Mobile based Bus Ticketing System

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Abstract- *This paper deals with the android application for ticket reservation and validation in buses. One of the major challenges in the current ticketing facility is buying ticket in the bus. Our application provides the facility for purchasing the tickets and paying through e-wallet. The ticket can be purchased with the help of Smartphone application. The ticket information of the user is stored in database. It uses the Smartphone facility to validate the ticket. The application stores the history of the passenger as well.*

Keywords- Android, Ticketing, Bus, e-wallet

I. INTRODUCTION

As technology starts growing we need to update ourselves to current trends and our upcoming generations looking forward for necessary services in one touch. The current system of taking tickets in the buses and paying for the ticket is a tedious process. It takes a long time for taking bus tickets and waiting when the conductor will come to the passenger. The current system of taking tickets for larger crowd leads to mismanagement. This increases increase in time delay for passengers, loss of money for the organization running the bus and more work for conductor as well. Mobile based Bus Ticketing System can be used to book tickets on the go and pay for the same through smart phone, which helps people of all generation. This system provides connection between online server, where data is managed and android app, which provides a GUI for the user as well as conductor. This helps in avoiding delay due to ticketing and waiting in bus and helps in tracking user history. In addition to it, the application also provides a user tracking facility of his travel history.

A. On-the-go Issuing

This application can be used to book tickets with complete flexibility and easy and hassle-free method. The application allows easy payment through internally built e-wallet. User can book tickets for more than one person at a time. Also, KYC details of the user is maintained, thus helps us in tracking any user activity anytime.

B. E-wallet

E-wallet is internally built wallet created in the application to add/pay money. E-wallet allows the user to travel cashless without any tension of change. Digital wallets are available to consumers at no charge. The application can also be linked other e-wallets that are already available in the market and are quite popular.

C. QR code[1]

Quick Response code(QR code) is or a type of matrix barcode (or two-dimensional barcode). A barcode is a machine-readable label that contains information about the item to which it is attached. A QR code uses four standardized encoding modes (numeric, alphanumeric) to efficiently store data and retrieve data. QR codes is used on various mobile device operating systems. These devices support URL redirection, which helps QR codes to send metadata to existing applications on the device. Many free or paid apps are available that have the ability to scan the codes and hard-link to an external URL.

D. OTP[2]

A one-time password (OTP) is a generated set of random numeric or alphanumeric strings that authenticates the user for a single transaction or session, on a computer system or other digital device like smart phones. OTP is used in the application to authorize user payment.

E. Google Firebase[3]

The Firebase Realtime Database is a cloud-hosted database. Data is stored as JSON. It is synchronized in realtime to every connected client. It can help in building cross-platform apps with iOS, Android, and JavaScript SDKs and they all can share one Realtime Database instance and automatically receive updates with the newest data. Firebase is a mobile and web application platform. It has tools designed to help and allow developers build high-quality apps.

II. LITERATURE SURVEY

Table 1.

Name	Year	Author	Description
Smartphone Application for Ticket Reservation and Validation Using Mobile Network[4]	2014	Pranjali kharwade, Isha gujarkar, Vidhi Sharma, Shweta Holey, Vaibhavi Datey, Vivek Gupta	Android, Cloud Database, MySQL
Android Application for Ticket Booking and Ticket Checking in Suburban Railways[5]	2015	Subarnarekha Ghosal, Shalini Chaturvedi, Akshay Taywade and N. Jaisankar	Android, SQLite, QR code
Bus Pass and Ticket automation System[5]	2016	P.Sharmila ,A.Ponmalar, Skanda Gurunathan R	Android, Cloud Database, Online Payment

III. PROPOSED SYSTEM

The proposed application is designed in such a way that it allows both passenger and conductor to login through a common android application.

A.   Hardware Requirements

The Hardware requirements for the application are:

- Smart phone with minimum 2GB RAM and 16GB Internal Memory
- A computer system with minimum 4GB RAM and 500GB HDD.

B.   Software Requirements

The software required for the application are:
- Windows 7 OS on computer system
- Android 5.1.1 OS on smart phone
- Firebase

C.   Android SDK

Android SDK or Android Software Development Kit is a package which includes a set of libraries, a debugger, documentation, a QEMU based handset emulator, tutorials,

sample code and many more. Recently Linux, certain versions of Mac OS and almost all versions of Windows after Windows XP are also supporting this kit. It is most suitable Android Development Tools (ADT).

D.   SQLite

SQLite is a relational database which is a popular specially is client server environment. It is used by a wide range of OS, browser and even Embedded Systems. It guarantees integrity amongst domains and thus is used as the local database of our project.
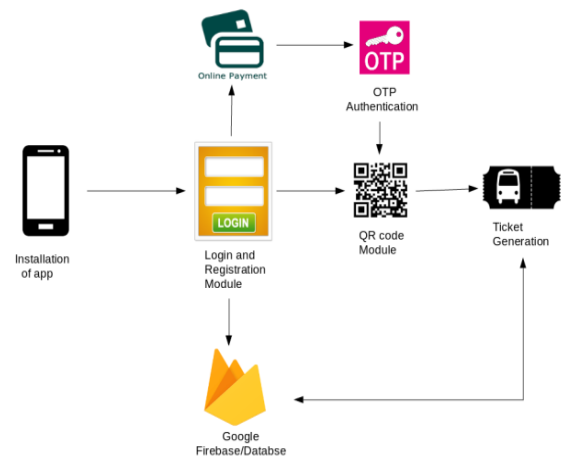

Figure 1. System Architecture

The application has a single login page for both passenger and conductor but different sign up pages for both of them. The details of passenger includes name, email, aadhaar number and mobile number. These values are uploaded in database i.e. Firebase. Some details like wallet and OTP are initialized to null values. The details of conductor is similar to passenger, except it contains conductor id. They both log in through same page. The authentication is provided by firebase. The application also has SQLite database so that the users do not have to log in again and again.

Once the conductor logs in, his dashboard appears. Through the dashboard, the conductor can enter the route number and start booking ticket. The passenger dashboard comprises of generate ticket, previous history.
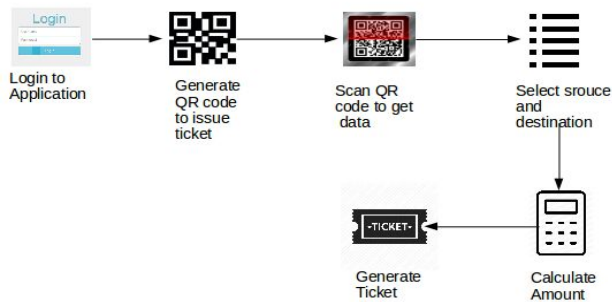
IV. PROCESS OF ISSUING TICKET

Figure 2. Issuing Process

For booking ticket, the conductor manually enters the source and destination for the passenger on his end. The passenger chooses the generate ticket option and adds the number of adults and children travelling along with him. He then chooses to generate OTP. A QR code is generated which comprises of the passenger name, his email, mobile number, the number of passengers, his aadhaar id and OTP. All these data is merged together using XML. The OTP is generated by a random function and is of six digits. The conductor scans this QR code and the amount is calculated based on simple calculations. The OTP signifies the user's discretion to deduct the amount from his account.
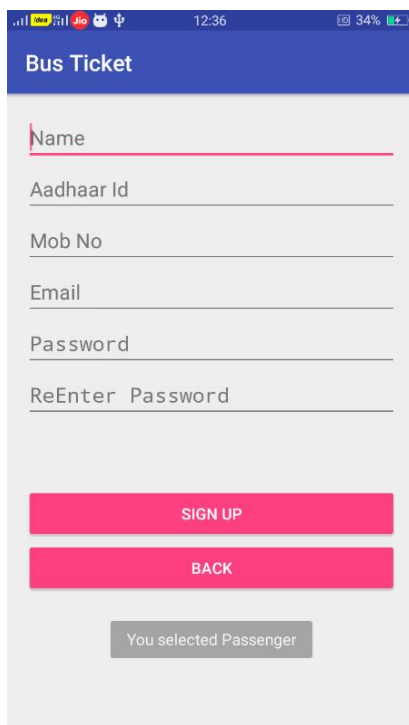
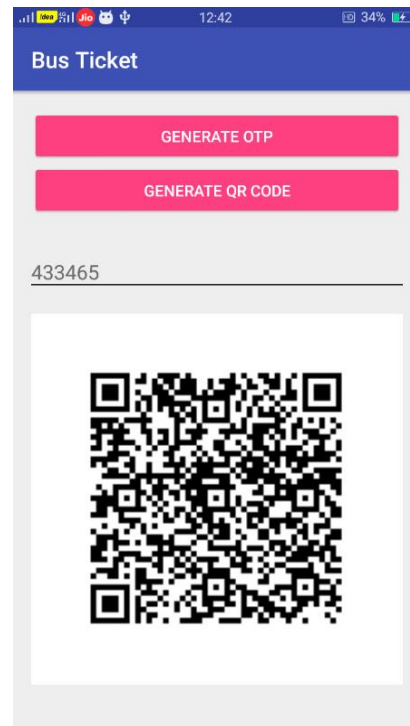## V. RESULTS

Figure 3. Sign up

Figure 4. OTP and QR generation
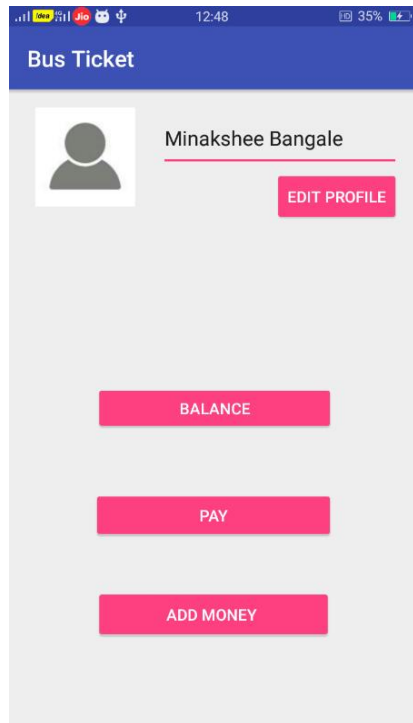

Figure 5. Ticket Generation

Figure 6. E-Wallet

VI. CONCLUSION

This proposed system can prove to be reliable at several places such as there would no need to carry hard cash all the time. Also, it becomes easier for conductor to calculate number of passengers or the amount collected during the day in just one click. The application also help user in tracking his activity. Till now, there is no KYC method proposed in city bus travel. So this application can act as boon. Firebase provides safe, secure and real time data.

VII. ACKNOWLEDGEMENT

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