ABSTRACT: Traffic management is difficult in the modern cities as well as rural areas due to the improvement in technologies. During the past few years, the traffic cop has to monitor the people who all have crossed the zebra crossing before red signal is Turned Off and those who do not follow the traffic rules, the cop have to follow and chase the person for violation of rules and fine amount will be retrieved from the person. However, this system is not efficient and time consuming monitoring the people. This paper describes about Tracking the Traffic Violation using QR Reader. The main objective of this paper is to fix RFID tags on every vehicle at the time of manufacturing and RFID Reader is placed in every signal, the person who does not follow the rules will be tracked immediately and will be encountered for punishment. The person's details will be stored in the database and one who breaks the traffic rule will be tracked and caught using RFID tags. The fine payment can be done in online through Android mobile where it contains a QR reader to read the QR code in mobile. The admin is responsible for issuing the Aadhar card. Aadhar card is the card which contains the complete details of the person. The URL of the developed application is embedded into the Aadhar card.

KEYWORDS: Traffic violation, Aadhar card, RFID tag, QR reader.

I. INTRODUCTION: The aim of this system is to track the vehicle that violates the traffic rules. The vehicles can be identified using RFID reader. The fine payment can be done in online through Android mobile where it contains a QR reader to read the QR code in mobile.[1] The scope of the system is to control, the violation of traffic rules and to reduce the workload of the cop even fine payment and bill settlements can be done easily with the help of mobile which has a QR Reader and a camera in it. This system is used to create the social group and identify the person those who violate the traffic rules and regulations. Here, Breadth first search (BFS) algorithm is used for handling the database, which is less in time complexity while accessing the data from the database.

In 2003, Wal-Mart first used Radio Frequency Identification (RFID) for managing the supply chain. US Department Of Defense may also use the similar RFID for its suppliers in 2004. The RFID market is a growing one so today the use of RFID has become widespread in various fields such as education for monitoring student, travelling for monitoring passengers, automobile for monitoring vehicles, supermarket for monitoring stationeries, hospital for tracking the patient, etc.[2] RFID reader can monitor a thing with RFID tag at a distance of Seventeen feet travelling up to a speed of 160 kmph.[3]

RFID tags are of two types. They are Active RFID Tag and Passive RFID Tag. In this paper Active RFID tag is used. Active tags typically have a much longer range (approximately 300 feet) and larger memories than passive tags, as well as the ability to store additional information sent by the transceiver. Due to the rapid and fast development in the World economy, we use barcode technology for all trades and professions. QR Code is a type of two dimensional barcode. It is widely used because of its high capacity, high stability and error correction capability than the one dimensional barcode.
The QR Code can be easily generated by the user and can also be decoded easily by open software. The main four phases of the document are:

1. RFID Tracking.
2. Embedding QR Code.
3. Application Development.
4. Database Handling.

1.1 RFID TRACKING: The tag is pasted or fitted in the vehicle. The RFID Reader reads the data from the RFID Tagged object and sends the data to the database for retrieving the complete details about the person. RFID is a technology for realizing the environment and also used to identify the object. The RFID Tag consists of Antenna, transceiver and integrated circuit with memory.[4,5] Each Tag has a unique code that is unique for the whole database. The integrated circuit fixed in the tag is used to modulate/demodulate the radio frequency signal and processing information, etc. The antenna in RFID Tag is used for transmitting and receiving the radio signal within the reachable range. The data to be stored in the tag may also vary from 32 Bytes to 1 Mega Byte but the range depends upon the type and design of the tag to be used. The Reader generates high frequency electromagnetic signal and query signal which triggers the tag to reply the query and the reader can integrate with an AP in wired or wireless form.

1.2 EMBEDDING QR CODE: The URL of the Developed Application will be embedded in the QR code.[2] The code will be read with the help of QR Reader. QR Code is a two dimensional barcode, which is represented by alternate black and white pixels. Each QR Code is composed of coding region and many functional groups. The coding region of the QR Code is described by some characters, which indicate the data, version and format etc. The functional region of the QR Code is the combination of localization graph, correcting graph, separator and some graph which is not used for encoding the data.

1.3 APPLICATION DEVELOPMENT: An application is developed for fine payment and bill payment. It sends a message to the user for payment of fines. Aadhar card is a card which contains the complete details of the person, which is provided by the Government of India. We embed a QR Code into the Aadhar card for online mobile payment. QR Reader is installed or downloaded into the mobile for processing the QR Code image in the Aadhar card. After processing the image it directs you to the website for paying the fine through mobile. There is a website for providing the Aadhar card which gets the username and password from the user and if the user is a new user it allows them to register into the Aadhar card, if they are an old user it allows them to pay the fine through online. A person one who violates the traffic rule can pay the fine through this website and we can also pay electricity bill, telephone bill etc.

1.4 DATABASE HANDLING: Storing and retrieving of data will be done using the database. In this paper Breadth-First Search (BFS) algorithm is used for handling the Database. Breadth First Search is a great algorithm for retrieving the data faster from the database. Breadth First Search by the name itself suggests that the breadth of the search tree is expanded fully before going to the next step. So that the data we need is easily accessed from the database. BFS is more efficient when compared to Depth First Search (DFS). So, we implement BFS algorithm here to
search and identify the person in a step by step way or in a sequence to find the people through state, city, area, Panchayat, Taluk, etc. The working order of the nodes in the BFS tree structure is it goes from root till the child nodes traversing from left to right manner.

2. GENERAL DESCRIPTION: The general factors that affect product and its requirements provide a clear understanding of the product functions, constraints and assumptions and dependencies.

2.1 PRODUCT FUNCTIONS: The function of the reader is just tracking the RFID Tagged object, but the special thing of the device is it has the tendency to read many objects at a time but storing the details into the database by one by one. Cache is a temporary storage memory location which accesses the data faster than the main memory. By using cache memory we can save time and space.

2.2 LOGIN: To access the Tracking the Traffic Violation System, the operator or the admin have to login to the system identifying themselves with the user name and password. The admin need not register to gain authority to access the system. The admin is provided with a username and password depending on their status, which they can use to automatically login to the system. Once the user has successfully logged into the system using the username and password, the options are available depending on his type. The admin can view the vehicle number that violated the traffic with the time of the violation.

2.3 MAIN PAGE: After logging into the system, main page window opens. The page displays the two main buttons. If the first button is clicked, then the traffic violation details will be displayed. If the second button is clicked, then fine payment details will be displayed.

2.4 TRAFFIC VIOLATION DETAILS: Once the Traffic violation details button is clicked, the Traffic Violation page is opened. The page is displayed with the vehicle numbers that violated the traffic rules. If the details button is clicked, the details of the traffic violation with the timing and date will be displayed. The fine amount for every vehicle will also be displayed in the same window. There is also a button called view which displays the information and profile of the vehicle holder when clicked. The message can be sent to the particular person regarding the fine payment as a message to the mobile when send message button is clicked.

2.5 FINE PAYMENT DETAILS PAGE: Fine payment details page displays the vehicle number, name of the vehicle owner, the fine amount to be paid by each person. The current status of the payment is also displayed on the screen.

3. SYSTEM DESIGN: The System Design Document describes the system requirements, operating environment, system and subsystem architecture, files and database design, input formats, output layouts, detailed design and processing logic and external interfaces. The purpose of the paper is to collect and analyze all assorted ideas that have come up to define the system, its requirements with respect to tracking the Traffic Violation. Also to predict and sort out how this system will be used in order to gain a better understanding of the system and document ideas that are being considered. The scope pertains to the successful live project for our tracking the Traffic Violation using QR reader.
It focuses on tracking the vehicles which violates the rules, timing and fine payment that allows monitoring the vehicles that violates the traffic rules. The standard can be used to create software design or can be used as a model for defining a project specific standard.

3.1 SYSTEM ARCHITECTURE: The Architecture of the system describes feasibility on the IDA. The architecture may be a simple system in which web technologies are used to provide forms from a simple server. With the simple requirement to collect basic information which can be entered as it is captured by the user, this two-tier architecture may be sufficient. N-tier architectures can often be divided into several tiers as follows:

- **Access tier:** Which facilitates provides the facilities to store data. Access by the admin through technologies such as web browsers.
- **Presentation tier:** The layer that accesses information from the other system as required and can contain its own rules for simple processes.
- **Information tier:** Contains the business information layer.

![Violation recording system in cars](image1)

**Fig. 1: Violation recording system in cars**

![Different stages of Traffic Sign Identification via RFID Technology](image2)

**Fig. 2: Different stages of Traffic Sign Identification via RFID Technology**
The characteristics of the system is to operate in the real-time environment, the nature of the interface to the users of the system, a large number of concurrent users, to provide security features to protect data, to be scalable and easily maintainable in the future, to have any special back-up facilities to protect important data. Figure 1 shows the violation recording system in cars. In Figure 2 it shows the different stages of traffic sign identification is found through the RFID technology.

4. INFRASTRUCTURE SERVICES: Infrastructure services are provided to tracking the Traffic Violation system with a view to reducing the time, cost and risks of development through re-use. To gain full advantage of infrastructure services the requirements of applications and the anticipated requirements from future applications are analyzed. This should be fed into the design of the services:

- Security (Tracking the Traffic Violation System is fully secured application and it provides access only to the authenticated users (Admin))
- Audit (TTVS has audit function to fully monitor the audit)
- Performance monitoring and reporting (TTVS is developed in the view for monitoring the performance clearly and reports are generated based upon the performance monitoring details)
- Error Handling (TTVS is developed for easy use and it is developed for handling the error properly)
- Debugging (debugging options are clearly developed in tracking the Traffic Violation System).

4.1 TYPES OF DATA AND INFORMATION FLOWING OVER THE INTERFACE:

- All screens will have the name of the system, tracking the Traffic Violation System displayed on the screen.
- After the login screen, all screens will provide the user or operator with the ability to navigate through the system, i.e., to select different functions of the system.
- The user or operator would be able to view the vehicle numbers that violated the traffic rules.
- The user or operator will have the option to view the Aadhar card and personal details of the person.
- The user or operator can send the fine amount to the particular person.
- The user can view the present status of the fine payment.
- The user will have the option to go back and change the selection.

5. DESIGN METHOD AND STANDARDS: The design method used should be named and referenced. A brief description may be added to readers that may not familiar with the method. Any deviation and extensions of the method should be explained and justified. The projects are vulnerable to legislative and political change. The following standards for avoiding traffic violation are as follows.

5.1 DOCUMENTATION STANDARDS: For a software implementation, a documentation standard contains the standard module header (if necessary) and contains instructions for its completion. It may be that these rules highlight specific areas of code where the commentary should be literally line by line, as this is a particularly difficult area. Other areas, which may be less difficult, could be commented on a ratio of five lines of code to one line of commentary.
5.2 **PROGRAMMING STANDARDS:** This section should define the project programming standards. Whatever language is chosen, the main goal should be to create a convenient and easily usable method for writing good quality software. If an application development tool is used there may be other conventions that need to be defined, e.g. colors schemes. In general, the programming standard should define a consistent and uniform programming style. Specific points to cover are:

- Modularity and structuring.
- Headers and commenting.
- Library routines to be used.
- Language constructs to use.
- Language constructs to avoid.

5.3 **COMPONENT DESCRIPTION:** For a software implementation, this and previous section provides sufficient information for a programmer to produce the software, and for the maintainer, who may not be the developer, to make subsequent changes. The detailed content depends upon the software to be used. The software may be produces using the coding statements written by an application programmer. In contrast, the application may be automatically generated by the application development tool, or indeed a mixture of both.

- **CLIENT BASED COMPONENTS:** User centric graphical interface classes and widgets. (E.g. Java Advanced Window Toolkit, Swing, Java Beans) implemented with automated tools like GUI builders and testers.

- **IMPLEMENTATION COMPONENTS:** General purpose language libraries or bindings that aid in the implementation of a design in a particular language (e.g., JDK, container classes, middleware wrappers, data portability streams), implemented through tools like UML code generators.

- **INFRASTRUCTURE COMPONENTS:** General-purpose processors built for a particular middleware architecture that can be customized for a specific task, implemented through service and modeling tools. (E.g., Rational Rose).

- **ARCHITECTURE COMPONENTS:** Reusable architectural and configuration concepts that are documented and ready for reapplication implemented through automated tools like UML modeling tools. The descriptions of the components should be laid out hierarchically. There are Subsections dealing with the following aspects of each component:
  - **Component Identifier:** Each component has a unique identifier. The identifiers to be used for components should be defined by the project and described elsewhere. The WEB-APPLICATION-EXECUTION-COMPONENT defines a set of execution parameters that are used when starting the Web Application. It takes an attribute id, which specifies the unique identifier for this set of execution definitions. It is this unique identifier that is referenced by an application, providing that application with its set of execution parameters.
  - **Type:** This section describes the type of component, e.g. task, subroutine, subprogram, package and file. Package file for tracking the Traffic Violation System are developed.
  - **Purpose:** The purpose of a component should be defined by tracing it to the software requirements that it implements. Component based applications have been the
standard method for creating applications for the better part of the last decade, because every component has a number of publicly accessible functions that other components can discover and use. The end effect is the components are simple to reuse and allow different applications to work with each other.

- **Dependencies**: The following factors are assumed for developing this project. It is assumed that tracking the vehicles that violates the traffic rules will be monitored every day. Based on the above assumption the vehicle number is being stored in the database. The details of the vehicle owner can be viewed and this is considered and taken ahead for developing this project.

5.4 **Screen Images**:

Fig. 3: Login screen

Fig. 4: Main page
Fig. 5: Traffic Violation Details

Fig. 6: Fine Amount
Fig. 7: Aadhar card

Fig. 8: Profile Details
6. CONCLUSION: The main objective of this development project to fix RFID tags in every vehicle at the time of manufacturing and RFID Reader was placed in every signal, the person who does not follow the rules will be tracked immediately and will be encountered for punishment. The person’s details will be stored in the database and one who breaks the traffic rule will be tracked and caught using RFID tags. The fine payment can be done in online through Android mobile where it contains a QR reader to read the QR code in mobile. The admin is responsible for issuing the Aadhar card. Aadhar card is the card which contains the complete details of the person. The URL of the developed application is embedded into the Aadhar card.

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