day-to-day life in a metropolitan city is always presented with an obstacle, not financial or climate, but the kind of obstacle that can be overcome with meticulous planning and execution. Commute, which includes travel, parking and safety are three things that should be made simpler and hassle free. In a bustling city like ours, the heavy fines that are charged for breaking rules are often never tracked, making the rules in place negligible. Unauthorized stops have always been misled to breaking of rules and unnecessary fines or delays. Finding a designated area to park your vehicle has always been a task in residential areas, parking in the no parking zones can always lead to getting the vehicle towed away or a standard fine being charged for that number plate. The vehicles that are towed away have an hour-long procedure of their own to get it released from the authorities, meanwhile the authorities are not liable for the damages caused to the vehicle whilst towing it. There is no system in place that can indicate no parking zones. If only there was a system to notify us when we park the vehicle in no parking zone it would prevent the inconveniences caused whilst paying the fine or the time wasted in order to retrieve the vehicle from higher authorities.

Traffic police are usually engaged in verifying documents for vehicles on the road rather than improving or controlling a better flow of traffic. Accident zones are never monitored by traffic police, instead their work hours are spent on pulling a vehicle to the curb side and verifying their documents. Fines that are placed in such unauthorized stops are never monitored or kept an account of, which paves way for corruption and un wanted/ un lawful arguments.

The roles of a traffic police are diversified from controlling traffic, avoiding drink and drive, control of riders without helmet and so on. If only a reformed system to ensure the right parking, document verified riders, riders who'll be compelled to wear a helmet nor drink before driving and only then we will be able to solve the problem and shift the focus on traffic congestion.

In this project we will be aiming to solve these problems.

II.   LITERATURE SURVEY

There are many IEEE papers and journals are referred in the project and few of them are discussed below:

The proposed NFC (Near Field Communication) reader method is placed at a certain distance before the tollgate; the reader collects the identification number of the car and sends the data to the tollgate system. This system sends a query to the main office for the data and will retrieve back the data and valuable documents belonging to the car. If no error is found then the barrier will open otherwise barrier remains closed [1] the proposed system consists of RFID tags, RFID reader and a user interface. RFID tags attached with many different objects and RFID reader will track the respective object accordingly [2]. The authors have proposed a system to check for the drunken drive and avoid it effectively, with these emerging technologies, the automobile industry uses various sensors and controllers to provide an equipped environment. Taking advantage of this phenomenon, they have developed a mechanism for providing secured driving near the seat belt buckle. The driver is not permitted to drunken driving and without the seatbelt [3].

The following system has proposed the automatic toll collections by using the Microcontroller, RFID tags and IR sensors. When a vehicle reaches near the toll gate the fee will be automatically deducted from user account. MQ135 sensors attached inside the vehicle near the steering to check for the alcohol consumption of the driver. The load checker checks the load of the heavy vehicle, if the load exceeds the limit, then the penalty amount will be deducted for the exceeded limit and the camera captures a snap of the vehicle and automatically an e-mail alert will be sent to the consignment officer regarding the vehicle [4]. In this paper, authors have used MQ-3 gas sensor to detect the alcohol content of users. The gas sensing material used in the sensor is tin dioxide (SnO_2), which has low conductivity in clean air. Once, alcohol vapor exists in the air the conductivity of the sensor increases with the increasing concentration of alcohol [5]. The authors in this work have proposed a prototype portable alcohol detection system,

The sensor unit used in this system is capable of distinctively detecting the saturated water vapor and the metabolites from human breath while accurately measuring the alcohol level of a driver breathing into the detector. The system also displays the alcohol level measured by the detector on a smartphone and sends the data to a cloud system [6]. The work put forward here is that the GPS system will detect the exact location of vehicle with corresponding longitude and latitude, then GSM will send messages to relatives of the driver.

They have used ultrasonic sensor which sensing the limited distance from other vehicles, and then the sensors are activated and send location information messages to relatives of the vehicle [7]. The work consists of a helmet unit (HU) and a motorbike unit (MU). The HU and MU communicate via RF using the NRF24L01 Module. The helmet unit continuously monitors the pulse rate of the rider, alcohol in the breath of the rider, and vibration intensity. The ignition system of the bike is activated only when the readings of the pulse rate sensor cross the threshold. The motorbike unit has GPS and GSM modules that send messages with the position of the rider in case of a mishap [8]. The paper introduces a multi-layer security system which is a theft alerting feature, owner speed-limiting system, and emergency monitoring vehicle feature. If the vehicle is robbed, location information can be delivered to the owner from anywhere in the world.

The application of Raspberry Pi in the system gives capable and strong security to the vehicle. The use of GSM/GPS in this paper gives real-time location data of the vehicle and it can also use a camera to monitor vehicles anywhere [9]. The suggestion of this paper consists of a Fully equipped RFID based Parking System that provides solutions to various parking problems, RFID reader is placed at the entry gates and a card is given out which must be shown at the exit gates for details and the whole structures capacity and allotment is done strategically [10]. In this project paper, the smart helmet developed is in such a manner that bike does not start until and unless rider wears the helmet. Also, the bike won't start if the rider is drunk the whole project functions around Pressure sensors and Arduino, the system will make use of

different wireless communication protocols including ZigBee and another radio frequency protocols [11]. The presented vehicle identification and verification system will monitor and track the vehicle in all the conditions. The system contains a server and a display unit for reporting and displaying related events (RFID tagged vehicle details, non-RFID tagged vehicle details, STOLEN vehicle details) [12]. The system will indicate the expiry dates of all documents and sends mail to that person. And, the theft vehicle can be easily identified by the admin (police) by scanning the RFID tag of that theft vehicle during checking [13].

These systems allow a very high storage efficiency in surface and volume and is very quick as the time required for accessing a car is low and the parking system requires a working mechanism that can operate the system. In addition to this, a detection system is required to help the person know whether there is an availability of a free parking spot. The need to consider the safety of cars and humans alike when designing this system. In this paper, the different types of parking systems and various kinds of sensors used to increase safety and efficiency are discussed [14]. In the ITS context, intelligent speed advisory/assistance for on road passenger vehicles has been a research subject for a long time. This research has analyzed recent studies on intelligent speed assistance approaches that overcome adverse environmental and road safety problems.

Furthermore, it is interesting to summarize these techniques and analysis of the outcomes and objectives achieved. By doing this research, an inclusive comprehension of the vehicle speed assistance systems, the open issues of this field, related challenges, and future directions were obtained [15]. The work was aimed at proposing efficient, fast, simple and hardware friendly vehicle Number plate recognition system.

The two modules of the project namely (i) number plate recognition system (NPRS) (ii) Radio Frequency Identification (RFID) have been individually gathered. Both the modules working parallel. Due to its expansive application area, both academic and commercial world's number plate recognition systems have received more attention. Induced in an authentic time NPRS implementation techniques and algorithms for exploring possible. Relatives are different ways to achieve results even if, at the time of execution of the selection algorithm plays a supreme role [16]. In this system, they examined the sources for RFID's complexity, described the need for a whole- tic security model and emphasized the increasing dynamics in RFID research. Furthermore, they highlighted the different perceptions by RFID users, researchers and vendors and showed the current development streams in RFID research starting from the commonly accepted fact that the current generation of RFID tags cannot execute conventional cryptography [17].

The Various benefits of RFID applications have been identified. RFID technology supports tracking of library materials, reduces threats to the library collection, improves accuracy of data collection, and reduces the amount of time required to perform the circulation operations of check-in, check-out, inventory control and shelf-management. Information can be read from RFID tags more quickly than from bar codes and several items in a stack can be read at the same time. RFID systems also have a security function to detect theft. RFID technology is revolutionizing library operations and services. The library also presents unique challenges for RFID adoption, including technological constraints, cost concerns and privacy concerns [18]. Requirement of the smart parking system will increase drastically in the upcoming years. However, the smart parking systems already exists in many cities, proposed system is targeted at making this system more cost-effective and user- friendly. This system was successfully tested and had 90% accuracy.

The web application is user friendly. Future works will extend the system to work with other different technologies. They conclude there are some categories such as parking zone, NO parking zone and unknown place. For that they built a hardware which executes operations so the system give alert only when vehicle is in NO parking area [19]. They have provided a very effective solution to develop an intelligent system for vehicles for alcohol detection whose core is Arduino. Since sensor has fine sensitivity range around 2 meters, it can suit to any vehicle and can easily be hidden from the suspects. The whole system has also an advantage of small volume and more reliability [20].

III.   METHODOLOGY

3.1   BLOCK DIAGRAM:
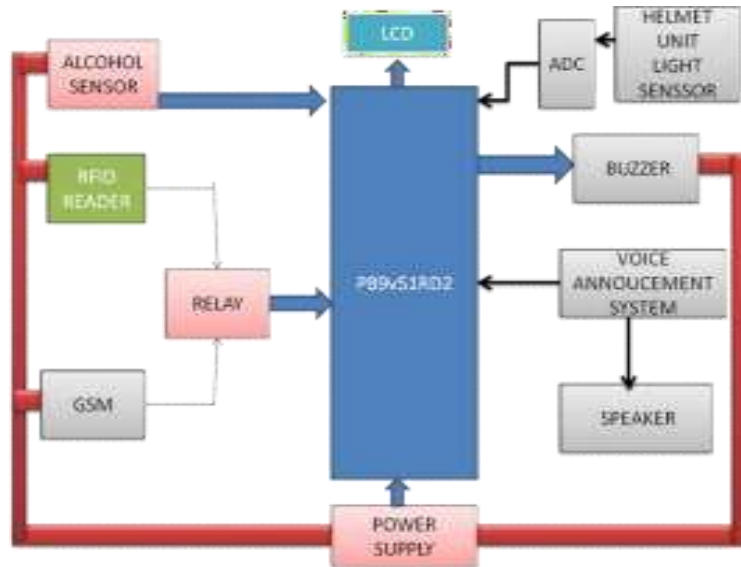
The P89V51RD2 is an 80C51 microcontroller with 16/32/64 kB flash and1024 B of data RAM.A key feature of the P89V51RB2/RC2/RD2 is its X2 mode option. The design engineer can choose to run the application with the conventional 80C51 clock rate (12 clocks perm a chine cycle) or select the X2 mode (six clocks per machine cycle) to achieve twice the throughput at the same clock frequency. Another way to benefit from this feature is to keep the same performance by reducing the clock frequency by half, thus dramatically reducing the EMI.

The flash program memory supports both parallel programming and in serial ISP. Parallel programming mode offers gang-programming at high speed, reducing programming costs and time to market. ISP allows a device to be reprogrammed in the end product under software control. The capability to field/update the application firmware makes a wide range of applications possible. The P89V51RD2 is also capable of IAP, allowing the flash program memory to be reconfigured even while the application is running.

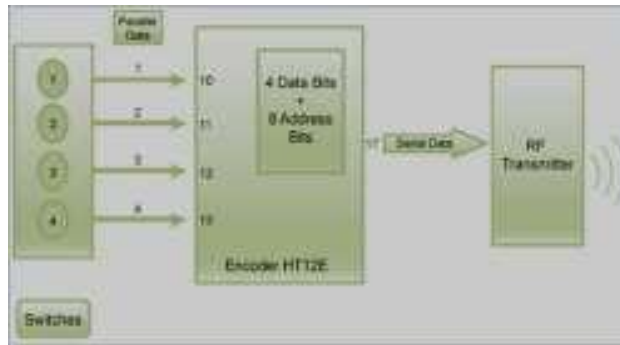Fig 3.1.1. typical microcontroller kit

Fig 3.1.2 shows Block diagram of RF transmitter

| PIN NO	SIGNAL	DESCRIPTION
Pin no. 4	Data high (JP4)	It will give data high signal
Pin no. 6	TxD	Transmit data (TTL level) o/p from module to serial interface
Pin no.8	RxD	Receive data (TTL level) i/p to module from serial interface
Pin no. 12	Buzzer (active low)	Buzzer will buzz for 280ms when tag is detected
Pin no. 13	LED (active low)	LED will glow for 280ms when tag is detected
Pin no. 14	Data low (JP4)	It will give data low signal
Pin no. 27&28	Antenna i/p (JP5)	Loop antenna should be connected

3.2 THE WORKING OF RFID:
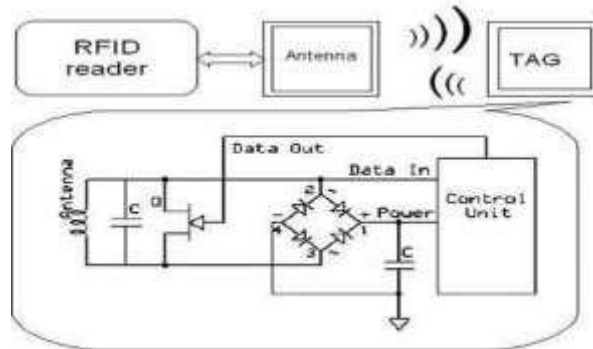
Fig 3.2.1: Working Of RFID

RFID is so called Radio Frequency Identification system which consists of two main parts: transmitter and receiver. The labels, access cards and even passports in some countries they have RFID transponders integrated. These transponders are called "tags". The user can store RFID card/tag details in the module memory. When the user shows the card, the ID is read and compared with the stored card memory. When there is a match, the unit activates a relay provided on the baseboard. This relay when connected to the Door Closure mechanism can open for a certain period for the person to enter after which it closes the door once again. If the RFID card shown does not match with the stored database, then the door remains closed. Facility has been provided to add and delete the card numbers using a Master Card. Beep and LED are provided for Audio and Visual indication of various conditions.

3.3 MAX232:

This module is primary of interest for people building their own electronics with an RS-232 interface. Off-the-shelf computers with RS-232 interfaces already contain the necessary electronics, and there is no need to add the circuitry as described here.

Serial RS-232 communication works with voltages (-15V to -3V for high) and (+3V to +15V for low) which are not compatible with normal computer logic voltages. On the other hand, classic TTL computer logic operates between 0V to +15V. So, the maximum RS-232 signal levels are far too high for computer logic electronics and the negative RS- 232 voltage for high can't be rocked at all by computer logic. Therefore, to receive serial data from an RS-232 interface the voltage has to be reduced and the low and high voltage level inverted. In the other direction (sending data from some logic over RS-232) the low logic voltage has to be "bumped up" and a negative voltage has to be generated.

RS-232   TTL   Logic

-15V … -3V <-> +2V … +5V <-> high
+3V … +15V<-> 0V … +0.8V <-> low

3.4 RS-232:

RS-232 is the mostly widely used interfacing standard. This standard is used in PCs and numerous types of equipment's. However, since the standard was set long before the advent of the TTL logic family. Its input and output levels are not TTL compatible. In RS-232, a1 is represented by -3 to -25 volts while a 0 bit is represented by +3 to +25 volts, making 3 to +3 undefined. For this reason, to connect any RS-232 to a microcontroller system we must use voltage converter such as MAX232 to convert the TTL logic levels to the RS-232 voltage level and vice-versa.

3.5 GSM MODEM:

Global System for Mobile Communications (GSM)—A digital, mobile, radio standard developed for mobile, wireless, voice communications in the early 1980s, many countries in Europe witnessed a rapid expansion of analog cellular telephone systems. However, each country developed its own system, and interoperability across borders became a limiting factor.

The GSM group proposed the following criteria for the new mobile wireless system:
- Good speech quality
- Low cost for terminals and service.
- International roaming.
- Handheld terminals.
- Support for introduction new services.
- Spectral efficiency.
- Compatibility with Integrated Digital Service Network (ISDN).

Fig 3.5.1 GSM module

3.6   WORKING:

RFID reader and GSM is interfaced with micro controller and fixed at every NO PARKING ZONE
- Every vehicle has its own RFID tag.
- If anybody trying to park the vehicle in NO PARKING ZONE voice announcement will come as "this is not a parking zone please do not park your vehicle". The announcement will repeat for 3-4 times. If vehicle is not move from that zone automatically warning message will go to owner cell number.
- Buzzer also indicates that it is not a parking zone.
- After some duration if he will not vacant the vehicle from the zone then system will send the penalty message to the owner number and also store the penalty information to traffic control room data base.
- User has to pay the penalty in the court
- Alcohol sensor senses the alcohol content, if it is high then it sends the message to the owner with penalty.
- In the helmet, we have placed limit switches which will decide whether rider has worn the helmet or not
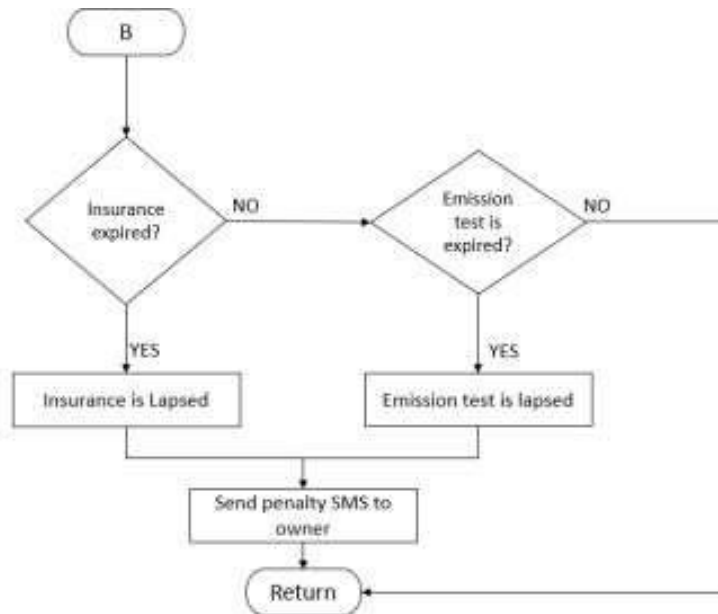- Document verification is done through RFID reader.
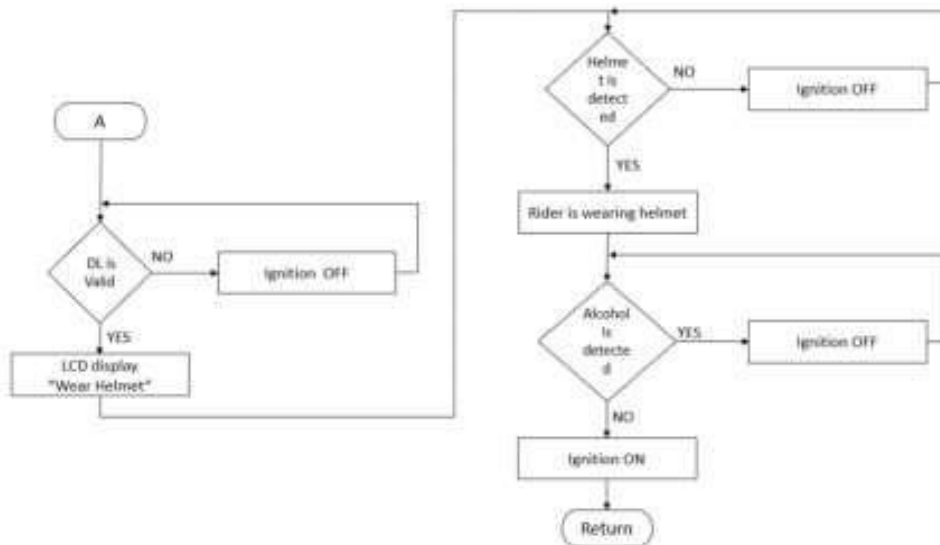
Fig 3.6.1 Document Verification

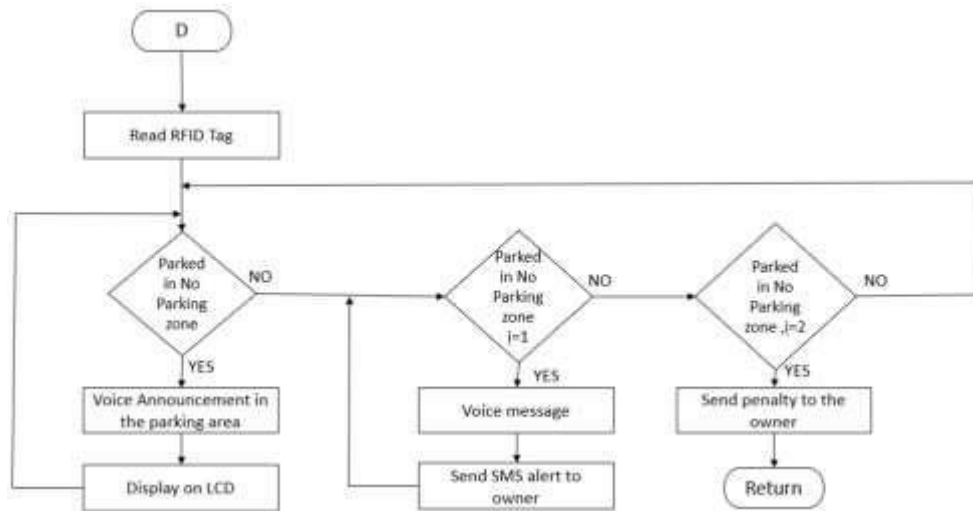Fig 3.6.2 Helmet and Alcohol Detection
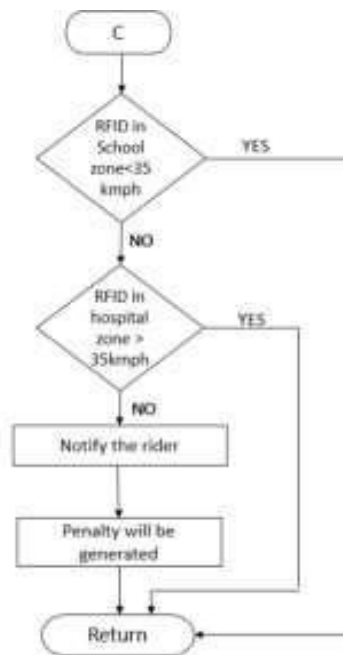
Fig 3.6.3 No Parking Indication

Fig 3.6.4 Speed Control

IV.   RESULT

- Detect vehicles in the no parking zone.
- Detect the alcohol content.
- Dc motors are operated according to the command.
- Verify the documents and send massages.
- Detect the presence or absence of helmet.
- Voice announcement system worked successfully by activating it.

Fig 4.1 No parking zone

Fig 4.2 School Zone

Fig 4.3 Alcohol Detection

Fig 4.4 Messages

V.   CONCLUSION

- In our daily life traffic is the major issue, parking the vehicle in no parking place is the one of the major reasons for increasing traffic. We do not have a perfect system which finds the vehicle standing in no parking place as well as the correct document verification. So many times, knowingly or unknowingly we park our vehicle In NO PARKING ZONE and for documents will be punished or paid penalty.
- After surveying all these difficulties in traffic system, we come up with this project **"ANTICORRUPTION TRAFFIC MANAGEMENT SYSTEM"**
- By this system we can create awareness of traffic rules to the people and can also reduce the corruption or may say corruption free system ,with the use of this system we can save the time of the vehicle owner as well as the traffic police.
- Here all above operations are done through electronic system. it will be very convenient, safety and corruption free system.

.REFERENCES

[1] Near Field Communication (NFC) based Electronic Toll Collection System, Nikhil Mohan O.K, Savita Patil International Journal of Recent Advances in Engineering & Technology (IJRAET) ISSN (Online): 2347 - 2812, Volume-2, Issue - 4, 2014

[2] Radio Frequency Identification (RFID) Misplaced Objects, Madhura J Bonde and Kantilal P Rane Godavari College of Engineering, Jalgaon, Maharashtra 2014: International Journal of Electronic and Electrical Engineering. ISSN 0974-2174 Volume 7, Number 7 (2014), pp. 657-662 © International Research Publication House http://www.irphouse.com

[3] Ms.M.Malathi, Ms.R.Sujitha, Ms.M.R.Revathy, "Alcohol Detection and Seat Belt Control System using Arduino" International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN: 2278-3075 (Online), Volume-9 Issue-6, April 2020

[4] A. Kumar, N. Anusha and B. S. S. V. Prasad, "Automatic toll payment, alcohol detection, load and vehicle information using Internet of things & mailing system," 2017 International Conference on Intelligent Computing and Control (I2C2), 2017, pp. 1-5, doi: 10.1109/I2C2.2017.8321775.

[5] W. Wu and Z. Li, "Design of Multifunctional Bracelet Detecting Alcohol," 2019 IEEE 4th Advanced Information Technology, Electronic and Automation Control Conference (IAEAC), 2019, pp. 2342-2345, doi: 10.1109/IAEAC47372.2019.8998033.

[6] H. Wakana and M. Yamada, "Portable Alcohol Detection System for Driver Monitoring," 2019 IEEE SENSORS, 2019, pp. 1-4, doi: 10.1109/SENSORS43011.2019.8956885.

[7] Vijay Savania, Hardik Agravata and Dhrumil Patela "Alcohol Detection and Accident Prevention of Vehicle" - International Journal of Innovative and Emerging Research in Engineering Volume 2, Issue 3, 2015.

[8]] Pranav Pathak "Smart Helmet with Motorbike unit for Accident and Rash Driving Detection" 2020 IEEE International Conference on Advances and Developments in Electrical and Electronics Engineering (ICADEE 2020)

[9] T. Aziz, T. M. Faisal, H. -G. Ryu and M. N. Hossain, "Vehicle Speed Control and Security System," 2021 International Conference on Electronics, Information, and Communication (ICEIC), 2021, pp. 1-4, doi: 10.1109/ICEIC51217.2021.9369808.

[10] Ankita Gupta, Ankit Srivastava, Rohit Anand, Paras Chawla "Smart Vehicle Parking Monitoring System using RFID" International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN: 2278-3075, Volume-8, Issue-9S, July 2019

[11] Suvarna S Patil1, Shravani Kolur2, Seresha VB3, AP Sushma " Smart helmet with Sensors using Arduino" International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering (IJAREEIE)
| e-ISSN: 2278 – 8875, p-ISSN: 2320 – 3765| www.ijareeie.com | Impact Factor: 7.122|Volume 9, Issue 7, July 2020

[12] Alen Joseph Samuel, Shoney Sebastian "An algorithm for IoT based vehicle verification system using RFID" International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering (IJAREEIE)
| e-ISSN: 2278 – 8875, p-ISSN: 2320 – 3765| www.ijareeie.com | Impact Factor: 7.122|Volume 9, Issue 7, July 2020

[13] C.Thirumarai Selvi , Amruthamathi. A, Motheswar.N.M, Surabhi. P.S "Smart Authentication of Documents Using RFID and Fingerprint Modules" 7th International Conference on Advanced Computing and Communication Systems (ICACCS) 021 IEEE | DOI: 10.1109/ICACCS51430.2021.9441851

[14] Ahmed Shah , Dev Shah, Ajit Satpute, Mihir Shinde, Sunil Shinde " Literature Review on Parking System " International Journal of Engineering Research & Technology (IJERT) http://www.ijert.org ISSN: 2278-0181 Vol. 10 Issue 10, October-2021

[15] Mehrdad Asadi, Mahmood Fathy, Hamidreza Mahini, Amir Masoud Rahmani "A systematic literature review of vehicle speed assistance in intelligent transportation system" IET Intelligent Transport Systems March 2021 DOI: 10.1049/itr2.12077

[16] AQIB MEHMOOD1, MUMTAZ ALI2, RAMEEZ AHMAD1, SAYED IRFAN1, HABIB UR RAHMAN " IDENTIFICATION AND VERIFICATION OF VEHICLE USING RFID TECHNIQUE" VAWKUM Transactions on Computer Sciences http://vfast.org/journals/index.php/VTCS@ 2016, ISSN(e):2308-8168, ISSN(p): 2411-6335 Volume 10, Number 2, July-August, 2016

[17] Bernhard Riedl , Gernot Goluch , Stefan Pöchlinger , Edgar Weippl "A Comparative Literature Review on RFID Security and Privacy" Information & Software Engineering Group, Vienna University of Technology 2018 weippl@ifs.tuwien.ac.at

[18] Yusof, Mohd Kamir; Saman, Md Yazid "The adoption and implementation of RFID : a literature survey" Library and Information Science Research E-Journal,2016 IBRES volume 26, issue 1, pages 31-52 (2016)

[19] Vaibhav B. Mandlik, Vaishnavi M. Kulkarni, Aakash L. Rathod, Kalyani H. Dhake " Detection and Identification of Vehicle's No-Parking Area using IoT and Cloud" International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056 Volume: 07 Issue: 05 | May 2020 www.irjet.net p-ISSN: 2395-0072

[20] Pranjali Ingalepatil, Priyanka Barhate, Bhagyashri Nemade, Vijay D. Chaudhari "Alcohol Detection System in Vehicle Using Arduino" International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395 0056 Volume: 04 Issue: 06 | June -2017 www.irjet.net p-ISSN: 2395-0072