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Smart System for Corruption Avoidance and Owner Assistance Using RFID A Step Towards Digital India

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Abstract: ***In this paper we are proposing a solutions to some of the major challenges related to corruption avoidance and also for the owner assistance. In present scenario there are several major problems related to vehicles such as corruption regarding the fine raised, Petrol bunk frauds, vehicle theft and Ambulance that has been stucked in the signal these are the common problems that we see in our day to day life. So keeping this Idea in our mind, we are designing a solution for it and also this is a step towards Digital India. Here we have use ARM7 microcontroller for implementing the system along with several components such as RFID it is one of the important step towards the digitalization where it contains all the information about the vehicle, sensor for the track the level of fuel that has been filled, GSM and GPS modules which is necessary of the assistance of the owner in tracking and sending message to the owner, so by this the owner of the vehicle can get the complete information even if he is not present at that particular point and also for reducing the corruption to some extent by implementing this proposed system which is a step towards digitalization.***
Keywords: ***ARM7 microcontroller, RFID, GPS, GSM, Corruption avoidance, Owner assistance.***

I. INTRODUCTION

One of the key drivers of Indian economy is the automobile industries; there are different types of vehicles that are produced in India, such as Passenger Vehicles and Commercial Vehicles. Today, India is the one of the largest producers of automobiles in the world. Although there are certain steps that has been taken care about the safety precautions yet there has to be measures that has to be taken care off. In the previous couple of years petrol bunk frauds and debasements have expanded immensely. The vehicle volume has likewise expanded exponentially, despite the fact that distinctive advances are there to recognize petroleum bunk cheats and debasement yet these innovations have a few downsides, such as installation problems, complexity cost, and so on. So In an endeavor to lessen the issues identified with petrol bunk frauds and improve the traffic discipline, advanced technological solutions have been proposed in this paper. And furthermore this venture is a stage towards Digital India. In this we are expecting to give a framework, which will persistently screen the vehicles in certain zones using RFID reader the vehicle has to be fitted with the RFID tag and consequently cause punishment for encroachment of any of the rules. If a driver disrupts rules particularly the documents of vehicles, the driver will be charged by the guidelines. The RFID will have a unique number that is fixed in each and every vehicle that has all the details about the vehicle such as Driving license, details of RC book, Insurance details will be stored in the RFID tag that is in the vehicle, so by this there is certainly no impulse that the driver has to carry the documents each and every time whenever he travels. Thus in this project we are minimizing some extent of corruption in the traffic, identification of the stolen vehicle, limiting the petrol bunk frauds and furthermore giving priority to the emergency vehicle by changing the signal light. The department of heavy industries is considering a tender to make it compulsory to fit RFID devices in the cars that is being manufactured in India. By implementing this RFID tags it will help to monitor the traffic violation and there are many such uses. And also penalty can be incurred for the violations. But here we are trying to incur penalty for certain traffic rule violations.

II. LITERATURE SURVEY

Authors of the paper [1], describes the low cost solution for indicating the availability of the fuel in the tank, and suggests about the digital sensing technology by using the microcontroller. Authors in the paper [2] tells about tracking of vehicle theft and locking of the car by sending a short message to the microcontroller when the theft is identified. So that the control signals of the microcontroller will lock the engine of the car so it cannot be ignited till the owner enters the password. In this paper [3] authors describes about the penalty charging during the rules violation only in the specified zones. Authors in the paper [4] describe about the stolen vehicle detection and ambulance clearance, when the ambulance is found in the traffic with the help of zigbee the signal

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light will be changed. The paper [5] describes about the low cost solution of the petrol bunk frauds. Authors of the paper [6] describes about the indication of the fuel and also it gives the solutions of overcoming the problems that was faced by the gauges that had been used earlier in the fuel detection. Here it tries to give the low cost solution and the details about the filled fuel has been indicated on the display unit that has been fitted in the vehicle and also here the author describes about the regular maintenance of the system and also about the proper setup inside the fuel tank.

III. METHODOLOGY

This system can be divided into two parts. The vehicle unit and the signal pole unit. The vehicle unit consists of a GSM, GPS, RFID tag and sensor and in the signal pole unit it contain controller unit with the RFID reader to scan the tag at certain zones, and a relay unit that is used to switch the signal light during the arrival of the emergency vehicle.

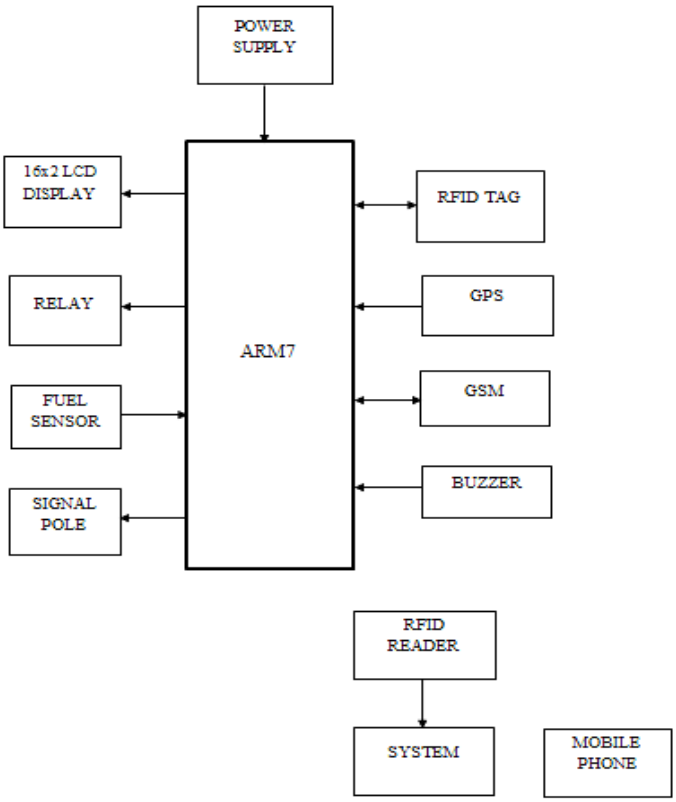


Fig.1. Block diagram of proposed system

On the other hand when the penalty is raised it gets updated into the database for that particular ID number. With the help of latitude and longitude values we can see the vehicle location in maps. ARM7 is the main control unit of the entire system, the actions that are being performed will be displayed on the 16*2 LCD screen, relay is used for switching the signal light when it detects the emergency vehicle. The fuel senor is fixed in the fuel tank of all the vehicles so that it can monitor the fuel has been filled in the tank. There are different zones in which the vehicles are tracked like tolls, signals, petrol bunks, etc. here in the signal pole there will be the RFID reader that scans and proceeds with the further actions. RFID tag it has a unique number that is been allotted to each and every vehicles and the details about the vehicle will be stored in it so there is no need of carrying the original documents each and every time of travel. Global Positioning System (GPS) it is used to find the exact location of the vehicle especially when it come to the zones, it provides the latitude and longitude values of the vehicle so that we can get an accurate place of the stole vehicle. Global System for Mobile Communications (GSM) it is used to send the short message to the concerned persons about the vehicle. Buzzer is used to indicate the stolen vehicle that is been caught in the zones. on the other hand all the details about the document expiry and the penalty raised will be updated into the database for that particular unique number and also there will be a short message to the owner regarding the same.

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A. The components that are used in the proposed system is

1) ARM 7
2) Relay
3) Fuel sensor
4) RFID Tag and reader
5) GPS
6) GSM
7) Buzzer
8) Power supply

IV. FLOW DIAGRAMS

The flow diagram of the complete system is as follows. Here it gives the complete details of the proposed system.

A. Flow diagram to indicate the amount of fuel filled

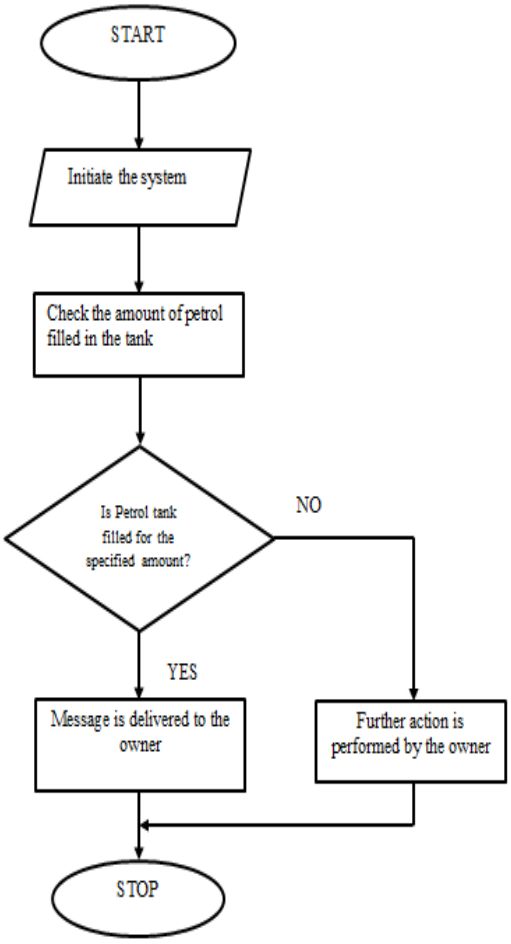


Fig.2a. flow diagram to indicate the amount of fuel filled

Dump the code to the venture module from the KEIL tool and Initialize the system, Check the amount of fuel filled in the tank. When the fuel is filled for the desired amount the message will be delivered to the owner regarding the total number of liters the fuel filled for and the amount that it has been filled in the tank. So by this we can avoid the petrol bunk frauds. By this there will not be any chances of cheating the owners by the petrol bunk staffs by altering the petrol flow or drivers cannot cheat the owner of the vehicle about this. If in that case further actions is taken by the owners.

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B. flow diagram to check document expiry

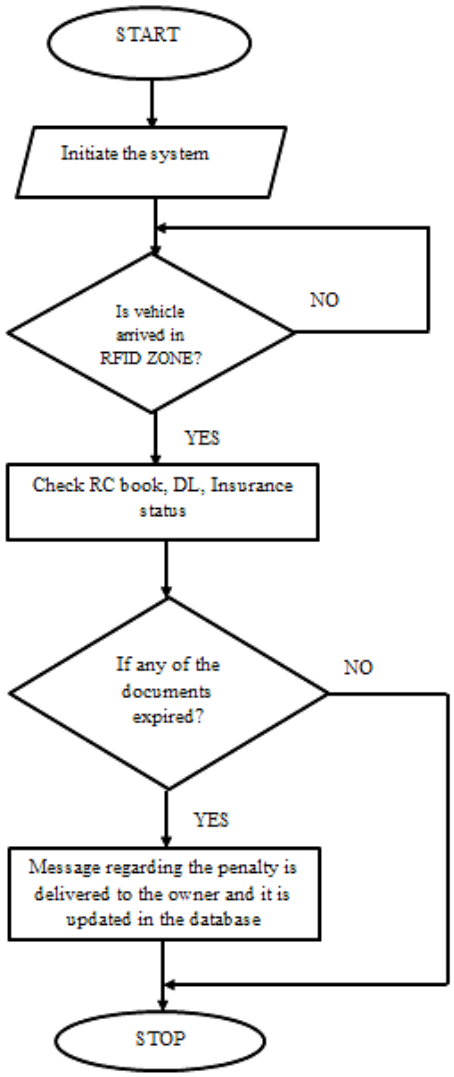


Fig.2b. flow diagram to check the documents expiry

The system is initialized and here it checks has the vehicles is in the zone or not. Zone is nothing but the RFID reader zone where it is fixed in the major places like the tolls, petrol bunks, signals etc. when the vehicle enters into the zone the RFID reader will scan the tags of the vehicles in that particular zone if there is any expiry of any one of the document then immediately there will be the penalty that is been raised for that particular tag number or the unique that is in the vehicle. There will be a short message that is sent to the owner regarding the penalty and immediately it will be updated in the database that is the central server. The concerned person should clear the penalty within the certain duration.

C. flow diagram for stolen vehicle detection

The diagram fig 2c indicates the stolen vehicle detection, initially the system is initialized, when the vehicle is stolen the owner has to register a complaint about it just by giving a unique identification number, when the complaint is registered it is updated into all the databases and the same information about the unique number is sent to all the zones when the stolen vehicle enters into the zones the RFID reader will scan it and immediately the message will be delivered to the concerned person along with the latitude and the longitude values and there will be buzzer on indicating the stolen vehicle present.

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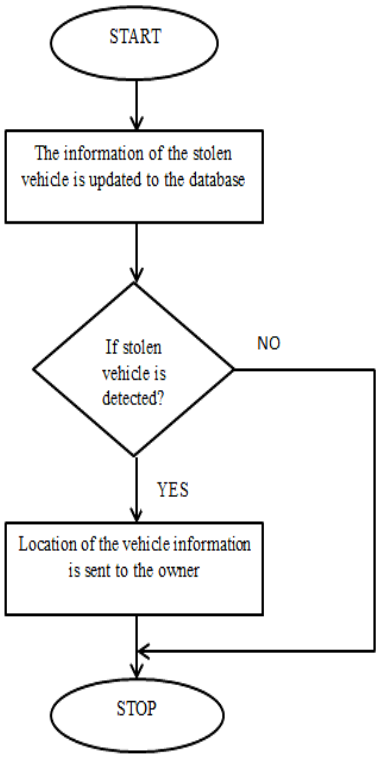


Fig.2c. flow diagram for stolen vehicle detection

D. Advantages

1) GPS module provides high accuracy.
2) Low power consumption
3) It will help to find out the exact location of the vehicle.
4) reduce mortality rates to some extent
5) Low cost solution and easy to installable in any type of vehicle.

V. RESULTS

Below are the results that are obtained and the actions that is being performed by the system

A. When the system gets on it gives a welcome message as by showing welcome to corruption avoidance and owner assistance system



Fig .3. welcome message initially

B. WHEN THE AMBULANCE ARRIVED AND WHEN THE RFID READER DETECTS THE UNIQUE NUMBER OF THE EMERGENCY VEHICLE AND IT SWITCHES THE SIGNALS



Fig .4. changing of signal during the ambulance

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C. THIS IDICATES THE VEHICLES THAT HAS NO PENALTY

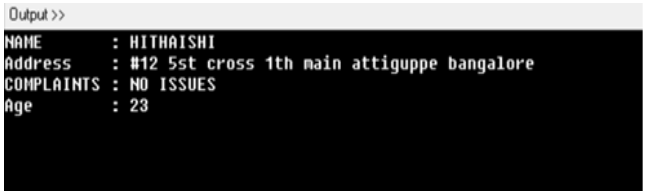


Fig .5. message with no issues

D. THIS SCREENSHOTS SHOWS THAT THE VEHICLE THAT IS RAISED WITH THE PENALTY AND THE MESSAGE THAT IS BEEN DELIVERED TO THE OWNER OF THAT PARTICULAR TAG NUMBER

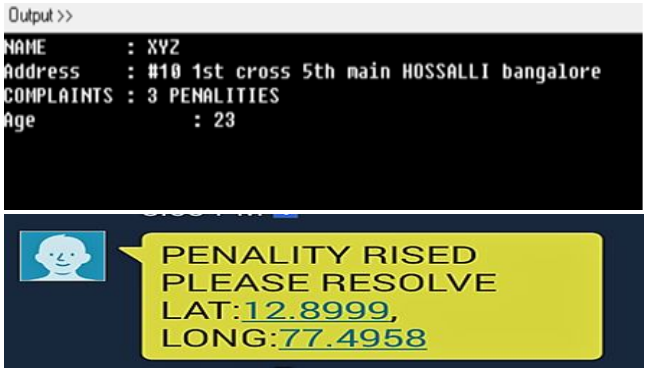


Fig .6. message with issues

E. THIS SCREEN SHOTS SHOWS WHEN THE COMPLAINT IS RAISED FOR THE STOLE VEHICLE BY ITS UNIQUE ID



Fig .7. complaint registered for that particular number

F. THIS SCREEN SHOTS SHOWS WHEN THE STOLEN VEHICLE DETECTED ALONG WITH THE LATITUDE AND THE LONGITUDE OF THE VEHICLE

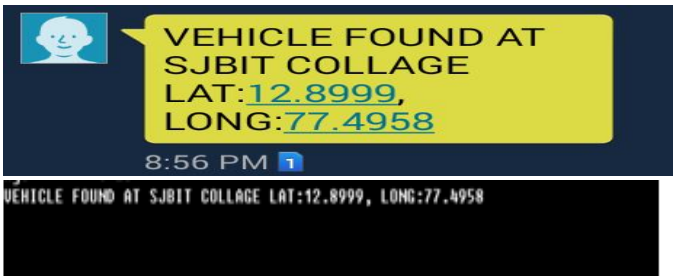


Fig .8. stolen vehicle found in the particular location

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G. THE BELOW INDICATES THE PENALTY THAT I BEEN RAISED FOR THAT PARTICULAR ID REGARDING THE AMOUNT AND THE DATE

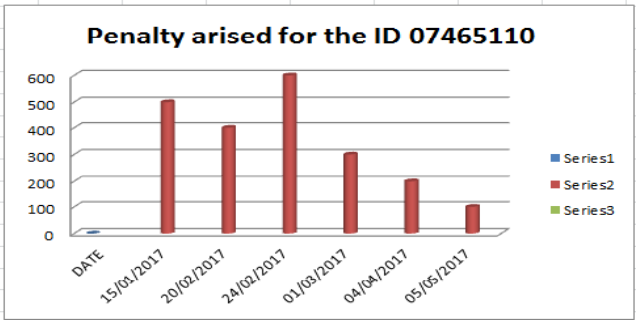


Fig .9. penalty raised for the unique ID

VI. CONCLUSION

Here the proposed system gives a solution for the corruption avoidance and also for the owner assistance it is a step towards "Digital India" where all the information of the vehicle will be stored in the tag and the penalty will be launched and updated immediately. Petrol bunks frauds are avoided completely also the stole vehicle is detected in the zones and the change in the signal when the ambulance arrives just by the unique number.

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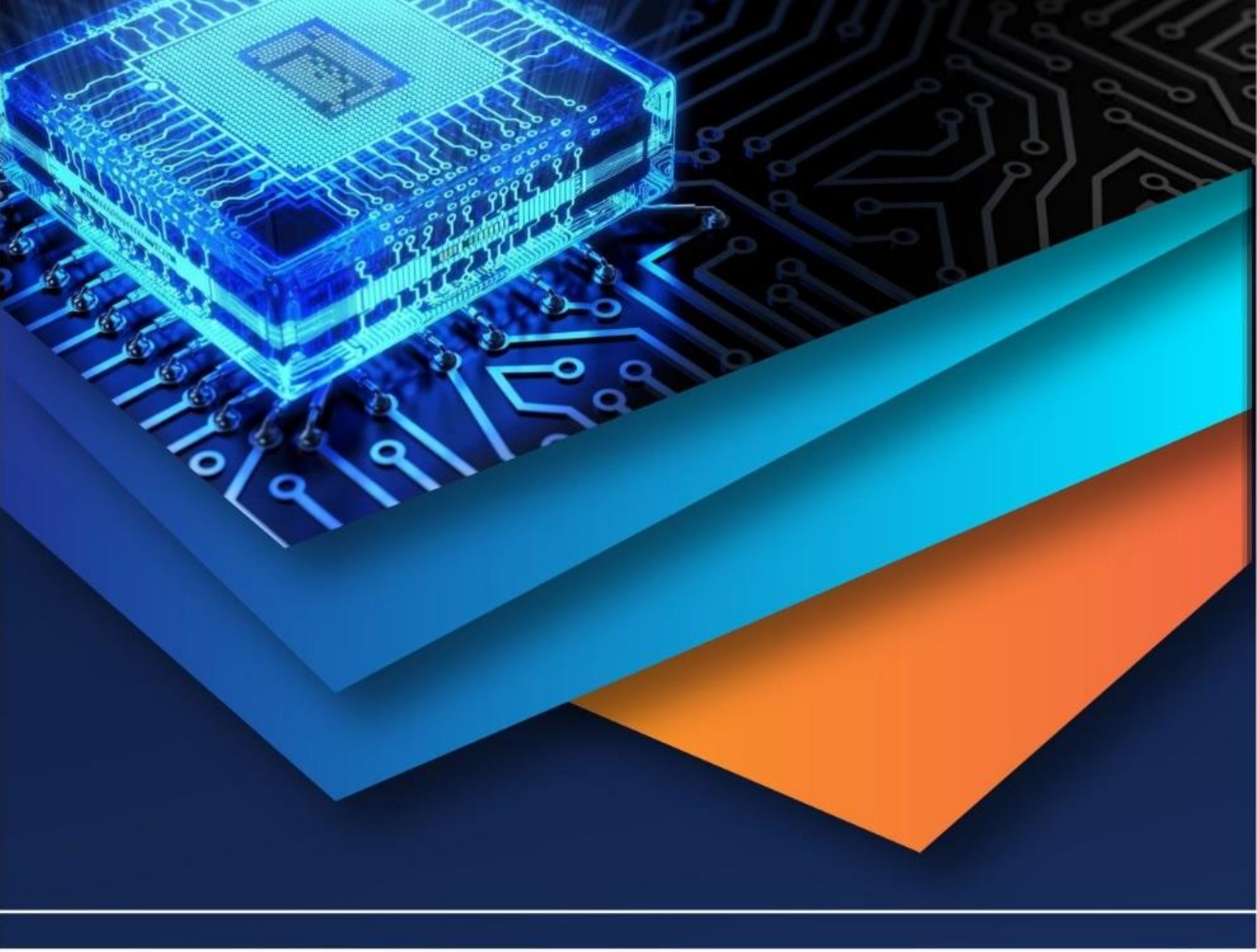
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