IOSR Journal of Engineering (IOSRJEN) **www.iosrjen.org**
ISSN (e): 2250-3021, ISSN (p): 2278-8719
Vol. 09, Issue 3 (March. 2019), ||S (II) || PP 62-68

App Based Vehicle Information System with Smart Monitoring Technique

Ujjwal Barman[1], Suchismita Gupta[2], Trisha Chakraborty[3], Utpal Maji[4], Sudipta Sahana[5]
Department of Computer Science and Engineering, JIS College of Engineering, Kalyani

Abstract: The world is moving fast and getting faster every day, with this changing world one needs to be dynamic and fast in every aspect of life. In this scenario vehicles are the only thing which helps people in a very faithful manner, so this also needs to be available easily and should be allowed in your country to ride it freely and legally. It is also important to keep a check on them. In this paper, we have proposed a system which has been designed to cope up with the need of the hour. The system overcomes the demerits of the existing system like a lengthy registration process, excess documents to be carried, high chances of frauds, less information contained in smart cards. In this system we have planned an online vehicle management system that keeps track of a vehicle right from the moment it is manufacture till it gets demolished.

Keywords: Vehicle, Vehicle tracking, Paperless, Monitoring, Vehicle Pollution, Vehicle Insurance.

Date of Submission: 01-03-2019 Date of acceptance: 18-03-2019

I. INTRODUCTION

This proposed work aims to track and monitor the complete life cycle of a vehicle from the day of manufacturing to the day it gets demolished. The system uses a barcode for the ease of tracking information. The barcode is unique of every vehicle and shall contain a unique code which when scanned by the proper authorities will reveal all relevant information on that particular vehicle. This deeply emphasizes on making the whole "buying a new vehicle" process paperless and fast. Since all the information about the vehicle and or the customer like license number, registration number, car details, pollution details, insurance details will be stored in a server in digital form, the required information could be shared with the concerned authorities without any delay. The project consists of modules like "Manufacturer", "Dealer", "Customer", "RTO", "Insurance", "Pollution department", "Traffic Control department". The vehicle shall be tracked using the unique barcode present on each vehicle through all these modules. All the modules will share a central database server but will only be able to view parts of the database relevant to the module. Having all the information at one server eliminates the problem of ambiguity. Every module will have its own custom interface and login pages under a common domain. They will be able to upload their data using these interfaces. The customer, however, will have a mobile application as the interface to access the database. A customer will be able to carry his/her license number, pollution details, insurance details anything and everything related to the vehicle in that application. Since the application shall be connected to a central server shared by other modules, the updating process will be fully automatic. Whenever a module updates any information on a particular vehicle, the updated information will automatically reflect in the customer application. This automatic updating of information will help the law enforcers, here the police, to track the vehicle more efficiently and easily since it will be very difficult to tamper to generate fake information for the vehicle. This in turn also safeguards customers from corrupt police officials from giving them any fake tickets/challans as the ticket/challan given to the customer will reflect in the customer's mobile application. So, in a precise way, the proposed work aims to make the process of buying and using a new vehicle paperless and hassle-free.

II. RELATED WORK

Avinash Shinde et al. [1] introduced a new approach to control traffic violations by accurately penalizing the traffic violators by generating automatic E-challan, thus minimizing the load on the traffic police. For traffic signal violation and breaking the toll-collection line rules, the vehicles are identified using a RFID reader which further scans the tag on the vehicle for the database entry.

Paal Brevik Wangsness et al. [2] proposed a transport policies analysis system using a stylized model of the transport market in the greater Oslo area with 1.2 million inhabitants in Norway. The medium-term effects of the current BEV friendly policies, the potential of better pricing of car and public transport use and better car purchase taxes are explored.

S. L. Ting et al. [3] proposed study that aims at accessing the feasibility of applying Radio Frequency Identification (RFID) for the purpose of vehicle tracking in a container terminal. In order to discuss the factors that affect the use of RFID in the terminal, it uses a series of experiments in a container terminal. The accuracy and possibility of using RFID in such a challenging environment is also investigated. By the means of case study, the propositions are investigated.

Ramagiri Rushikesh et al. [4] introduced an idea that aims to introduce vehicular pollution monitoring system using Internet of Things (IoT) which is capable of detecting vehicles causing pollution and its level in air. The status of air quality can also be reported through this paper. The existence of wireless sensors for vehicle pollution system that that specialize in a straight forward accessibility of real time data through Internet using IoT is assured by the system. Besides this the measured data is shared with the vehicle owner, traffic department and agencies of national environment.

Prof. Ghewari M. U et al. [5] proposed at system that monitors pollution of vehicles using IoT technology. On pollution detection the Regional Transport Office (RTO) gets warning via mail which includes the vehicle's owner details and location.

Priti Salunkhe et al. [6] introduced an idea where WSN technology is applicable for vehicle pollution control which is easily accessible real time data through web of things. The owner of the vehicle and the traffic department will have the real time data.

Kiwon Lee et al. [7] proposed a study that focuses on transportation application using remotely sensed imagery, in GIS-based environment. It aims at accessibility index extraction using high-resolution imagery, applicable to transportation planning considering an urban environment among transportation.

Jun-Wei Hsieh et al. [8] introduced a system of automatic traffic surveillance to estimate important traffic parameters from video sequences using one camera. It has a good ability to categorize vehicle into more specific classes by introducing a linearity feature in vehicle representation.

III. PROPOSED WORK

I. Manufacturer Portal

Step 1: Each manufacturer must hold an account in the system.
Step 2: In case of new manufacturer, a registration needs to be done i.e. a login id and password need to be generated from the government officials after successful document verification.
Step3: If the manufacturer is already registered, user needs to get the authentication by logging into its account by valid login id and password.
Step 4: Once the manufacturer is logged in, after manufacturing each vehicle, the manufacturer inputs the vehicle specifications along with his/her part information into the database.
Step 5: Manufacturer creates a unique ID, i.e barcode, which should be unique for each vehicle manufactured irrespective of the manufacturer around the globe. This barcode would be a combination of engine number and chassis number, uniquely coupled together to produce the uniquely defined id.

II. Dealer Portal

Step 1: Each dealer must hold an account in the system.
Step 2: In case of new dealer, a registration needs to be done i.e. a login id and password need to be generated from the government officials after successful document verification via the registration portal.
Step3: If the dealer has already registered, the dealer needs to get the authentication by logging into its account by valid login id and password.
Step 4: Once the dealer in logged in, the dealer can now perform two operations.

1. Check the count of vehicle in its inventory.
2. Start a new transaction.

Step 5: The inventory will consist of all the vehicle count and corresponding barcodes of the vehicle which can be sold in future. This inventory is synchronized with the manufacturer inventory and hence gets updated each time manufacturer manufactures vehicle for specific dealer.
Step 6: During a new transaction, dealer first fetches the information in accordance to the specification as per the customer requirement.
Step 7: Dealer records each detail of the customer and takes the corresponding government ID proofs as scanned copies against each barcode of the vehicle. The dealer assigns a temporary registration number against the barcode.
Step 8: Customer details along with scanned ID proofs gets stored into the database which waits for further verification from the RTO.
Step 9: The Dealer generates a unique username and password for each customer in the system.
Step 10: The username and password is sent to the customer's registered phone number as login credentials.

III. RTO Portal
Step 1: RTO portal is capable of performing all document verification.
Step 2: In case of all documents are appropriate, the database is updated with permanent registration number against the mapped barcode ID.
Step 3: In case of defaulters, the customer will be intimidated by message/post with the App or via SMS for providing valid documents in order to process the permanent registration Number.
Step 4: The registration number shall have an issue date and an expiry date (10 years validity).
Step 5: RTO shall notify the customer to collect their vehicle registration number via the App and SMS.

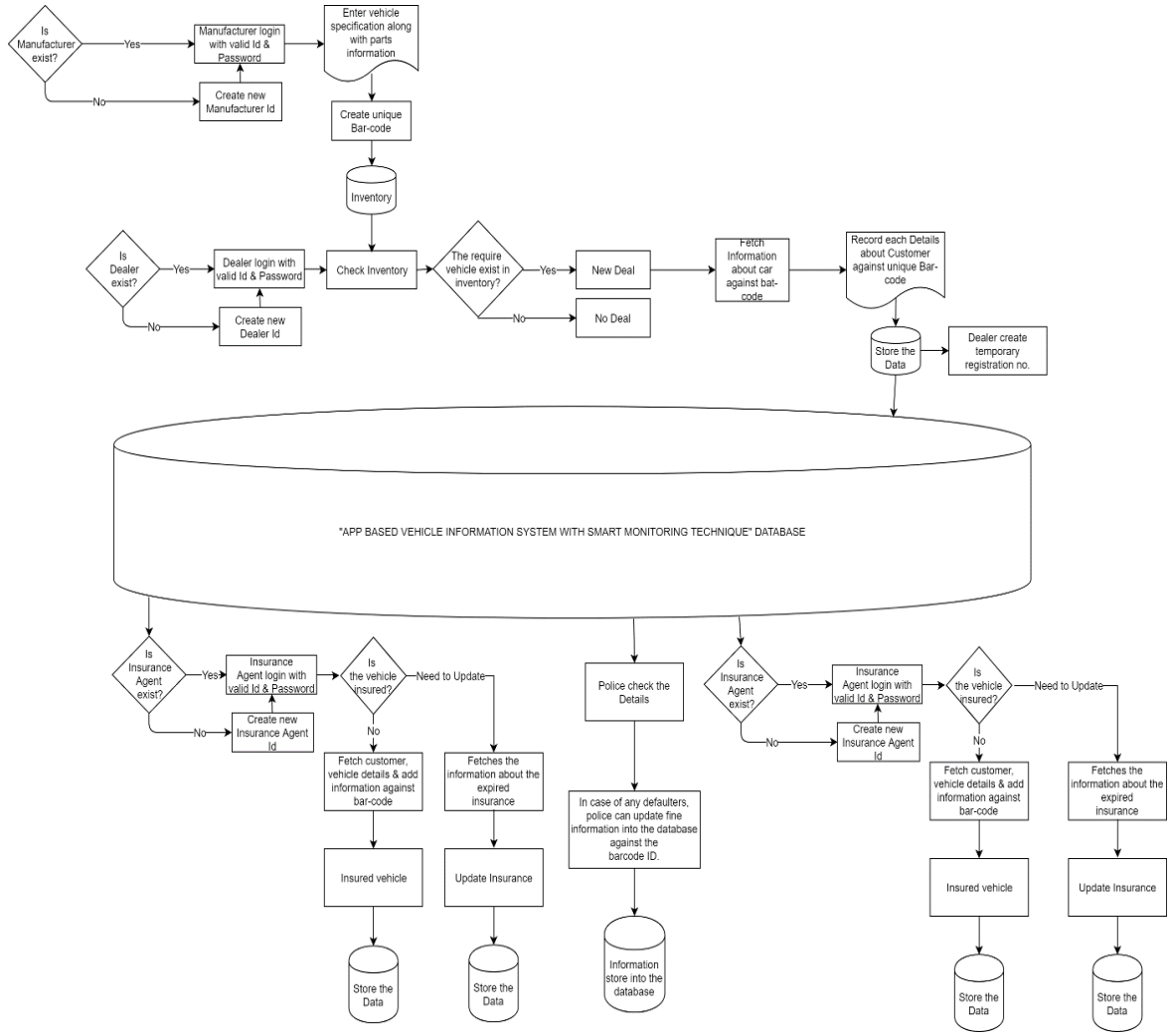
IV. Pollution Control Portal
Step 1: Each pollution control agent must hold an account in the system.
Step 2: In case of new pollution control agent, a registration needs to be done i.e. a login id and password need to be generated from the government officials after successful document verification.
Step 3: If the Pollution Control agent is already registered, it holds the right to update or produce new pollution papers for each vehicle.
Step 4: In case of new pollution control papers, agent inputs new customer details and maps them along with the vehicle barcode ID.
Step 5: For existing pollution paper renewals, the agent first fetches the information about the expired pollution papers from the database and updates the valid till column after successfully passing the pollution tests.

V. Insurance Department Portal
Step 1: Each insurance department agent must hold an account in the system.
Step 2: In case of new insurance department agent, a registration needs to be done i.e. a login id and password need to be generated from the government officials after successful document verification.
Step 3: If the insurance department agent is already registered, agent inputs new customer details and maps them along with the vehicle barcode ID.
Step 5: For existing insurance papers renewals, the agent first fetches the information about the expired insurance papers from the database and updates the valid till column after successfully passing the insurance documents paper check.

VI. Police Portal
Step 1: Police portal can view all the pollution and insurance related details by simply providing barcode ID for each vehicle.
Step 2: In case of any defaulters, police can update fine information into the database against the barcode ID.
Step 3: The police can also check for any offensive record, if any of the vehicle owner.

VII. Customer Portal
Step 1: Customer registration is already done by the dealer.
Step 2: Customer can login into the system (via mobile App) using the username and password provided by the dealer.
Step 3: Customer can view the RTO verification process status, vehicle registration number, vehicle details. The app shall also contain customer license number, vehicle insurance details, vehicle pollution details. Customer can also view the latest traffic challan details given to the customer by traffic police as soon as the customer receives the challan. This eliminates fake challan or any such ambiguity from police side.

IV. CONTROL FLOW DIAGRAM



V. RESULT OUTCOME

The proposed work in this paper will ease the process of buying/driving a vehicle. It will be paperless and fast. Paperless in the sense that all the required documents shall be stored in digital form. Fast in the sense that since all the modules will share a common database system, accessing the required documents will be faster. This will also resolve any ambiguity in the present system of vehicle registration. Consumer/ Vehicle owners need not carry their license, RC book, insurance documents, pollution documents with them while riding the vehicle. All related documents will be stored in digital form and will be easily accessible via the mobile application. To bind all there information together we use the barcode which is easy to scan and will fetch the related data available on a particular vehicle. Using the barcode the traffic police will also be able to collect information on the vehicle correctly.

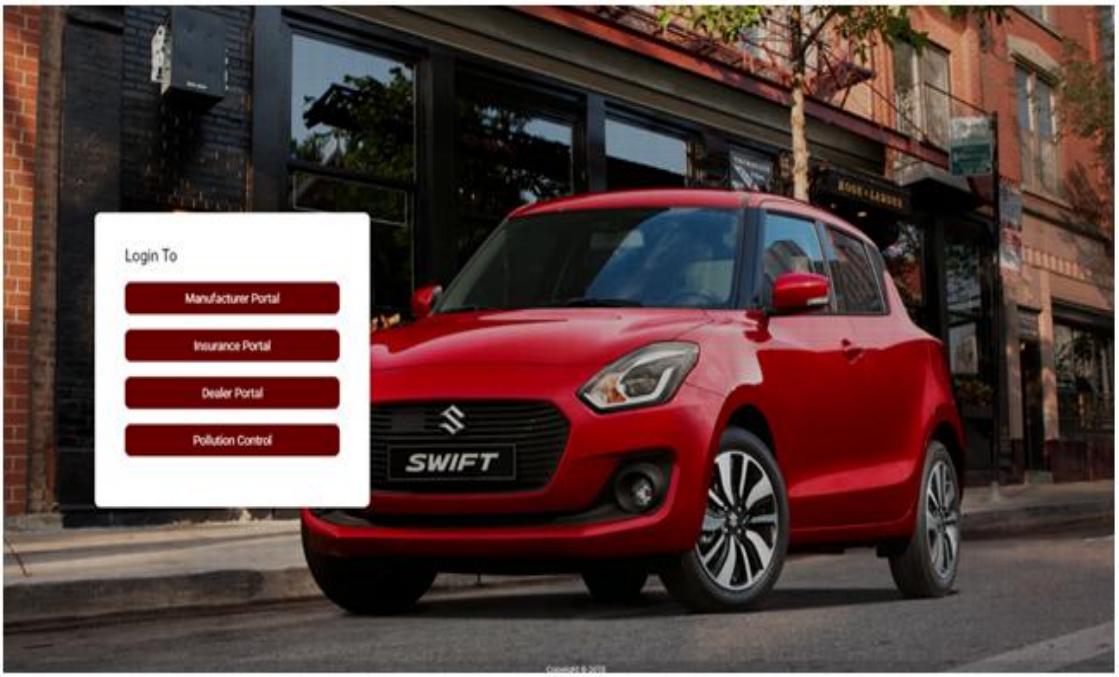


Figure 1: Home Page

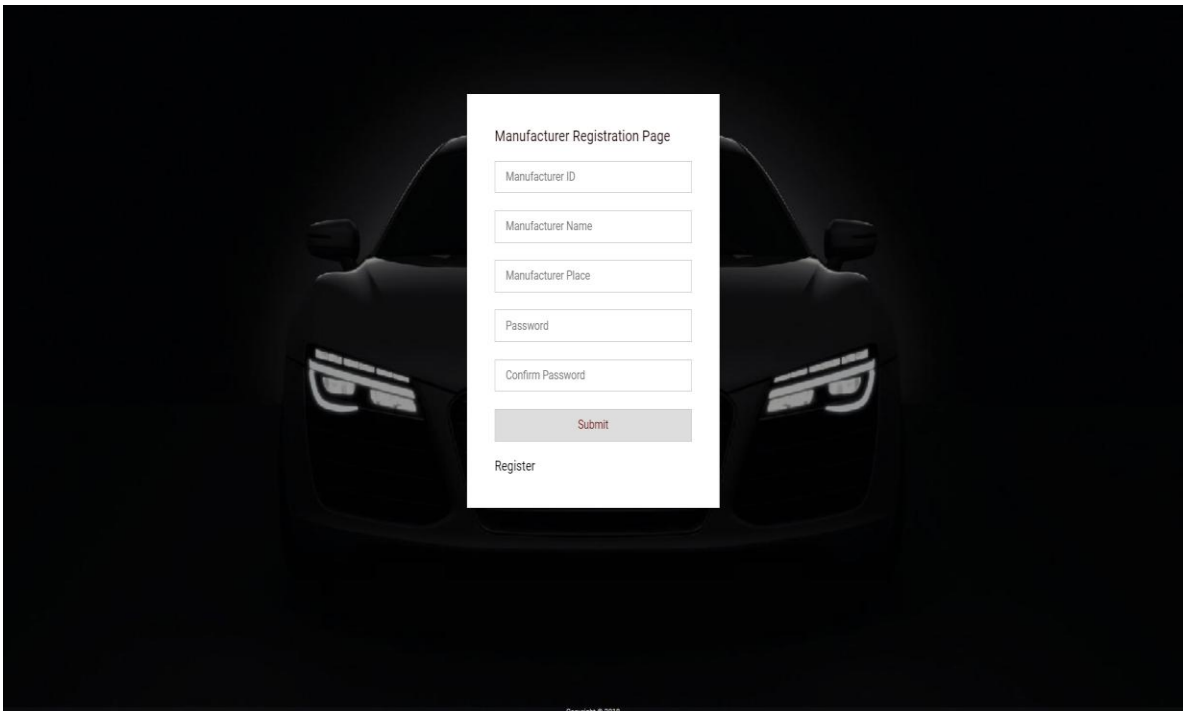


Figure 2: Manufacturer Registration Page

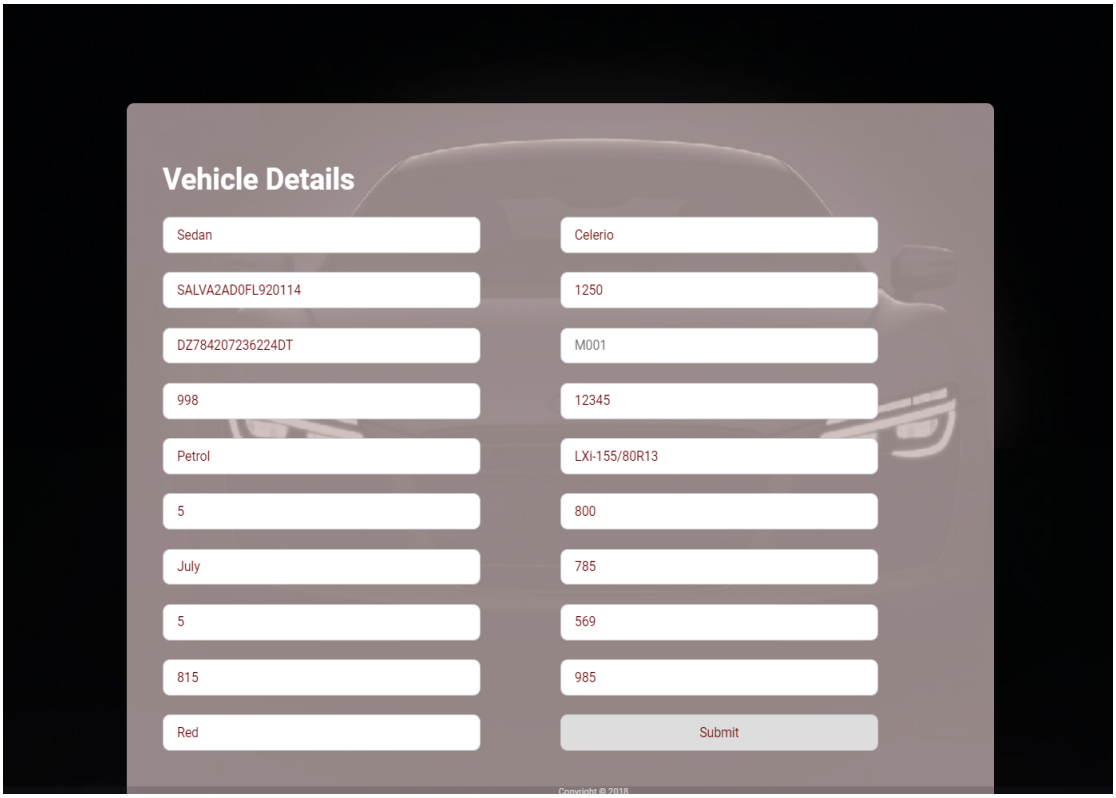


Figure 3: Manufacturer Portal

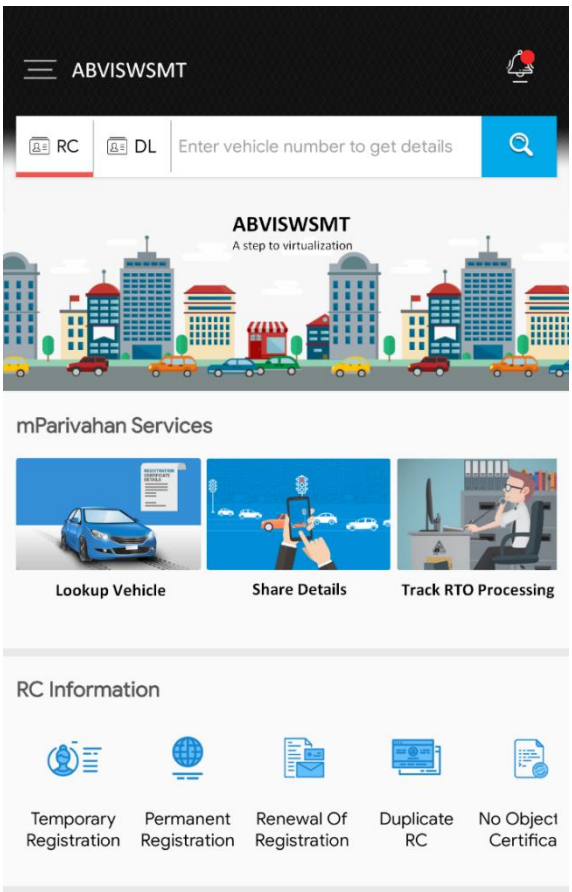


Figure 4: Customer Side Application

VI. CONCLUSION

In this paper we have proposed a expanded functionality of today's software requires an appropriate approach towards software development. This vehicle management system is designed for authorities who want to manage various activities related to vehicle. The manufacturer, dealer, RTO, pollution control and insurance department will all work on their respective portals online and share the required information without any delay. This system will ease the work of the authorities as well by making the system more user friendly. The registration process will no longer be lengthy. This system has lesser chances of frauds. The interactive GUI is beneficial for the user and easy to use.

REFERENCES

[1]. Avinash Shinde, Rounak Sathe, Prakash Sutar, Prof.R.Sadakale, "Automatic E-Challan Generation For Traffic Violation", International Journal of Advance Engineering and Research Development, Volume 4, Issue 8, August-2017.

[2]. Paal Brevik Wangsness, Stef Proost, Kenneth Lovold Rodseth, "Vehicle choices and urban transport externalities. Are Norwegian policy makers getting it right?", Norwegian University of Life Sciences School of Economics and Business, Working Papers No. 2/2018, ISSN: 2464-1561.

[3]. S. L. Ting, L. X. Wang, W. H. Ip, "A study of RFID adoption for vehicle tracking in a container terminal", Journal of Industrial Engineering and Management, JIEM, 2012- 5(1):22-52 – Online ISSN: 2013-0953 – Print ISSN: 2013-8423.

[4]. Ramagiri Rushikesh, Chandra Mohan Reddy Sivappagari, "Development of IoT based Vehicular Pollution Monitoring System", International Conference on Green Computing and Internet of Things (ICGCIoT), 2015, DOI: 10.1109/ICGCIoT.2015.7380568.

[5]. Prof. Ghewari M. U, Tejaswini Mahamuni, Pooja Kadam, Anupama Pawar, "Vehicular pollution monitoring using IoT", International Research Journal of Engineering and Technology (IRJET), Volume: 05 Issue: 02 | Feb-2018, e-ISSN: 2395-0056, p-ISSN: 2395-0072.

[6]. Priti Salunkhe, Sunita Shinde, "Automobile Pollution Control Using VNode", International Research Journal of Engineering and Technology (IRJET), Volume: 03 Issue: 08 | Aug-2016, e-ISSN: 2395 -0056, p-ISSN: 2395-0072.

[7]. Kiwon Lee, Se-Kyung Oh, Hee-Young Ryu, "Application of high resolution satellite imagery to transportation: Accessibility index extraction approach" Proceedings of IEEE International Geosciences and Remote Sensing Symposium, 4, 2942–2944.

[8]. Jun-Wei Hsieh, Shih-Hao Yu, Yung-Sheng Chen, Wen-Fong Hu, "Automatic traffic surveillance system for vehicle tracking and classification", IEEE Transactions on Intelligent Transportation Systems, 7(2), 175-187.

Ujjwal Barman. "App Based Vehicle Information System with Smart Monitoring Technique." IOSR Journal of Engineering (IOSRJEN), vol. 09, no. 03, 2019, pp. 62-68.