GOVERNMENT POLYTECHNIC PUNE-17

(An autonomous institute of Government of Maharashtra)

A System Requirement Specification on
Final Year Project

"ONLINE TOLL PAYMENT SYSTEM"

Submitted to Government Polytechnic, Pune
In the partial requirement of diploma in
Computer Engineering

By

Kaustubh Kakade (1426229)
Rohan Deshmukh (1426208)
Abhishek Konde (1426236)
Vivek Patil (1426248)

Department of Computer Engineering
Government Polytechnic, Pune

Guided By:
Prof. S. P. Emekar.

GOVERNMENT POLYTECHNIC PUNE-17

(An autonomous institute of Government of Maharashtra)

CERTIFICATE

This is to certify that the project report entitles

"ONLINE TOLL PAYMENT SYSTEM"

Submitted by

1 ROHAN DESHMUKH	(1426208)
2. KAUSTUBH KAKADE	(1426229)
3. ABHISHEK KONDE	(1426236)
4. VIVEK PATIL	(1426248)

is a bonafide work carried out by them under the supervision of Prof. S.P.Emekar and it is approved for the partial fulfillment of the requirements of Government Polytechnic, Pune.

Place: Pune
Date:

Mr. S.P.Emekar (Project Guide)	Prof. Mr. Nandanwar (Principal)	Prof Mr.U.V.Kokate (Head of Department)

ACKNOWLEDGEMENT

The seminar would not have been the light of the day without the whole hearted support of our guide Prof. S.P Emekar. He always boosted our morals.

We thank Sir for his conception and encouragement during the seminar .He is a teacher we could respect, a guide who knew all answers and a role model we could strive to emulate .We admire his patience and understanding that he guided us in a field. We had no provision experience us through essence of time management, need of efficient organization, presentation skills and how vital it is to design a product from the user's perspective.

Nonetheless ,over the weeks, all other faculty members of Computer Department have rendered us significant encouragement ,in vigorous and continuous and kind guidance .We thank them all for their invaluable guidance and other people who directly and indirectly assisted us in the successful and timely completion of the seminar "ONLINE TOLL PAYMENT (TOLLAPP)"

Project Team

ROHAN DESHMUKH (1426208)

KAUSTUBH KAKADE (1426219)

ABHISHEK KONDE (1426224)

VIVEK PATIL (1426248)

ABSTRACT

TOLLAPP is a utility app used by drivers to receive up to date road and bridge toll prices during their driving experience. TOLLAPP brings transparency and adds value to determine mobility needs.

One alternative moving forward in the change to All Electronic Tolling (AET) is for drivers to purchase RFID toll tags. TOLLAPP saves both the toll authority and the driver from time wastage of waiting in line and waiting for change, etc. The TOLLAPP mobile application gives the user the convenience of making toll payments on their smart phone in real time.

The user will choose the source and destination on the app and the Toll Names and amount of applicable Toll Fees will appear. Payment can be facilitated through credit cards and debit cards payment integration. An electronic receipt be generated, with QR code which can be shown at the Toll Booth. A list for all the toll plaza and respective services to be made available in the app.

TOLLAPP customers get to travel the roads as prepaid toll tag customers, so take advantage of all electronic lanes and avoid the traffic and long lines at the cash lane.

INDEX

1. INTRODUCTION

As we all know that transportation is the backbone of any country's economy. Improvement in transportation systems result into the good lifestyle in which we achieve extraordinary freedom for movement, immense trade in manufactured goods and services, as well as higher rate of employment levels and social mobility. In fact, the economic condition of a nation has been closely related to efficient ways of transportation. Increasing number of vehicles on the road, result into number of problems such as congestion, accident rate, air pollution and many other. All economic activities for different tasks use different methods of transportation. For this reason, increasing transportation is an immediate impact on productivity of nation and the economy.

Reducing the cost of transporting resource at production sites and transport completed goods to markets is one of the important key factors in economic competition.

Our project combines toll payment with android by allowing user to pay tolls online itself using the app 'TOLLAPP'. This approach tremendously speeds up the toll collection process, as the vehicles don't have to stop at toll booths.

2. PROJECT DESCRIPTION:

2.1 Existing System

A toll road is a roadway for which a fee (or *toll*) is assessed for passage. It is a form of road pricing typically implemented to help recoup the cost of road construction and maintenance. Tolls are collected at points known as toll booths, toll houses, plazas, stations, bars, or gates. The user drives his vehicle into the toll booth where is it is stopped by a barrier. The user pays his toll to the cashier at the booth. Once the toll is paid, the cashier returns change and a receipt of payment of toll. The cashier then opens the barrier and lets the user pass through.

Drawbacks:

1. The system is time consuming due to collection of cash and tendering the change.
2. Wastage of paper due to printing of receipts.
3. Corruption due to illegal toll collection.
4. User does not have idea about the number of tolls in route.
5. Rates of tolls are unknown to user.

Need for New System:

1. The main objective of Online Toll Payment System is to efficiently pay toll beforehand in order to reduce time consumption/wastage.
2. Online Toll Payment System will reduce hectic job of toll collectors.
3. User can check the number of tolls in the route and also the fees for the respective tolls.
4. Online Toll Payment System will provide cashless transaction.

Features:

1) User Friendly GUI.

2) There are two types of user's- Administrator and User. Security is based upon user name and password.

3) Application will allow only valid users to access the system.

4) Tolls are displayed on map along with route and user can select the tolls he/she wants to pay.

5) Different payment options such as debit card, credit card, wallets are available.

6) Receipts are generated in form of QR code.

2.2 Scope of Work:

Since this online toll payment application is a web base application so it can be used from anywhere but can be accessible by only user with continuous internet connection. The applications scope is only till Maharashtra.

3. SYSTEM SPECIFICATIONS

3.1 Hardware Requirement:

1. TollApp:

a. Minimum processor GHz (Recommended GHz)

b. Minimum RAM GB (Recommended GB)

c. Hard Disk minimum GB (Recommended GB)

d. Internet Connection minimum 256 Kbps (Recommended 1Mbps)

2. Admin TollApp:

a. Minimum processor P4 1.2 GHz (Recommended Dual Core)

b. Minimum RAM 512 MB (Recommended 1 GB)

3.2 Software Requirement:

1. Android OS

3.3 Detail Description of Technology Used:

1. Android-

   Android is a mobile operating system developed by Google, based on the Linux kernel and designed primarily for touchscreen mobile devices such as smartphones and tablets. Android's user interface is mainly based on direct manipulation, using touch gestures that loosely correspond to real-world actions, such as swiping, tapping and pinching, to manipulate on-screen objects, along with a virtual keyboard for text input. In addition to touchscreen devices, Google has further developed Android TV for televisions, Android Auto for cars, and Android Wear for wrist watches, each with a specialized user interface. Variants of Android are also used on notebooks, game consoles, digital cameras, and other electronics. Android's source code is released by Google under an open source license, although most Android devices ultimately ship with a combination of free and open source and proprietary software, including proprietary software required for accessing Google services.

2. Navigation-

Navigation, science of directing a craft by determining its position, course, and distance traveled. Navigation is concerned with finding the way to the desired destination, avoiding collisions, conserving fuel, and meeting schedules.

3. QR code-

QR code (abbreviated from Quick Response Code) is the trademark for a type of matrix barcode (or two-dimensional barcode) first designed for the automotive industry in Japan. A barcode is a machine-readable optical label that contains information about the item to which it is attached. A QR code uses four standardized encoding modes (numeric, alphanumeric, byte/binary, and kanji) to efficiently store data; extensions may also be used. The QR code system became popular outside the automotive industry due to its fast readability and greater storage capacity compared to standard UPC barcodes. Applications include product tracking, item identification, time tracking, document management, and general marketing. A QR code consists of black squares arranged in a square grid on a white background, which can be read by an imaging device such as a camera, and processed using Reed–Solomon error correction until the image can be appropriately interpreted. The required data is then extracted from patterns that are present in both horizontal and vertical components of the image.

4. PROPOSED SYSTEM

4.1 System Architecture:

4.2 Proposed System:

Online Toll Payment System software is meant for users to pay toll online. This project will enable user to pay tolls beforehand itself and have QR code generated in form of receipt.

This system is capable of serving around at any given time with full reliability and sustainable performance level.

For this system there are 2 applications, TollApp and Admin TollApp. TollApp is an application for the users to find tolls and pay them. User has to register with his details as well as vehicles details. He chooses the tolls he wants to pay between source and destination and pays them. When payment is successful, all required details are stored in form of QR code.

Admin TollApp is an application for toll user who can scan the QR code generated by TollApp. The toll user also has to register with details such as toll location, toll user id, toll email_id,etc in order to use the application. After toll user logs in, scanner is opened to scan the QR code of the customer.

4.3 Objectives of the System:

1. The main objective of Online Toll Payment System is to efficiently pay tolls beforehand in order to save time spent in waiting lines.

2. Online Examination System will reduce hectic job of toll collectors.

3. To encourage Digital Payment through debit/credit cards, wallets, etc.

4. To provide information about tolls and their toll fees.

5. To prevent corruption caused by Road Authorities by collecting illegal tolls.

4.4 User Requirements:

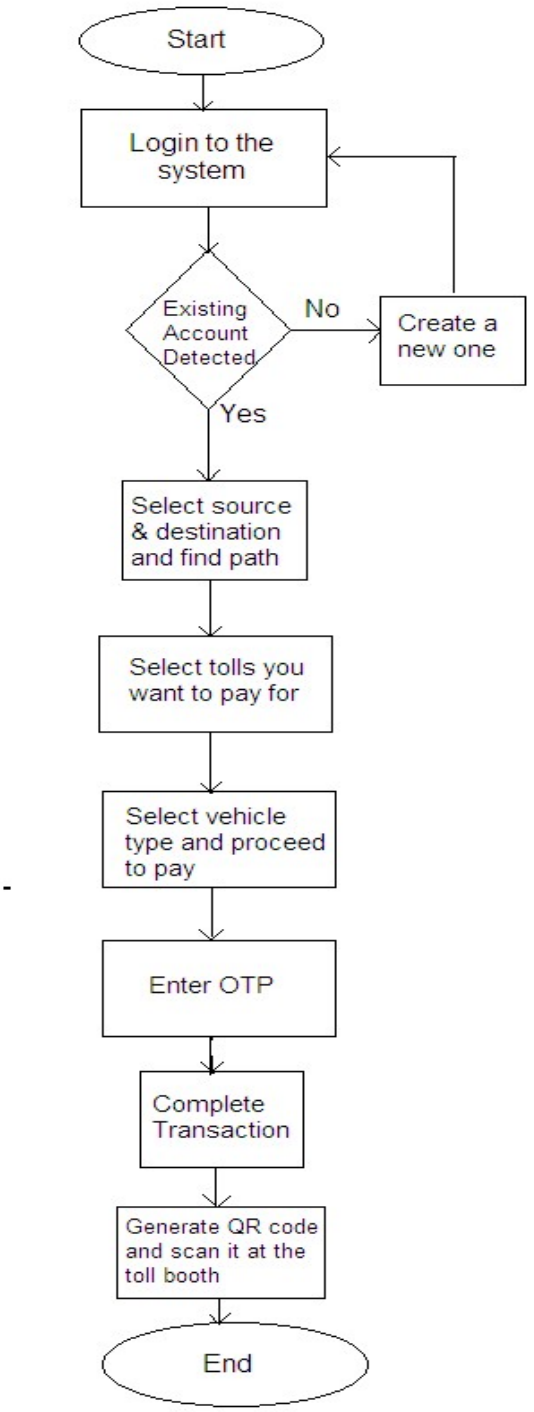
1. Android Phone

2. Net Connection.

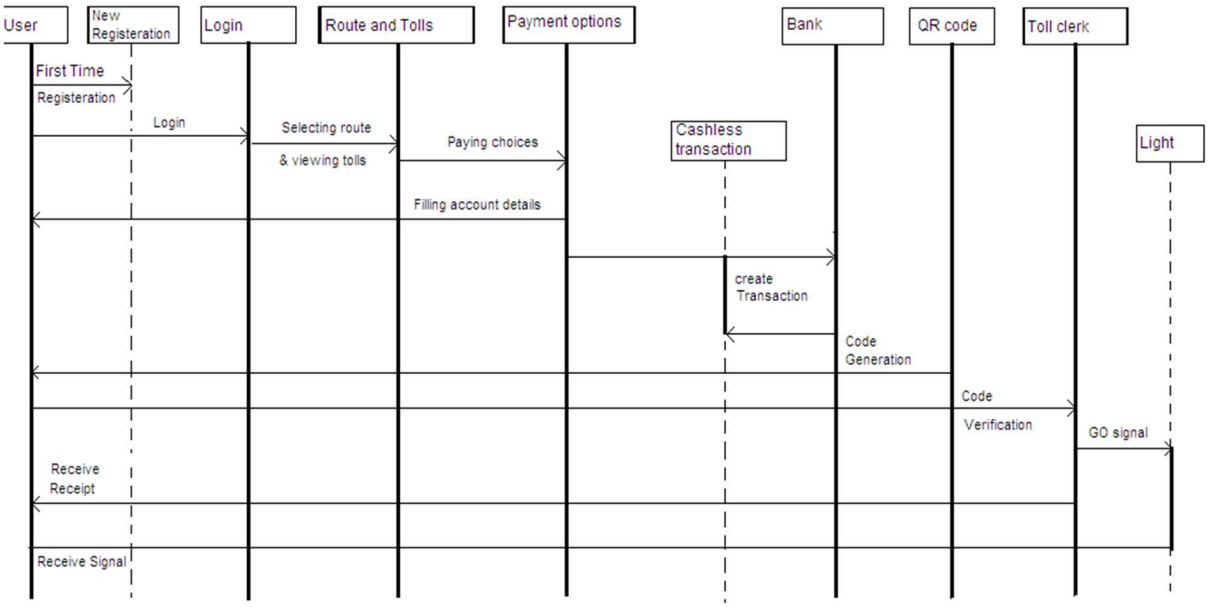
3. Debit/Credit card or wallet account

5. ANALYSIS AND DESIGN

5.1 Diagrams- UML/ERD: DFD



SEQUENCE DIAGRAM



USECASE DIAGRAM

5.2 Database Design:

1. TollApp

2. Admin TollApp

5.3 Module Specification

5.3.1 TollApp:-

1. User Registration:-

User provides information such as Name, Mobile no, Email Id, Password. This data will be stored in 'FireBase' database. A validation mail will be sent to the email id provided by the user.

2. User Login:-

User, who have registered, and have validated themselves, will enter their respective email id and password. The details entered will be cross checked with data in the database. If entered details are correct, user will be logged in or else an error will appear.

3. Route Selection:-

The user will choose if he wants a single trip or round trip. The user will now enter the source and destination locations. Tolls will appear on the map with route. He will choose his vehicle type. The user will decide which tolls he/she wants to pay and would proceed to 'Make Payment' option. A total amount of toll payable will be alerted to user. Then, all the information of the user required for the receipt generation will be fetched from database

4. Payment:-

Different payment options are available to user such as debit card/credit card or wallets. Using any one of the options ,the user will pay the toll fees which he/she has selected.

5. QR Code Generator:-

After payment is successful a QR code will be generated using the information retrieved from database and information provided by the user such as tolls, single/round trip, vehicle type, etc.

5.3.2 Admin TollApp:-

1. Toll Registration:-

Toll User provides information such as Toll User Id, Toll Location, Email Id, Password. This data will be stored in 'FireBase' database. A validation mail will be sent to the email id provided by the user.

2. Toll Login:-

User, who have registered, and have validated themselves, will enter their respective email id and password. The details entered will be cross checked with data in the database. If entered details are correct, user will be logged in or else an error will appear.

3. QR Scanner:-

QR code scanner will scan the QR code generated by TollApp. The information/receipt will be displayed on his/her screen.

6. MAJOR MODULE CODING

7.Snapshots:

7. LIMITATIONS

As no system is 100% efficient, the system developed by me also has some limitation

1) Internet connection is required for sign in purpose.

2) Only Users who have registered, can use the application.

3) Current system provides tolls only in Maharashtra.

4) Offline payment not available.

5) Toll rates are not dynamic.

9. CONCLUSION

One of the most important impacts of technology is the development of sustainable technologies that reduce the traffic conjunction and that need of future generation, save energy and time. Our project mainly impact full in these aspects, by saving the time on the toll, and also for to save fuel and by regulating the pollution and usage of vehicle at toll gates; This system pays toll at a faster rate than the traditional toll payment system. Thus, this app helps in many ways for enhancing the process of toll payment.

10. REFERENCES

1) https://www.tutorialspoint.com

2) https://developer.android.com/index.html

3) https://github.com/

4) www.stackoverflow.com

5) www.google.com

11. BIBLIOGRAPHY

Internet

We have visited some of sites to collect information about online toll, we have studied their functionalities and prepared a list. We have selected some of important functionalities and prepared a list. We have selected some of important functionalities as a scope of our project.

Visited Sites

1) www.tutorialspoint.com

2) www.developer.android.com/index.html

3) www.github.com

4) www.stackoverflow.com

5) Android Black Book – Pradeep Kothari