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Online Bus Tracking and Ticketing System

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Abstract

Due to immense development in technology, every field is making the best use of technology so why not our public bus transportation. Today's transportation system still uses the traditional ways for ticketing. Also people need to stand in queues for long hours. Therefore user needs a smart system which provides real time information of bus and gives an easy way to purchase a ticket. So we proposed a new android application which overcomes the disadvantages of the current public transportation system. Our application will handle all the data like current location of bus, punching of bus-passes having QR code, On-time ticketing using E-wallet or cash Ticket generation with the help of Blue-tooth printing. The real time tracking of bus can be done by our proposed system and this information is then given to remote user. Technologies like QR-Code (Quick Response code), Blue-tooth printing, GPS (Global Positioning System), Cloud, E-wallet are used for development purpose. Our system provides an Android application, which gives bus pass with QR code, real time location of bus to user.

Keywords: Android, Blue-Tooth Printer, Bus Tracking, Electronic-wallet, Global Positioning System, Quick Response Code

1. Introduction

Public transportation in many countries is being used as a means of transport for travelling and accordingly people would prefer these public transportation to be scheduled properly, on time and the frequency be increased for commuters to make good use of it. It is necessary for every organizations and individuals to track the vehicle. People will monitor and track the Buses with the help of our Android app using GPS which will save the time. Our Application also consist of E-wallet for Ticketing system. This Cashless Transaction will not only help the Individual but also the Bus Organization. We are also going to provide a virtual Bus-Pass Having a QR-Code. The Bus Organization employee just needs to scan the QR-Code of the respective individual and automatically it will get punched into the Database. The Existing system still uses the non efficient way of ticketing. We will be providing Bluetooth Printer for Easy On-time Ticketing. As the entire data will be saved on a Firebased cloud, it will be helpful for the Bus Organization in the future for increasing the use of public transportation.

2. Related Work

GPS is more popular technology which is used in many applications. This existing system gives information about vehicle position and route travelled by vehicle and this information can be monitor from any remote place or location. This system depends on GPS technology. And also there is no application depending on mobile device to track and get a real time and current view of target or vehicle.

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Author	Paper Title	Publication	Technology used	Limitations
Suresh Sankar- narayanana, Paul Hamilton[3].	Mobile Enabled Bus Tracking and Ticketing System.	IEEE(2014)	RFID,GPS, LCD, ANDROID	Software did not provide accurate results such as location and time.
Ajay Shingare, Ankita Pendole, Nikita Chaudhari[2].	GPS supported city bus track- ing and smart ticketing system	IEEE(2015)	GSM,GPS, Smartcard, Android Application	Application works smoothly offline but crashes when online
Manini Kumbhar, Meghana Survase, Pratibha Mastud[5].	Real time web based bus tracking system.	IEEE(2016)	Google maps, GPRS, GPS	Unable to Provide accurate results, No use of cloud.

Figure 1. Literature Survey of Online Bus Tracking and Ticketing System.

3. Proposed Framework

This Project Application will be useful for the Local People as well as Bus Organization. The Passenger will be able to save his time as he will get the current location of the bus of his required destination. Also our Application provides cash- less transaction. As all the information will be stored on a cloud it will be helpful for the Bus Organization. Our application provides many facilities that will help to increase public means of transportation.

1. The conductor will first Login to the application.
2. After boarding the bus the passenger is asked for his destination.
3. Then conductor will enter the route details as per passenger's requirement.
4. According to the route amount would be charged.
5. If the passenger has bus-pass then the QR-Code would be scanned from conductor mobile app.
6. Then the app would check bus pass status and for that particular day the pass will get punched from the database.

The Architecture of our system is shown in following figure.

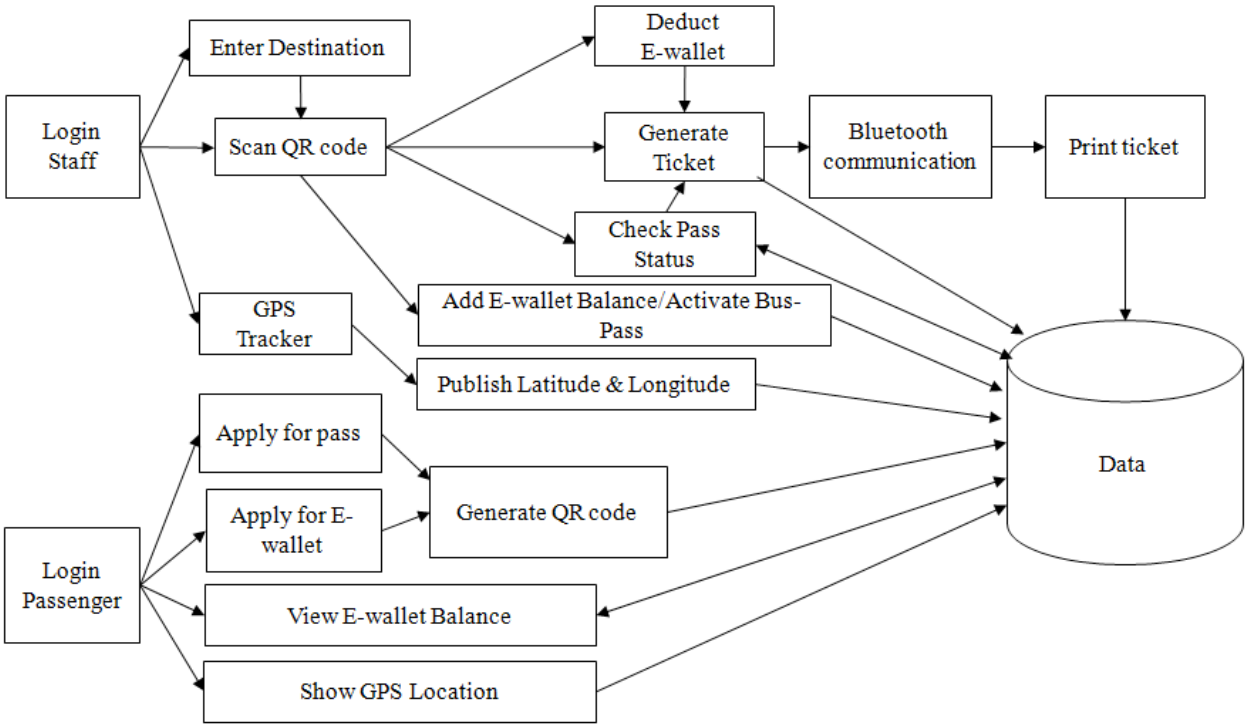

Figure 2. Architecture of Online Bus Tracking and Ticketing System.

4. Mathematical Model

The mathematical model specifies the overall system inputs and the respective responses we will be received based on the inputs given. It also defines several functions which describes the data flow, also the initial and final states of the system, the data which can be determined and the data which will be dynamic. General mathematical model can be stated as:-

{S, Fs, I, O, NoS}

4.1 Overall System Specification.

The specification of the mathematical model with respect to our system can be stated as:-

1. S – The Initial State: The initial state of the system is the user registration.
2. Fs – The Final State: Based on the transaction status the user will receive a notification depicting whether the transaction was successful or transaction was ceased at a particular point, the balance in user account is appropriate or whether it needs to be topped up.
3. I – Set of Inputs: The set of inputs include the user details, E-wallet & the Virtual Bus Pass.
4. O – Set of Outputs: The set of outputs include the delivery of Bus Location to the commuter, the fare calculation output along with the transaction.
5. NoS – Number of Steps: There are total 8 steps included for execution.

- Registration.
- Login.
- QR-Code generation.
- Ticket Generation.
- Scan QR-Code.
- Cash & Cashless Transaction.
- Ticket Printing.
- Bus Tracking.

5. Experimental Setup

The experimental setup to make the product are:

1. Hardware Setup:
Processor : i3 processor
Ram : 4GB
Bluetooth Printer.
Battery: 2000mAh, rechargeable lithium battery
Print method: Line Thermal Printer
Android mobile device

2. Software Setup:
Operating system: Windows XP or higher
Android studio(version 2.1.0)
XML and SQLite for database

6. Expected Result

The basic idea of this project is to help passenger to track the required Bus location.

Also help the bus organization to elevate the quality of service.

The aim is to overcome all the drawbacks faced in all the previous traditional approaches to generate fast and accurate results.

1. Easy tracking of the required bus for the passenger at any given point of time.
2. Use of E-Wallet as well as cash to reduce the time taken for a ticket.
3. Use of Bluetooth printing to help the bus employee.
4. Use of QR code to uniquely identify each passenger.

7. Conclusion

Bus tracking ticketing system is very useful and important mainly in cities. This system has many advantages like easy to use, wide area range, easy to implement in vehicles, more effective, huge capacity etc. This system is made of a tracking module containing GPS model to access dynamic vehicle location and send it to server. Then people can access this information from their android mobile phones. The ticketing process using Bluetooth printer and QR code for bus pass will make a more convenient way for the users as well as the bus transportation management system.

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