

# Secure Bus Ticket Generation



L.Sujihelen, C.Senthilsingh, M.PavithraJyothi

**Abstract-** For the past years, using of public transport especially local buses has lost the number of passengers getting into the buses due to lack of bus availability, time constraints and change(Rupees) constraint. The objective of this application is to attract passengers by implementing new technologies like Android and Secure Key Generation instead of using old technologies like QR Scanners and RFID readers which has some security problems. It totally has two android applications one is Passenger application and another is for Conductor. Through Passenger application he/she has to generate a unique four digit code which will be valid for 3 minutes. The unique four digit code will be generated automatically in a Passenger application after logging in with details which they used while registering in the application. Whereas in Conductor application, Conductor has to enter the 4 digit code generated in a Passenger application in order to identify the passenger. Now conductor has to enter the Source and Destination location of the passenger and Number of passengers. The Fare will be calculated based on Number of passengers and Price from the source to destination which is the value already stored in a database by an administrator. This fare will be debited automatically from Passenger application wallet and Ticket will be generated with a ID which will be sent to passenger via a notification and an SMS.

**Keywords -** Bus Ticketing System, Conductor, OTP, Passenger, Secure code.

## I. INTRODUCTION

In past years public transport was one of the mostly used modes of transportation and even it is a major source of getting income for the government. But now due to growth of population people are facing several problems while using public transport such as Change for Rupees. The conductor has to face several problems while issuing the tickets and even the same thing happens for passengers[11]. So people stopped using the public transport and using some other source like private vehicles and own vehicles [4]. Due to this traffic problems are getting increased and waiting time at the signals is also increasing [12]. So to overcome from the above problems this new system can be used which can be used to generate the bus tickets automatically in a secured manner and deducting the fare from the passengers wallet based on number of passengers and distance travelling [5]. The unique four digit code generated in a Passenger application which will be valid for 3 to 4 minutes which will act as an Identifier of the passenger. This four digit code is the one which is used to identify the passenger so as to deduct the amount from the wallet.

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The amount will be debited from the passenger wallet and ticket will be generated only if the required sum of amount is present in the wallet otherwise it will display a message to the conductor saying the amount for the transaction is not available and it will ask the passenger to the load amount in order to perform the transaction [6]. Now using this data of the tickets generated which will be stored in a database, government can make analysis and make predictions to know what the routes that are busy at what times are and what are the buses that are free at what times. So that government can allocate the buses that are free in particular routes to the routes which are busy. So that people will not face issues while travelling which can make people attract again towards the use of public mode of transport instead of using the private vehicles and own transport which will reduce the traffic and reduce the waiting time at signals [3]. This will also prevent the highly populated areas from smoke pollution and noise pollution.

## II. EXISTING SYSTEM

These days providing bus ticket to a passenger by a conductor is a tedious process. Previous projects used QR code (Quick Response code), RFID(Radio Frequency Identification), NFC(Near Field Communication) and Bluetooth. These are also the smart ways to generate a ticket but each has some disadvantage [8].

A Ticket Vending Machine (TVM) which is self-serviced which has become a rapidly increasing most important distribution channel in the public transport system [9]. This system has replaced the traditional ticket counters where a person will give a ticket like a conductor giving a ticket in a Bus for each and every person who gets into the bus. The replacement of Ticket counters with TVM's make the passengers purely depending on the TVM's and standing as groups at the Machines to get a ticket which also leads to quarrels [10]. The prototype of the generation of TVM is in three phases where first phase deals with the analysis of context of use. Whereas the second phase deals about the Analysis of Requirements and Third phase deals with the testing on Hardware and Software. This prototype has met all the requirements of a group even though it requires some adjustments [1]. A system which used QR code scanner for connecting the Conductor and a Passenger via a Android application for collecting the ticket and to transfer the money automatically and IR sensor for detecting the number of passengers travelling by a bus which is used for the analysis of hours at which more passengers are travelling so that more buses can be allocated at that peak hours. But to scan a code passenger requires Smart phone which has good camera which have certain specifications for scanning the QR codes correctly. This also led to some fraud transaction by fake coders [2]. The system uses the RFID (Radio Frequency Identification) readers. It is purely reliable on hardware and less reliable on software.



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It is a device used for communication between devices which uses electromagnetic and electro static coupling in the radio magnetic electro spectrum. As it uses hardware devices only it is not more secure when compared to other devices. So it is losing its importance day by day due to its reliability on hardware. The disadvantage of using this is if a passenger lost his RFID card it can be used by other person as it doesn't require any security codes like OTP (One Time Passwords) as it is reliable on Hardware [7].

### III. PROPOSED SYSTEM

Generally every bus has a conductor to collect money from the passenger and to issue the ticket. Previously, printed paper tickets are used. So if a passenger wants to travel in a

bus he/she has to carry money with them even with an appropriate change required for a ticket. This process takes more time. Handheld machines are being used by conductors which are fast in generating a ticket when compared to previous printed tickets. So passenger has to carry the paper ticket from the time he/she receives the ticket until reaching the destination and also trained persons are required to use the handheld machines.

So to overcome this problem a new system is proposed, which uses a four digit unique pin which is generated in a passenger application which acts as an identifier of passenger for the conductor to make more secure shown in fig.1.

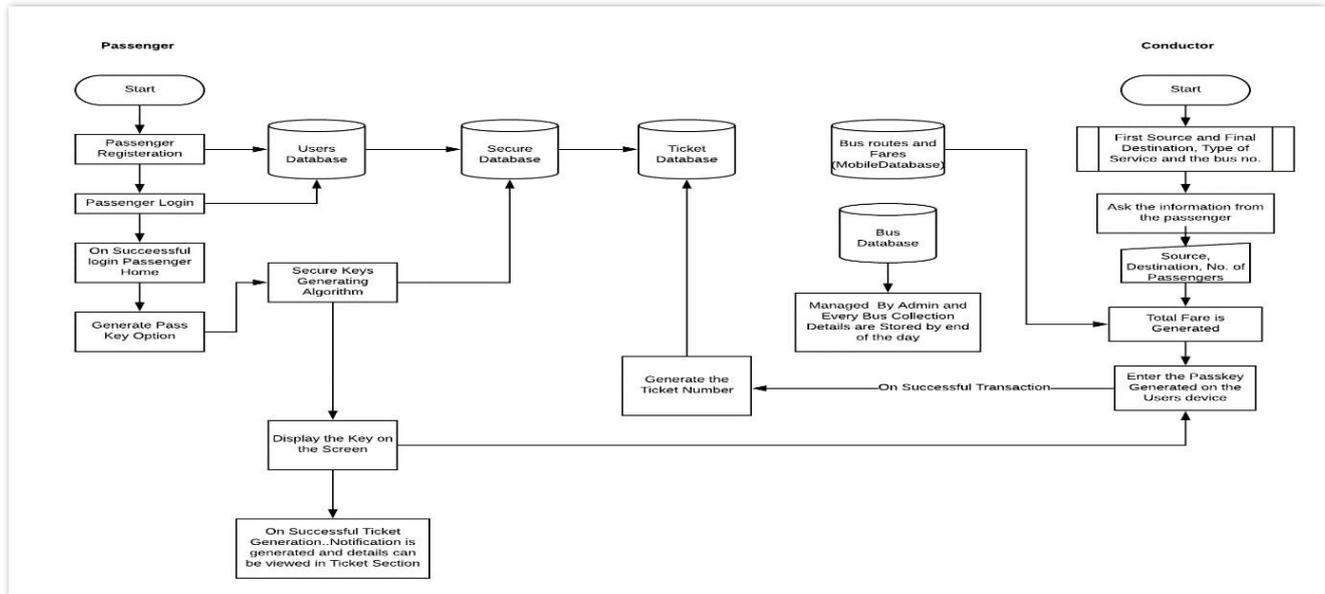


Fig.1 System Architecture

In a passenger application he/she has undergo registration process which allocates a username and password for the user. This username, password are used for authentication, to login and also to generate a four digit unique pin which is generated randomly and shows in the application if it is not actively existing in the database. If not it will generate another pin and this procedure is repeated until the unique pin gets generated. This pin will change for every 3 minutes to make the application more secure.

Now the passenger has to tell this unique pin to the conductor so that conductor application checks for the unique code. In the database through this it fetches the

details of the passenger/user. Now it takes to another screen in a conductor application where conductor has to enter the source, destination and Number of passengers. Now the amount is calculated, get debited from user wallet and generates a ticket and sent as a message to the user mobile number which is used during the registration process.

#### a. User Interface

The user application contains a interface with a registration page, login page and screen where the user can see the generated 4 digit unique pin and also a screen to see the tickets that has been booked previously.

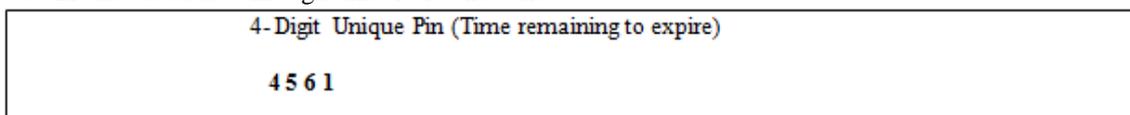


Fig.2 Pin Generation Screen

The four digit pin is refreshed for every 3 minutes that is another pin is generated in order to make the application more secure shown in Fig.2.

Here the conductor has to enter the pin generated in the passenger application to identify the user in order to eliminate discrepancy of amount getting debited from the wrong person wallet. Now after checking the pin and knowing the user it will ask the conductor to enter the source, destination and number of passengers. Now the fare is calculated and the

amount will be debited automatically from the passenger wallet and get credited into the Conductors wallet shown in Fig.3.

4-digit pin from passenger	Source	Destination	Number of passengers
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Fig.3 Conductor User Interface

IV. RESULTS AND DISCUSSIONS

The result of this proposed system is as follows:

First the user creates an account through the passenger application Registration interface by entering some basic details like Name, Mobile, Email Id and password shown in Fig.4 and Fig.5. If he/she already has an account then they can login into the account with the credentials. After the successful authentication it generates a Pin which has to reveal to the conductor for generation of ticket. The result is after conductor enters the Pin, Source, Destination and Number of passengers the fare will be deducted automatically from the user wallet and a notification with a Ticket ID is provided to the user shown in Fig.6.

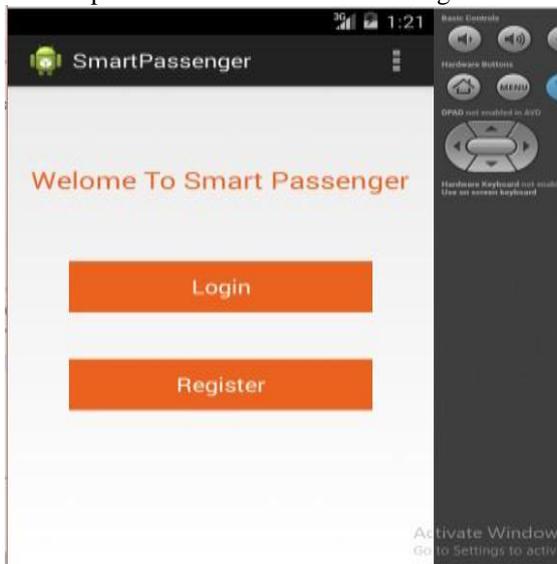


Fig.4 Login Details

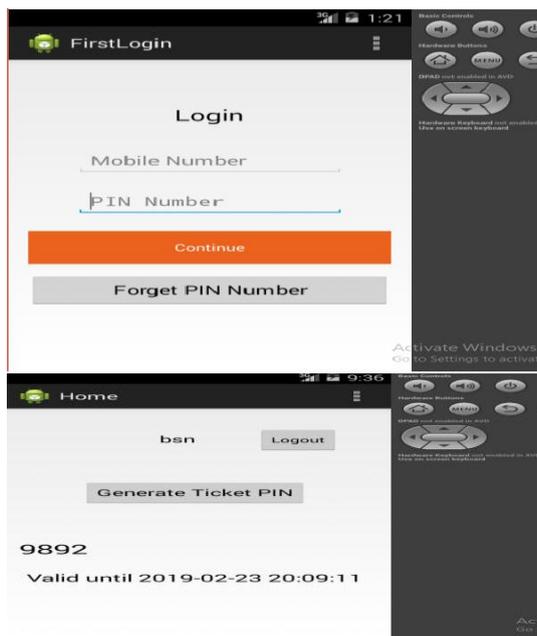


Fig.5 Login Verification



Fig.6 Fare Preview

V. CONCLUSION

This application will not keep the conductor job at a risk as it is not purely depending on the Passenger. All passenger need to do is getting digitalized by just having a smart phone in the hand with the application installed and registered. This would make the people often use the public transport as there is no work to be done by the passenger to use this application except login and generating a pin. This will eliminate the rush of passengers in a bus as this data is used for analysing the peak hours which then recommend the transport department to allocate more buses at this peak hours. It will make the passengers to move conveniently with this user- friendly system.

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