

Smart Bus Pass System Using Android

Mohammed Furkhan^{1*}, H. R. Divakar²

¹PG Scholar (MCA), Department of MCA, P.E.S. College of Engineering, Mandya, India

²Associate Professor, Department of MCA, P.E.S. College of Engineering, Mandya, India

Abstract: Over the last few decades, there has been an increase in the use of public transport like social travel (ST). Applying for or renewing a bus pass takes time because of the current bus ticketing system. Passengers have to stand in line at Depo for long time to obtain bus permits. During peak hours, both passengers and staff experience longer delays, which hurts both sides. The Smart Bus Pass System is advantageous to all age groups because it allows for mobile ticket purchasing as well as the application and renewal of bus tickets through Internet. This technology connects to a Database where data is controlled with an Android app that acts as the user's graphical user interface. By doing this, users can be alerted when their bus pass is due to expire and bus delays brought on by ticketing and long queues at bus stops can be avoided. This system minimizes conductors overhead of identifying the person as well as Student overhead of carrying bus pass as information is available in QR code.

Keywords: Database, Internet, Social travel (ST), QR code.

1. Introduction

To apply for new bus pass and renew old ones, users must download the Smart Bus pass System mobile app for Android. By making a payment online, users of the system can apply for new bus pass as well as renew existing ones. A QR code for the bus pass that contains encrypted data is given to the customer after the transaction is finished. The user can prolong the pass's validity to renew it once it expires. As a result, using pass services no longer requires a trip to a bus terminal. This software notifies the user when their bus pass is about to expire as well. The programme is therefore flexible and simple to use.

Every bus transportation A Quick Response Code is a two-dimensional array that uses an alphanumeric code that can be read by an optical scanner, which is frequently included in or developed for other devices like a mobile phone or tablet. Due to its easy readability, low production costs for the actual codes, compatibility with different medium (paper, cardboard, etc.), and capacity to hold a sizable quantity of data, the QR Code technology, which was first utilized in the automobile industry, has quickly extended to other industries. QR code contain the student information like Student id, name, source to destination, pass validity. This system is cost effective over all the systems.

Whenever bus conductor asks for the pass Student just has to present the QR code which conductor will scan to get details. The Conductor Profile has button that starts camera for scanning the QR code. Whenever system scan the QR code, on screen conductor can see all the information about student like

name, id, source and destination and validity. This product will be of great help to government and Mother Nature for reducing

the uses of paper in a large extend. This Application is also helpful for bus conductor to reduce the effort to find the correct owner of the pass and also passenger, need not carry paper-based bus pass.

2. Literature Survey

Mohini S. Shirsath and Pooja M [1] proposes a system that includes IOT technology where GSM module is placed on the bus that tracks the location of the bus and informs the user about the current location of the bus, it also includes web portal for admin to monitor the GSM module. This application overcomes the issue of waiting time in bus stops as the location of the bus can be known easily, as GSM module is included in the application accurate location of bus can be known. The drawbacks of this application are, it does not solve the real time problem of bus ticketing as it is the main problem faced by the passengers, the manual process of existing system is carried in the application for bus ticketing, it also does not provide an integrated interface for passenger and admin, this application also fails to provide an interface to conductor and also conductor has no role to play in the application.

Nwakanma et al., [2] proposes a system that helps passengers to reserve tickets online by providing a web portal, here passengers can login into the web portal and reserve tickets for the journey, this application provides user friendly interface for users while reserving tickets, This application only concentrates on solving the problem of ticket reservation, and also it is of no help for the passengers who travel on daily basis, this application also does not solve the problem of reducing the paper work, it also does not include an integrated application for passenger, admin and here conductor has no role to play as the manual process of existing system is carried out in the application. Also, the application does not provide a greater number of users as the number of users is restricted to 20. The application, sends emails to the passenger once the tickets are reserved hence passenger has to carry the physical ticket.

Dhruv Mehra and Jay Gangadia [3] proposes a system that involves providing bus pass to passengers via email once the registration process is carried out. This application solves the problem of reducing paper work by providing the bus ticket in the form of QR code to the passengers. The application also eradicated the manual process of existing system of standing in

*Corresponding author: furkhan0076@gmail.com

long queues and waiting for bus pass for stipulated time, and problem of carrying physical ticket that creates more possibilities of pass getting misplaced or damaged, however this application fails to provide an integrated interface for user, admin and conductor, conductor has to use third party QR code scanner apps to scan the QR code and also the conductor does not have any interface in the application as a result admin has no control over the actions of conductor.

Parashuram Baraki and Sandhya Kulkarni [4] proposes a system that includes bus pass generation with QR Code scheme which is a database-driven solution for managing bus pass information. People can get their bus passes online by using the web application provided by this scheme. People should obtain their bus passes electronically rather than standing in long queues. This approach reduces documentation, saves time, and allows the customer to access a bus pass quickly and easily. It's designed to be a low-cost way to keep track of bus pass information by using a QR code. The system has two logins: one for the user and one for the administrator. The controller has access to all of the user details across the account. Each user access would have a QR code that includes the user's details as well as the pass's validity. This application solves the problem of manual ticketing process as it involves generating QR code-based bus pass online, however as this is a web application it provides QR code to the passenger through registered email id hence integrated interface is not available.

Anurag Sharma and Amit Sharma [5] proposes a system that aims to provide an effective solution for an interactive web-based bus pass creation system for college students. This system will simply require their personal details with confidential pin for authentication purpose, which student has to buy from the DTC bus depot or college office. The system can be accessed by a student at any time. This system will also allow the student to renew his/her card. However, there will be a penalty of a minimal amount in case of loss. In addition to this, to identify the fake bus pass users, the beholder of the pass must carry his/her i-card for verification purposes while traveling. This application provides bus ticket in the form of card, passenger has to carry the i-card, hence the possibilities of card getting damaged or misplaced are high.

Vasanta Sanga *et al.*, [6] proposes a system that aims to provide an effective solution for maintaining Bus pass information using a database. Online Bus pass generation is useful for people who are facing problems with the current manual work of bus pass registration and renewal. The system has two logins, one for user and other for admin. Online bus pass Generation system is a web application for people to get Bus passes through online. This system was intended to develop an application to perform functionalities like accessing the basic information for authentication and provide Bus pass to a particular person without placing him/her in a queue for a long time. This application involves passenger and admin entities and fails to provide conductor interface hence conductors have no role to play in the application as conductor entity has a manual process in the application.

The above literatures report certain flaws, as it is manual in nature and involves lot of paper work, it also involves

passengers spending lot of time in long queues, the existing system also has drawbacks as the bus pass is provided physically, it can be damaged or misplaced, once pass is damaged it is not considered valid, hence passenger has to go through long manual process of pass generation. The renewal process is also manual, passenger has to go through the similar process of pass generation even for the renewal process. A few Applications have been developed in similar way but lack certain features like QR code availability, interface for Conductor and passenger integrated in one application, QR code generation in the application. Some applications adapt manual process of the existing system and also does not solve the problem of reducing paper work as the pass is issued physically. The proposed system thus, minimizes these flaws by adding features like integrated interface for passenger, conductor and admin. It also provides QR code generation and QR scanning features in integrated application, as a result the system is enhanced and user friendly.

3. System Architecture



Fig. 1. System architecture

This application involves admin, conductor, passenger and their interaction with database. Here admin can add and delete conductors as well as passengers, admin also approves passenger when passenger registers for the pass. Conductor can manage the profile like adding or removing his/her Phone number, changing password, editing profile picture, conductor also scans the QR code presented by the passenger using the application. Passenger can manage his/her profile by editing details and passenger can also view previous payment activity, passenger can generate pass by applying for the pass once admin approves, passenger can also renew the old pass by completing the payment. Data generated is stored in SQLite database where all the records stored can be viewed as depicted in figure 1.

Flowchart Implementation:

The figure 2 depicts flow control of the application, it starts with Passenger Registers by submitting required details like name, phone number, username, password, and a document in form of a picture. Once the details are submitted passenger

waits until the admin approves by reviewing the details, if the details are valid flow proceeds else passenger has to re submit the details and wait for admins approval. Once the passenger is approved by admin passenger applies for the pass using valid username and password, entering details like Source, Destination, selecting type of the pass and completing payment online and generates ticket in the form of QR code. Conductor has interface in the application where he/she can login using the details provided by the admin once conductor has logged in, he/she scans the QR code presented by the passenger using scanner available in the application, if the details are valid process ends else passenger has to again fill all the necessary details, complete the payment and generate QR code to be scanned by conductor and get required details.

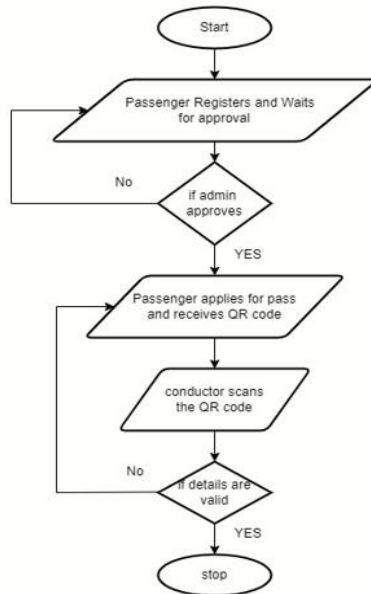


Fig. 2. Flowchart

4. Proposed Methodology

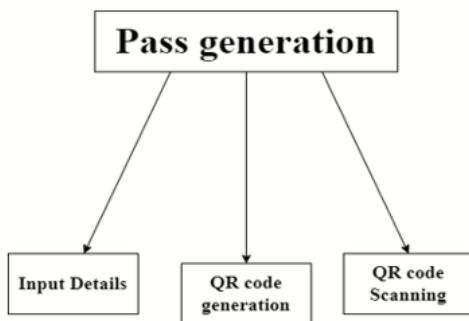


Fig. 3. Pass generation flow

The bus pass generation involves storing the details entered by user like source, destination, date, and type of pass, once the details are collected the text is encoded in a QR code using ZXing library by defining the properties like height, width and dimensions of QR code. QR code scanner is also integrated in the interface where conductor can scan the QR code using scanner available in the application. QR code scanner is also created using ZXing library where certain user defined

functions are used to provide permissions for starting and closing of the camera.

Benefits of the Proposed System:

- Passengers can use the app at any time and from any location.
- The passenger can purchase the pass online, seven days a week, 24 hours a day.
- The proposed application eliminates the problem of lost or stolen bus passes.
- The application eradicates the use of paper work as the process is done online.
- The conductor and passenger are under admins supervision where admin can have access of adding, deleting, approving the conductor and passenger.

5. Result and Analysis

The proposed system provides enhanced user interface by eliminating flaws present in existing system like existing system of bus pass generation is a manual process and involves paper work, hence the proposed system solves the problems faced by digitalizing the process. Proposed application is user friendly for admin, passenger as well as the conductor, as it provides enhancing interface and all the aspects integrated in one system. The application uses ZXing library for creating QR code scanner and also for generation of QR code which helps in providing external features included in the application for conductor and passenger. The ZXing library is one of the most efficient libraries as it provides 54.12% of reading rate for a QR code and 82.86% of reading rate on lots. The lots category has multiple QR codes in one image.

6. Conclusion

This is a real time system for those people who are facing the problem while carrying the physical bus pass, especially in the rainy season, where there is probability that pass gets damaged. Also, by analyzing the huge amount of paper use now a days. In our application we provide the QR Code as a bus pass which is available in the Application. So, both the problems get solved. For students and passengers who want to generate the pass online and avoid the issues with the present manual bus pass generation and renewal process, this Android application is helpful. Before the bus pass validity period expires, the app will send a message to the passengers.

References

- [1] Mohini S. Shirsath, Pooja M. Chinchole, Vaishnavi R. Mahajan, Varsha G. Mogal, "A Review on Smart Bus Ticketing System using QR-Code," 2021.
- [2] Nwakanma Cosmas, Etus Chukwuemeka, Ajere Ikenna, Agomuo, Uchechukwu, "Online Bus Ticket Reservation System. Statistics and Computing," 2015.
- [3] Dhruv Mehra, Jay Gangadia, Jeevan Ghag, Aayush Gupta "Bus Reservation System" 2021 International Research Journal of Engineering and technology.
- [4] P. Sharmila, A. Ponmalar, R. Skanda Gurunathan, "Bus Reservation System", 2020 International Journal of Computer Science and Information Technologies, vol. 6(3), 2020.

- [5] Anurag Sharma, Amit Sharma “Development of effective web-based bus pass generation” 2020 International Journal of sustainable development in computer science.
- [6] Vasanta Sanga, Pritvi Navale, Mayuri Shirke “Smart bus pass generation” 2021 International Research Journal of Engineering and technology.
- [7] Parashuram Barki, Sandhya Kulkarni, Spurthi Kulkarni, Arpita Goggi and “Development of an Effective Online Bus Pass Generation System for Transportation Service in Karnataka State,” 2021.
- [8] S. Chandurkar, S. Mugade, S. Sinha, M. Misal and P. Borekar, “Implementation of Real Time Bus Monitoring and Passenger Information System”, International Journal of Scientific and Research Publications, vol. 3, no. 5, 2013.
- [9] Pandimurugan, Rahul Mandviya, Abhinav Gadgil, Kumar Prakhar, Aditya Datar, “IoT based Smart Beekeeping Monitoring system for beekeepers in India”, Computing and Communications Technologies (ICCCT) 2021 4th International Conference on, pp. 65-70, 2021.
- [10] Hari Narasimhan, M., Reinhard Kenson, A.L., & Vigneshwari, S., “Smart Bus Management and Tracking System,” 2021.