TOLLZ-E (Online toll system)

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ABSTRACT:- This paper mainly focused on how the electronic toll collection system reduces manual work load using RFID technology. Ultimately, this system reduces environment pollution due to the burning of fuel as well as reduces the waiting time of users in toll queue. Users can access the website and may perform their toll transaction from any location. Their transaction will reflect in the centralized database. Due to the use of online transaction, users do not need to carry cash with them. This leads in the reduction of human error occurring at the toll booths. Cashless transaction gives the transparency to this system. This design of the system includes an IoT module which will help to send a confirmation text to the vehicle owner about the toll deduction.

I. INTRODUCTION

It is mobile application, which makes it easy for people to pay their toll rates online, instead in long queues. It helps the users to easily pass through the toll gates, and also eliminate traffic. The user can sense the tollgates ahead and can pay them earlier online and registering his car number. Electronic toll collection system is used for transforming manual transaction work to the automatic toll collection using RFID technology. The main objectives behind the systems are reducing the longer waiting time in the toll queue, reducing illegal toll gate entry, improving the speed and the efficiency of traffic flow and saving the driver's time. Due to these objectives, it reduces loss of fuel, use of paper and efforts in the management at toll plaza. RFID tags provided to the users are scanned through RFID reader fixed at toll booths in specific positions and online transactions are carried out regarding the specific RFID tag number of user. Due to the online transaction this system provides transparency to the whole system. From the user point of view, mobile application is provided.

II. LITERATURE SURVEY

[1] "FASTAG" by

FASTag is a toll collection system in India, operated by the National Highway Authority of India (NHAI).It employs Radio Frequency Identification (RFID) technology for making toll payments directly from the prepaid or savings account linked to it. A radio-frequency identification system uses tags, or labels attached to the objects to be identified. The tag can be purchased from official Tag issuers or participating Banks. It also includes either fixed or programmable logic for processing the data. In this system sensors were placed above roads and vehicles get charged, a sensor identifies the vehicle number and the details were sent to server, which is processed and toll is collected. But this technology has some risks. RFID technology is based on image processing technique in which number plate is scanned as an image, afterwards further processing on that image is done and remaining task get finished regarding toll collection of particular vehicle. In the current scenario number of lanes following Fastag is utmost one, remaining are operated normally. But problem with this system is that, if due to mud or any other reason number plate of vehicle gets covered and not visible properly then sensors cannot detect it properly. So, it raises a problem while identifying the vehicle and obviously toll collection cannot be completed.

[2] "Development of a GPS-based highway toll collection system" by Jin Yeong Tan, Pin Jern Ker in 6th IEEE International Conference on Control System , Computing and Engineering in 2016:

The necessity for vehicles to stop or slow down for toll fee payment results in traffic congestion and reduces fuel efficiency. Hence, a system that enables road users to pay the toll fees without stopping or slowing down was proposed and developed. Hardware and software designs were carried out to develop a Global Positioning System (GPS)-based highway toll collection system. This system was developed using a Raspberry Pi 2 microcontroller. Different modules such as GPS module, Liquid Crystal Display (LCD) module, speaker, wireless Wi-Fi router modem and wireless Wi-Fi adapter were incorporated and integrated with the microcontroller to perform a few specific functions. In general, the system utilized

GPS coordinates to detect whether a vehicle passed through predefined locations in the database and the travel details were recorded. The Raspberry Pi 2 microcontroller was configured as a personal cloud server to allow online access of travel logs. This developed system presents a different approach for highway toll collection which eliminates travel delays and construction of expensive gantries or toll booths.

[3] "TOLL PLAZA PAYMENT USING QR CODE" by:

It is very challenging to handle a vehicular flow by a manual system of revenue collection. An automated electronic application which makes easy for user by the help of Android and QR code as media access automatically without manual service. User register to get own login id and password and using the login id and password the user can enter in to the application. The current location i.e. the source address will be automatically generated by map using GPS locator and the destination address will be selected by the user. Then the vehicle registration can also be done in the add vehicle page .the user can add as many number of vehicles desires. In details page the vehicle detail, duration for the travel, number of tollgates present in that route, amount to be paid will be displayed. The payment can be done in the payment session by the use through online. The QR code will be generated after the user pays so that it is used as gate pass for user to cross the tollgates. QR code is designed to speed up services for users in toll plaza. Administrator will scan the users QR code and it will generate information of payment details. The most crucial stage in achieving a new successful system is that it will work efficiently and effectively.

III. EXISTING SYSTEM:

There are various kinds of existing gates like slide gates, swing gates, barrier gates etc. These are the commonly used types apart from these there are hydraulic gates etc. They are controlled mostly manually. To avoid these issues an automated systems are implemented. It uses microcontrollers and RFID and opens the gate when a vehicle with a known tag enters. But this system consists of microcontroller, pc with server. Until somewhat recently, the most Common approach for collecting tolls was to have the driver stop and pay a toll collector sitting in a Tollbooth. The toll collector determines the amount to be paid by each vehicle based upon its Characteristics or classification.

IV. PROPOSED SYSTEM:

This paper gives the simplified procedure to passengers to pay the tolls by making them automated and also provides intimation about vehicle. All these activities are carried using single RFID tag thus saving the efforts of carrying money and records manually. The RFID Readers mounted at toll booth will read the prepaid RFID tags fixed on vehicles windshield and automatically respective amount will be detected. Since every vehicle registration ID is linked to user account, toll can be deducted from the account bank directly. The route have been chosen by using the shortest path algorithm where the user can select the easy and shortest way.

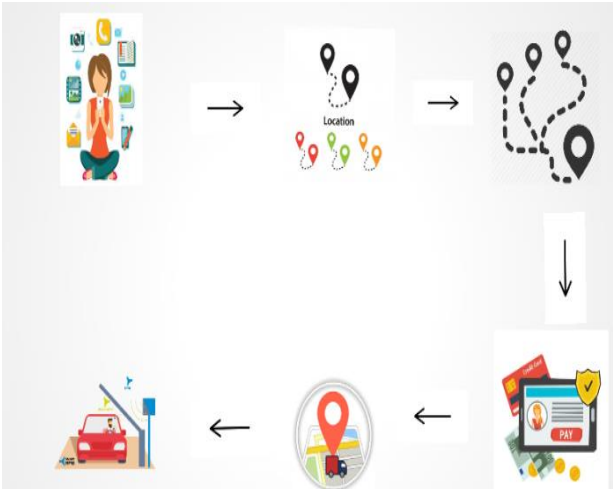
[1] Automatic toll collection

When the vehicle is going to enter into the toll plaza, the first aim is to detect the type and no. of the vehicle. After the payment has been done, the message is generated by the server stating the time, cost and date the user travels and it is checked by the toll person. After validation the user can pass through the toll gate.

[2] Theft detection:

Our database maintains the whole list of vehicle owners as the vehicle registration could only become successful after fixing the RFID tag on the vehicles according our proposed scenario. Thus When an unauthorized vehicle does pass through the toll gate it could be easily detected. The vehicle owner could report the vehicle theft to the person who handover the particular vehicles tag id to the Toll booth user. The person who is authorized to view the vehicle details on the monitor and could prevent the vehicle from getting passed through the toll gate and catch the theft red-handed.

V. BLOCK DIAGRAM:



The user after downloading and installing the application they can sign-up. After logging into the app they can select the source and destination. After selecting the locations, the app will generate the best three routes which were calculated by shortest path algorithm. The routes will be displayed along with the cost of toll gates, total kilometres and the places where these toll gates are situated. After this the user can pay through online. A message will be generated by the server automatically. So near the toll gates if the user shows this message there are free to pass the toll plaza.

VI. SOFTWARE IMPLEMENTATION:

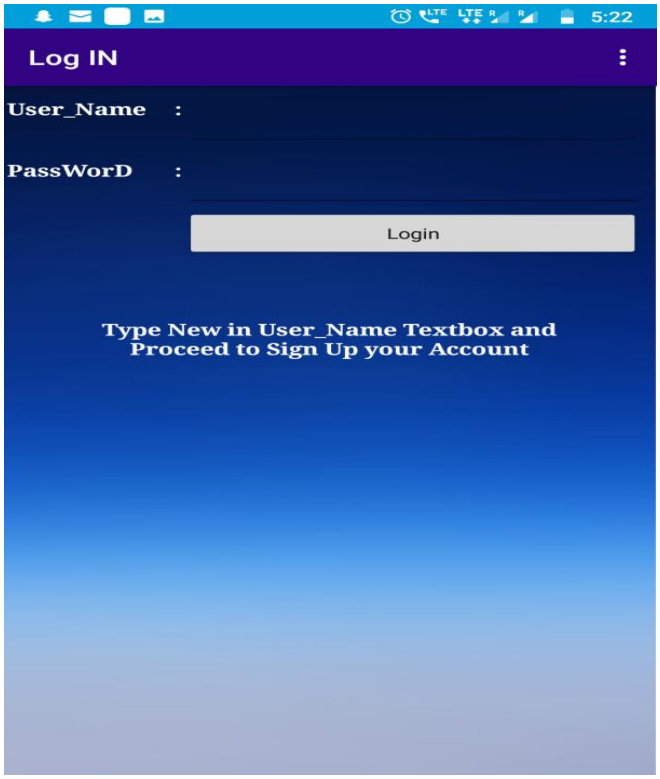


FIG1. LOGIN PAGE

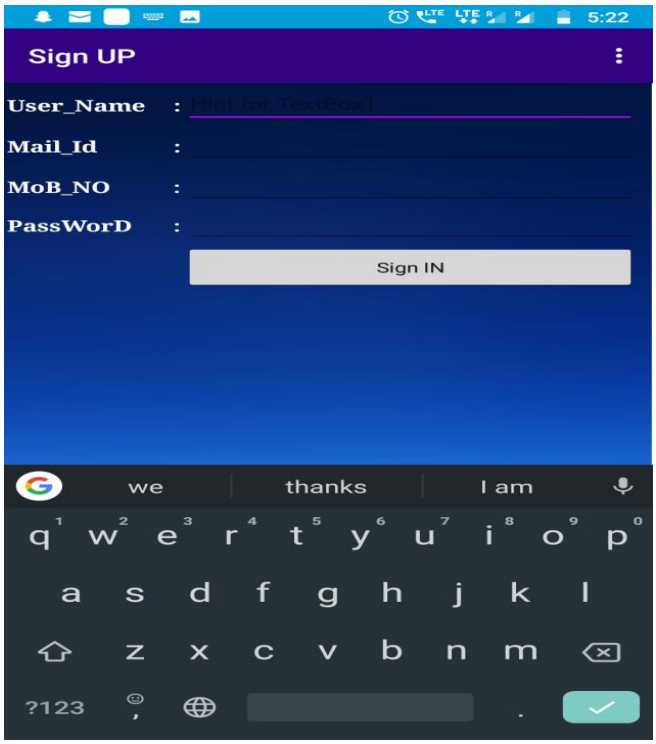


FIG2.SIGN_UP PAGE

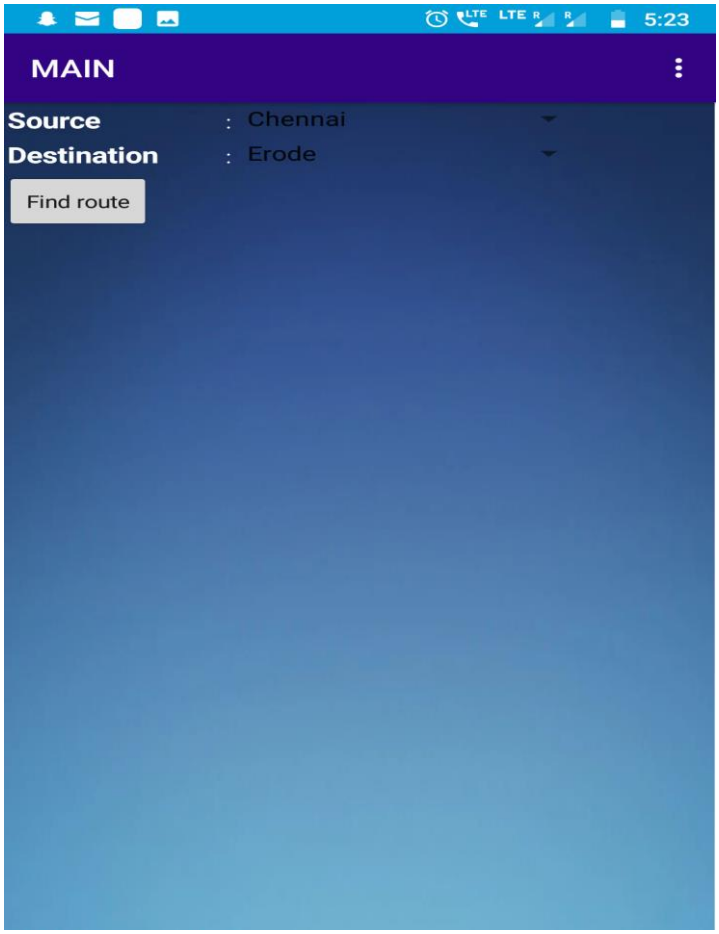


FIG3.CHOOSING THE SOURCE AND DESTINATION

FIG4. CHOOSING THE BEST PATH

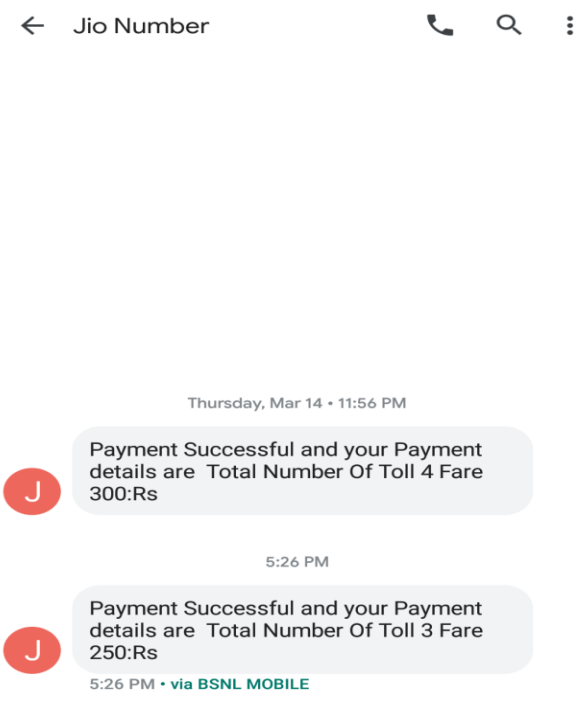


FIG5. MESSAGE GENERATION

VII. CONCLUSION:

In this paper, we have presented the implementation of message generating system in the application of toll tax system. Toll collection stations allow the traffic to flow continuously and vehicle having been avoided stopping and starting again. This in combination with reduced fuel consumption has positive effect on environment i.e. pollution created will be minimum. Implementing the messaging technology is also not so costly. Man power and cash risks are also reduced to minimum. Furthermore, only a minimum of traffic disruption is caused during installation. The system also increases safety, as bottlenecks and long queues are avoided. Society and business community also gain from the system as it results

in faster transportation. The system is cost-effective, time saving and easy to install which benefits the operator as well as user. The system has
successfully overcome the shortcomings of the existing system by reducing the man power at the toll booth. It provides easy way of toll collection and maintenance of the information.

VIII. FUTURE SCOPE:

- Change in travel patterns
- Public transport improvements
- Traffic flow improvements
- Congestion Reduction
- Better environment
- Revenue Generation
- Increased Safety

IX. REFERENCES:

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