

AUTOMATION OF TICKET BOOKING SYSTEM IN PUBLIC TRANSIT

Dr. Kalyan D Bamane^{1*}, Vaishnavi Vaidya², Rishikesh Mundada², Mayur Budhodkar², Jagruti Harne²

Associate Professor, Faculty of Information Technology, D Y Patil College Of Engineering, Savitribai Phule Pune University, Pune, Maharashtra, India¹

Student, Faculty of Information Technology, D Y Patil College Of Engineering, Savitribai Phule Pune University, Pune, Maharashtra, India²

Abstract: *The propounded idea is based on a web app-based system which automates the manual ticketing system in public transit. It uses QR code generated from app which deducts money from linked accounts. It also scans the count of passengers entered in bus and departed from the bus. It minimalizes the paper wastage and makes the process expeditious. Thus, it also promotes the governments mission of Digital India and Smart India.*

Keywords: *GPS, Automation, Digitization, RFID, App GUI*

1. Introduction

This project marqre the automation for both end-users (passengers) and transport corporation. In prevailing system, the transit system uses the manual process for the ticketing. The passenger and conductor must go through the tedious task of printing the paper ticket and commuter must preserve the tickets till end of journey. The 46 million tons of the paper wastage are produced due to paper wastage. Around 18% of the population uses public transport to reach the workplaces. These population is a GDP generating. The problems in the transit system are inordinate waiting time, inadequate time for tickets, non-refund for not travelled journey, use of cash of purchasing tickets, inefficient overall system arrangement.

To subdue the above-mentioned problems, we tendered an easy to use, friendly system. In the system, the bus locator is enabled which will convey a real time position of the bus to the passenger through an app. So that the user can easily get acknowledgement of the boarding point of bus through GPS system located in the bus. Then at time of entering the bus the passenger count will be counted through the scanner. The data will be stored in the database with respect to the scanned QR code of user's profile in RFID scanner. The user fills up the whole information including count of passenger, age etc. The ticket amount will be generated automatically by the system and the amount will be deducted from the linked user account of the system. To avoid the discrepancy of bank server failure we also have an option of app wallet which serves backup account. Thus, it brings transparency, accountability in ticketing system and reduces the paper wastage.

2. Literature Survey

It builds an app-based portal which is built for operations of the database, ticket booking, tracking bus. It uses modern ITC tools to revamp customer relationship management. The additional functionalities including email to send tickets, notifications to users, online payment for the ease of payment. It enhances the Graphic User Interface (GUI) interactions and the checking of seat availability to take better decisions for user. The special cancellation module adds to the accountability of system. [2-3]

RFID system digitalizes the bus ticketing system by meeting up the most user requirements. The basic needs of the system encompass source location, destination,

travelled distance, number of passengers, cancelled route for travel. The needs are satisfied by the RFID system. The electromagnetic waves carry the information encoded in the Tags and smart cards. The major objectives like tracking the bus and automating the ticketing system are met. [2-4][7]

The transit system is regarded as lifeline of any developing country. E-ticketing is revolutionizing the manual ticketing system. The data of the seat availability, location of bus, starting point and end point are stored in DBMS. The basis user requests like login, checking seats, booking, payments are performed through GUI. The system will authenticate the user. Authentication allows the end-to-end encrypted transfer of the data. The relational database used in the system makes system design friendly and easily upgradable. [2-4][6]

In the papers we observed that GPS technology used is used to track the real time location of the bus in the system. The GPS is employed to provide cheapest routes and shortest travel time during heavy traffic timings. This system makes system economical and user friendly. It saves the delays in the routine of the transit systems.[3]

The issue of resolving the network connectivity is solved in the paper. The WI Rovers system establishes the Wi-Fi hotspots for the utilizations of the users. The outline and administration of the system are availed. Individuals can easily get access of networks during confined range only. The zones are specified at various locations to provide network.[5]

The authors suggested that the online booking service providers must provide the services as per the customer requirements. The personal information about the customer, travel information must be kept confidential and security is to be maintained. Still gaining the trust of users is a challenge. The statistical methods like mean, standard deviation and ANOVA are used to correlate the collected data. Recent pandemic like situations occurred during COVID-19 bought major changes in the transit system. We are not sure about the upcoming pandemics or any other dangers. So, the transit system can be used as contract tracing at those times. The extra reliability on private cars increases the contribution to the air pollution, increased non- renewable fuel consumption. Those factors are also considered. [1-2][4]

2.1 Abbreviations and Acronyms

RFID- Radio Frequency Identification,
 GPS- Global Positioning System,
 COVID- Corona Virus Disease,
 GDP- Gross Domestic Product,
 Wi-Fi- Wireless Fidelity,
 ANOVA- Analysis of Variance,
 DBMS- Database Management System,
 GUI- Graphical User Interface,
 ITC- Information Telecommunication,
 QR- Quick response

2. Objectives

The proposed system deals with mainly two objectives. One of the objectives being reducing the time efforts for manual ticketing process. Another being promoting the missions of government “Clean India Mission” by reducing the paper wastage for tickets thus reducing pollution. The system also complements the Digital India mission. The transparency and accountability are maintained by automating the process.

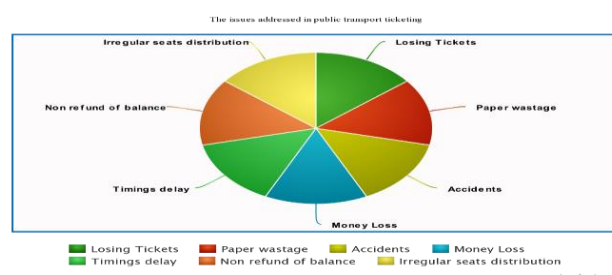


Figure 1 Problems in Tradional Ticketing

3. Methodology

The proposed system mainly deals with the two entities which are the main parts of the system.

- 1) User with smartphones
- 2) User without smartphones

Initially users will surf through the online tutorial briefing whole system briefly if user is new.

STEP 1) The user will look for the track which is to be travelled for the journey. After finding the exact bus user will find the nearest source for entering in the bus.

STEP 2) At the source station after arrival of bus user will enter the bus through the doors which has inbuilt face detector which will detect the number of passengers entering the bus.

STEP 3) The face detector details will be stored in relational database with respect to the QR code scanned using mobile.

STEP 4) The passenger after getting onboarded into the bus will go on the app-based portal where user will enter the basic information like name of passenger, count of passenger, age, destination etc.

STEP 5) The fare will be automatically generated by system. The amount of ticket will be directly paid through the linked bank account or the wallet in case the bank server is down.

STEP 6) After paying the amount of ticket the same QR code will be updated.

STEP 7) At the time of leaving the bus the user will again scan the QR code with scanner. This scan ensures that proper billing is done by cross checking the count of passengers at the time of entering.

STEP 8) If everything is fine the door will be opened and passenger will get out of the bus.

STEP 9) Now all the data will be stored in the database. The data will be analysed with the help of ML and AI technologies to gain insights of the pattern which helps in making more profit from the system. The emergency situations can also use these details for tracing the contracts.

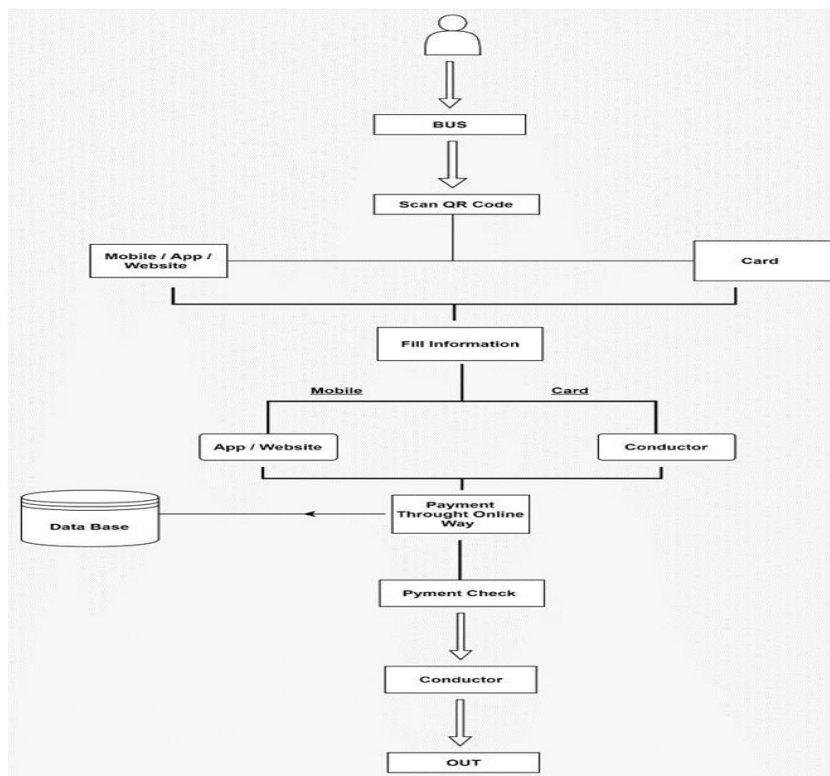


Figure 2 Flow Diagram for Process

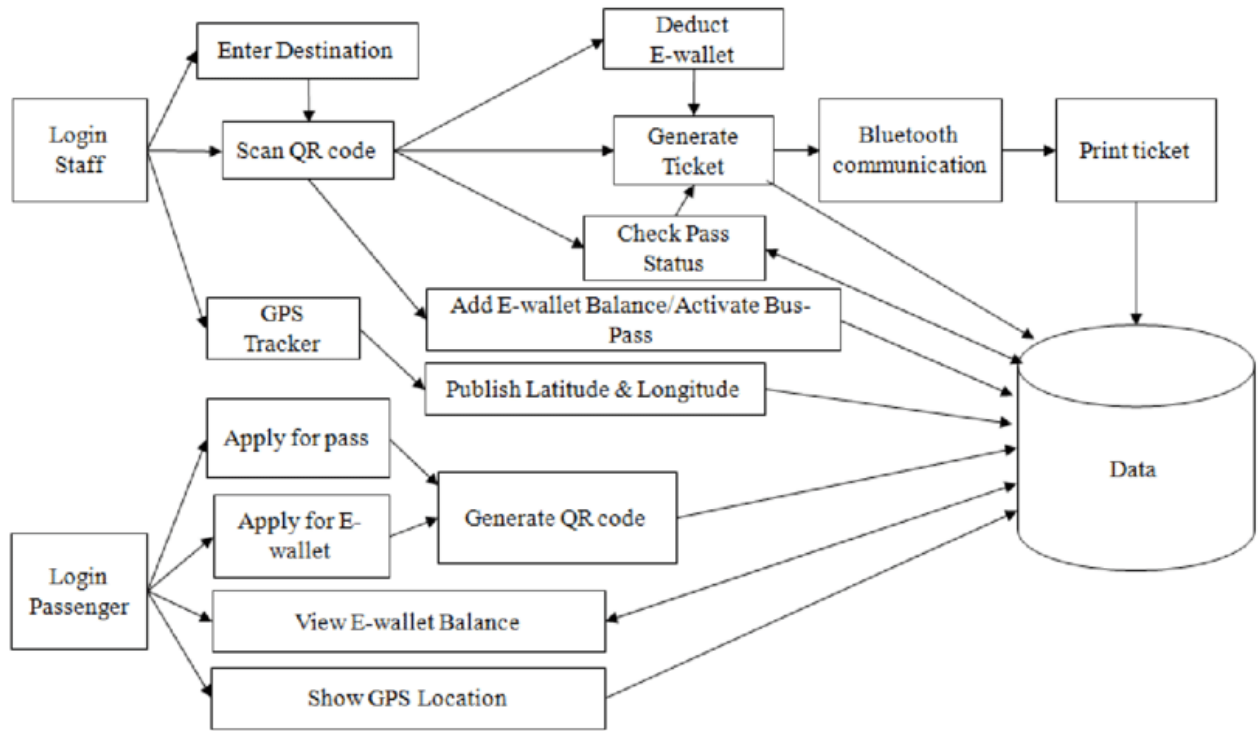


Figure 3 Architecture

4. Expected Outcomes

This project will be having a well-established and government helping interface for clearing discrepancies in the ticket booking system in the “Indian Bus System.” It will reduce time and paper wastage; thus, this system will lead to an “Eco-Friendly environment” this system will be user-friendly, and any user who has sound knowledge of any kind of interactive interface will be able to use it. In a situation like a pandemic, it will help reduce the contact of a person. Thus, it can also act as a model for contact tracing of victims. It will make a revolutionary change in the civic life of minor cities also.

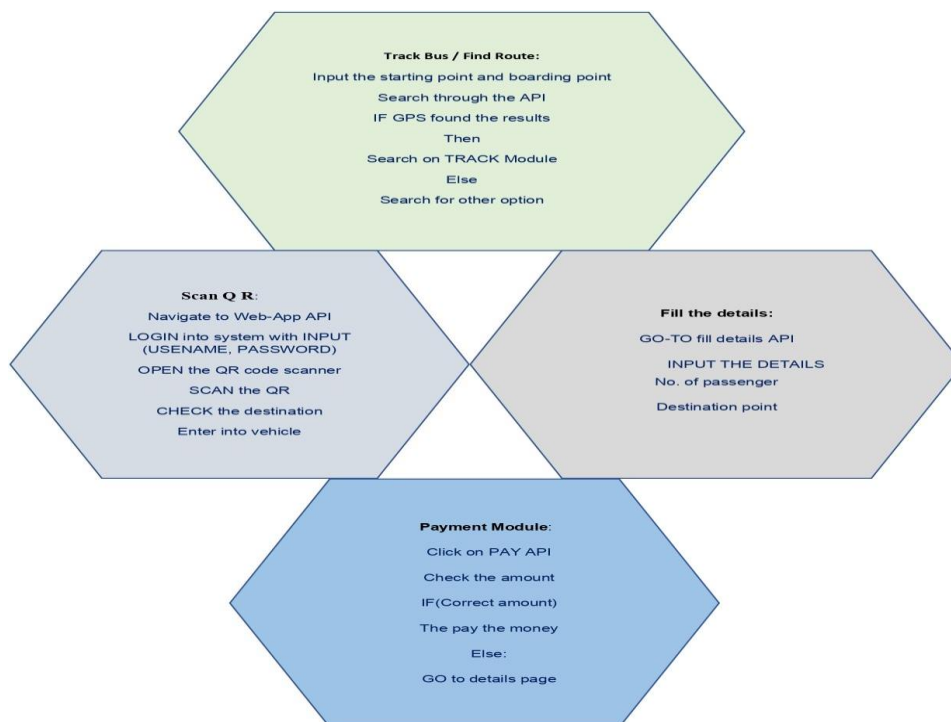


Figure 4 Algorithms

5. Future Scope

This project has a wide scope for the future development, as the user requirements is always going to be changed which is not static and these needs are dynamic. The technology which is famous today becomes outdated in very next day. In the future, we will be adding ML/AI technologies for enhanced usability and to maintain transparency. Will be increasing its reliability and security by making the transporting vehicles full of network facilities. For the same proposed system, we will be making the mobile application too, so that it becomes user-friendly. We will make this interface handy and easy to use. It can be also used as a national security mission. We also have an assurance of passenger security. To make our system more user-friendly we will provide a tutorial for usage of this system

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