

Smart E-Ticketing System

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Abstract:- The conductor gives the ticket in the traditional transportation system. The entire process is essentially paper-based and tickets are provided on printed papers. Both the amount of money received and the distance traveled by passengers are manually calculated. The cashless system, which makes use of QR Code, is widely used in several countries. In order to replace the manual fare collecting method and increase the efficiency of fare collection, the Transit Smart Card method, a new and innovative Automatic Fare collecting (AFC) System, is introduced in this work. The bus card or the QR reader can be used by passengers in place of a bus ticket. The QR scanner instructs the travelers on how to create an account, connect their band details to the app, and load funds into their wallet. The allocated and collected ticket fare is based on the user's selected destination. The passenger receives an SMS notification with a confirmation of the ticket payment. When a traveler arrives at their destination, the door will open if they scan their ticket to verify they have a ticket. Additionally, the printed materials will be reduced, and the loss of the card is also eliminated. It would ensure that tedious and financial problems like change are kept to a minimum.

Keywords: QR Code, Automatic Fare Collection, Online Payment, Cashless System, Transit Smart Card

1. Introduction

Buses are the most widely used kind of public transit in many places nowadays. Typically, an E-Ticket is referred to as a transit card or a travel card. E-Ticketing is used for public transportation buses in our suggested system. The popularity of E-ticketing systems has spread globally and public transportation will undoubtedly profit from these advancements in technology. The following information will be included on E-tickets: ticket number, bus number, place of departure, place of arrival, price, the number of tickets. In Smartphones or as an SMS in feature phones, an e-ticket will be generated. The bus routes include stops in between the locations and go from Tirunelveli to Madurai, Thoothukudi to Tirunelveli, Tirunelveli to Kovilpatti, Thoothukudi to Kovilpatti and vice versa. You can select the start point, destination, and fare by clicking generate QR. the process of paying is initiated by scanning the generated QR code. Debit/credit cards, UPI, and app wallets are all accepted for the e-ticketing payment process.

2. Literature Survey:

[1] Instead of using the ticket, users can scan the QR reader. Following registration, we link our bank account information to this app and add funds to the wallet. Detect the QR code. Therefore, depending on conductor ID, straight money will transfer from the wallet to the transportation firm. Then, you'll get an SMS notice requesting ticket payment documentation. Using a web application, the administrative side (Transport Corporation) determines the financial information for a certain conductor. Then, you can determine the Transport Corporation's daily amount statistics for buses.

[2] This application provides a useful online bus pass system and uses a database to record passenger data. It is incredibly helpful because it lowers paperwork, saves time, and streamlines processes. When a pass expires, the

user can renew it by extending the pass's validity. Users may obtain a pass at any time and any location. It creates monthly, annual and daily bus passes.

[3] Automated Fare Collection (AFC) system's widespread adoption creates a new opportunity. The stations and tap-in and tap-out timestamps for each trip are easily accessible from the AFC system records. A solution that uses only the AFC systems and no other machinery or personnel. Confirming the methodology with a large dataset collected via the Shenzhen metro station. The assessed outcomes offer beneficial inputs for developing for passenger path choice model.

[4] In order to protect QR code generators and users alike, this article builds a security architecture. The technique is backward compatible with the QR code encoding standard already in use. Utilizing a smartphone application built for Android, the system is developed and evaluated. It was found that the system somewhat increases the amount of time required for integrity verification and content certification.

3. Modules

WORKING PRINCIPLE:

The passenger must scan the QR code to obtain information about the journey specifics such as travel from, travel to, and fee. The obtained fare information are sent to the payment module.

HOW THE PROCESS IS CARRIED OUT?

The user confirms the plan by clicking the renew button and the app directs them to the payment screen, where they may complete their online payment using credit or debit card. It simply takes a few seconds to pay for the ticket, after which the app contacts the server and updates the data it has just bought.

SOFTWARE AND HARDWARE SYSTEM REQUIREMENTS:

SOFTWARE USED:

- Language : Java, Android
- Tool Kit : Android SDK Manager.
- IDE : Eclipse / Android Studio
- Frontend : Android
- Database : MySql

HARDWARE UDES:

- Processor : i5
- Ram : 4 GB
- Hard Disk : 500 GB
- Sensor : Ultrasonic sensor
- Near Field Communication Reader
- Ticket Vending Machine

SOFTWARE DESCRIPTION:

OVERVIEW OF ANDROID:

An operating system, middleware, and essential apps make up the Android mobile software stack. The Java programming interfaces and necessary tools needed to begin developing Android applications are included in the Android SDK. Easily facilitates mobile development; provides a complete phone software stack with applications; to serve as a framework for the creation of software. It is Accessible.

LINUX KERNEL:

- Memory management
- Process management

-
- ```

graph TD
 Start([Activity starts]) --> onCreate[onCreate()]
 onCreate --> onStart[onStart()]
 onStart --> onResume[onResume()]
 onResume --> Running([Activity is running])
 Running -- "Another activity comes in front of the activity" --> onPause[onPause()]
 Running -- "The activity comes to the foreground" --> onRestart[onRestart()]
 onPause -- "The activity is no longer visible" --> onStop[onStop()]
 onStop --> onDestroy[onDestroy()]
 onRestart -- "The activity comes to the foreground" --> onResume
 onDestroy --> Shutdown([Activity is shut down])
 UserBack([User navigates back to the activity]) --> onRestart
 ProcessKilled([Process is killed]) --> onDestroy

```

- ## ARCHITECTURE:

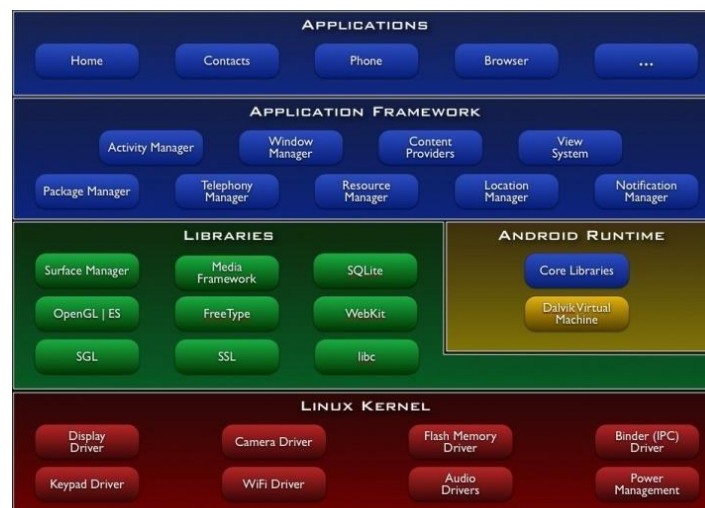


FIG 1: ARCHITECTURE

- **Android Emulator:** This computer-based virtual mobile device allows us to develop, test, and debug our apps in a real Android setting.
- The Eclipse unified workspace gains significant improvements from the Android Development Tools Plugin.
- **Dalvik Debug Monitor Service (DDMS):** This Dalvik-integrated utility helps with debugging and lets us manage processes on an emulator.
- Android package files (.apk) are created for distribution using the Android Asset Packaging Tool (AAPT).

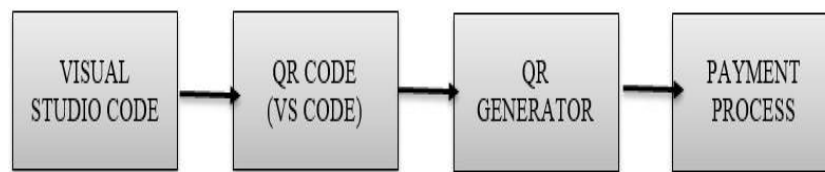
**LIFECYCLE OF ACTIVITY:**

54

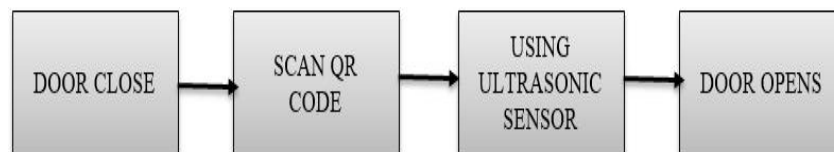
**MYSQL-BACKEND:**

MySQL Enterprise provides extensive services and support. A vast knowledge base library of hundreds of technical articles covering typical database problems like performance, replication, and migration is another feature that MySQL Enterprise provides.

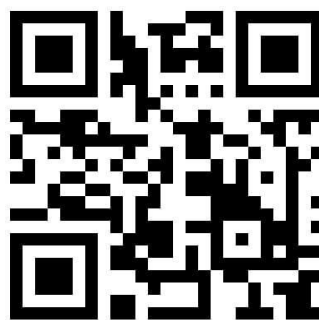
MySQL AB develops and manages a range of affordable, high-performance database products. The company's flagship product, "MySQL Enterprise," comes with proactive monitoring tools, production tested software, and first-rate support services. The most popular open source database program worldwide is called MySQL.

**4. Methodology:****CODING OF E-TICKETING PROCESS:****FIG 3: CODING OF E-TICKETING PROCESS**

QR Code is generated using visual studio code. After creating the QR Code, the following payment-processing phase is programmed.

**MANUAL OF E-TICKETING PROCESS:****FIG 4: MANUAL OF E-TICKETING PROCESS**

The door is initially closed when entering the bus, and then after scanning the generated QR accepting payment, the door is then opened.

**5. Results****FIG 5: GENERATED QR CODE**

The start location, destination, and fare must be chosen in order to generate the QR code; after that, by clicking Go to Pay, the payment process will begin; after providing the account details, the account data will be confirmed, and the payment confirmation will be displayed.

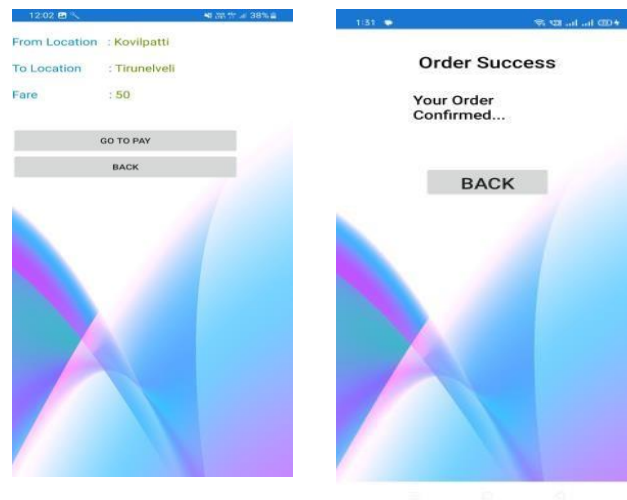


FIG 6: LOCATION AND PAYMENT

## 6. Conclusions

This module focuses on smartphone-based GPS tracking data. A set of properties, such as GPS mapping, are derived to define the trip state of the Smartphone bearer. In the current method of delivering Bus Ticket, the passenger has to wait for a long time before the stage closure and has to wait in queue to receive the pass. It also aids in the digitalization of India. In future, Eticketing systems will be available to everyone, including people with disabilities.

## 7. List of Abbreviations

- |    |       |                              |
|----|-------|------------------------------|
| 1  | QR    | Quick Response Code          |
| 2  | AFC   | Automatic Fare Collection    |
| 3  | SMS   | Short Message Service        |
| 4  | ID    | Identity Document            |
| 5  | SDK   | Software Development Kit     |
| 6  | DDMS  | Dalvik Debug Monitor Service |
| 7  | AAPT  | Android Asset Packaging Tool |
| 8  | ADB   | Android Debug Bridge         |
| 9  | MySQL | My Structured Query Language |
| 10 | GPS   | Global Positioning System    |

## 8. Declaration

### Availability of data and materials:

This article doesn't contain any dataset. It was Not applicable

### Competing interests:

The authors have no relevant financial or non-financial interest to disclose

### Funding:

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### Authors' Contributions:

One member is assigned to backend development and API integration. Next person is responsible for designing the user interface for mobile application. Other one is building the mobile ticketing application. Then the other person is for security specialist.

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