

SMART E-TICKET IN BUS USING QR CODE

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ABSTRACT:

Ticketing process is a tedious process that involves a lot of concentration in the part of the employee, who needs to take a note on the tickets issued between various bus stations(the region that is maintained for pricing) to the passengers getting inside the bus. The ticketing process gets even tougher if there is a number of passengers using the bus at the same time. In order to reduce the workload and avoid fraudulently, there has been an increased number of issues related to passengers traveling without tickets despite imposing strict laws. There is a need for an external checker who needs to check the passengers to reduce the fraudulent.Thus introducing a new method involving an E-Ticket is used it is generated in the form of QR code. The ticket consists of the information of the source, destination, and a number of tickets selected by the passenger. Then based on the information provided, the QR will be generated with a unique id. The payment is done through the wallet in the system. The wallet is created for every user who is registering in the system in order to handle the payments. The use of paper and cash in the existing system is replaced. There is a lot of disadvantages that is there in using the paper tickets where the tickets are easily damaged and it's not easy to keep track of them on the side of the passenger. The organization should invest in printing paper and with an increasing protest against destroying trees for paper and also the production of dye for coloring those papers are all against the environment. The Data is generated in large numbers, in the event of ticket vending and is used for analysis of the bus route preferred by the users/ or the routes that handle a large group of passengers. The in-built GPS available in the conductors' system is enabled and it allows the user to locate the bus using the information that is been collected from the conductor's device. The whole system works in a centralized data center sharing information from different data sources.

Keywords: *QR code,Tickets, e-Wallet, Public transportbus, Digitalization, Gps, Android application*

I.INTRODUCTION

Public transportation in many countries is being used as a means of transport for traveling. Accordingly, people would prefer public transportation. If scheduled properly, on time and the frequency is increased for commuters to make good use of it. Buses are the most preferred mode of public transport in both rural and urban India. 1.6 million Buses are registered in India, and the public bus sector operates 170,000 buses carrying roughly 70 million people per day [7]. Digitalization has been into almost everywhere in the current world. Most of the people use Android devices, with that everything has come in compact applications that provide the ease of process that we do in the day to day life. We are proposing a similar application that helps in the course of booking tickets in the local transport.The Jamaican Urban Transport Corporation uses an intelligent mobile bus tracking system as a case study that has been proposed which enables passengers towards tracking the bus of their choice and also to know their arrival times [1]. Having hundreds of vehicles in a public transportation system employ numerous resources to keep them functional and efficiently serving the public's needs. However, the efforts of these entities are thwarted by inappropriate trip scheduling, which sees the companies suffering substantial losses and commuters largely inconvenienced. Without adequate and proper scheduling, there are empty buses idly parked at termination points awaiting rigid departure times while potential passengers crowd bus stops due to unforeseen circumstances. This scenario results in having stranded passengers and a loss for the bus company in the form of wasted fuel and other resources. In addition to inappropriate trip scheduling, the issue of ticketing also is causing inconvenience to others who have planned for it properly. The application generates the QR code based on the information that is provided by the user. The amount for the travel is deducted from their respective e-Wallet. The user can choose the source and destination place. The user can choose the route based on their preference. The application generates one time valid QR code as an alternative for tickets. The QR is valid for a particular period of time is an alternative for bus-pass too.

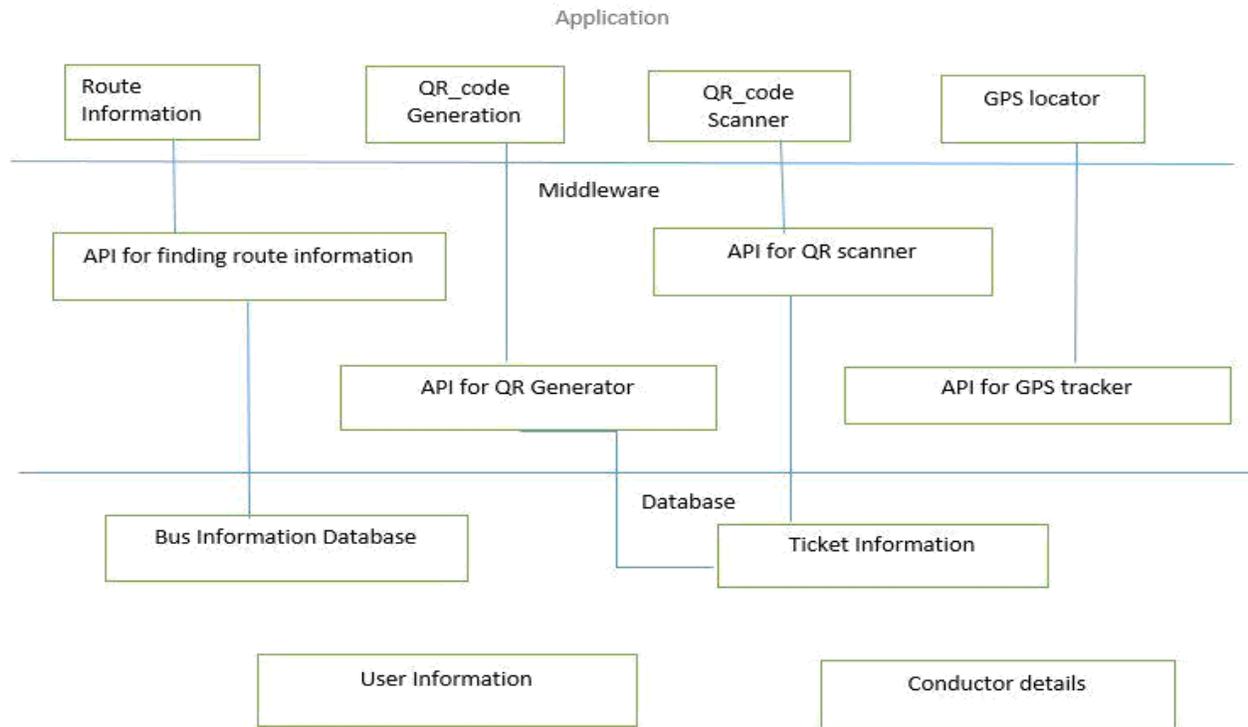


Fig: 1 System Architecture

The application also uses GPS to locate the bus. The GPS information on the bus is viewed by the user. In the future, the data from GPS is collected and analyzed to get the location and time information of the bus. Based on the collected data an intelligent system architecture can be developed towards tracking the bus and ticketing was proposed earlier which would pave the way for commuters not to rely on a static timetable of the bus or the burden of standing at bus stops looking for updates in the Display screen on the next bus arrival. The system that we have described earlier validates using Android in this research paper where commuters can use their Android-powered mobile handset to track the bus in their route from anywhere and knowing the expected arrival time of bus using GPS and also the reason for delay in bus arrival like traffic congestion, bus breakdown etc. by corresponding with the bus driver which are novel in the design. The bus company would keep tracking the movement of a bus based on information being communicated wirelessly to their application.

II. GENERATION OF QR CODE

The application generates the QR code and a unique number with the information provided by the user. The QR code is static in size [200sp x 200sp]. The QR takes the information, about the source and the destination. A QR code is generated after processing the payment. The cost of traveling from the source to the destination is fetched from the database, the amount will be deducted from the e-wallet in the application. QR Code employs error correction to generate a series of error correction code words which are added to the data code word sequence which enable symbol to be read even if it is dirty or damaged. The QR code achieves error-correction capability by applying Reed-Solomon codes. When selecting the level of error correction, as well as the desired size of the QR Code symbol, need to be taken under consideration. Each QR Code symbol shall be built of square modules arranged in a regular square array and it consists of function patterns and encoding region. The QR image is surrounded on all four sides by a quiet zone border. Function patterns are the shapes that is placed in specific areas of the QR code to ensure that QR code scanners can correctly identify and orientation of the code for decoding. There are 4 types of function patterns, they are separator, finder pattern, timing patterns, and alignment patterns.



Fig: 2 QR code

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Finder Pattern: Finder patterns are the position-detection patterns located in three corners (upper left, upper right, and lower left) of each QR code.

Separators: Separators are the one-module wide areas of whitespace between each finder pattern and encoding region in the QR code.

Timing Patterns: There are 2 timing patterns inside a QR image, i.e. horizontal timing pattern and vertical timing pattern, consisting of alternating dark and light modules. *Alignment Patterns:* An alignment pattern is constructed of 5×5 dark modules, 3×3 light modules and a single dark module in the center of the image.

Encoding Region: Encoding region contains format information, version information, data and error correction codes of the content.

Quiet Zone: It is a 4-module wide area containing null value, and it used to ensure that the surrounding text or markings should not misguide the QR code data.[2]

III. GPS

The Global Positioning System (GPS), is a navigation system that allows land, sea and airborne users to determine their current exact location and time 24 hours a day, in all conditions and anywhere in the world. It supports a broad range of military, commercial and consumer applications. In this application, GPS is used to find the location of the bus. The GPS information is sent to the user through the application. The user can view the location of the bus by choosing the route and bus number. This will help the user to locate the bus with timely information. GPS information is stored for data analysis. The data about bus timing and location will be analyzed to find the availability of the bus in the location. We can also find the number of buses passing in peak hours. The data analysis report will help the organization to improve bus availability when required.

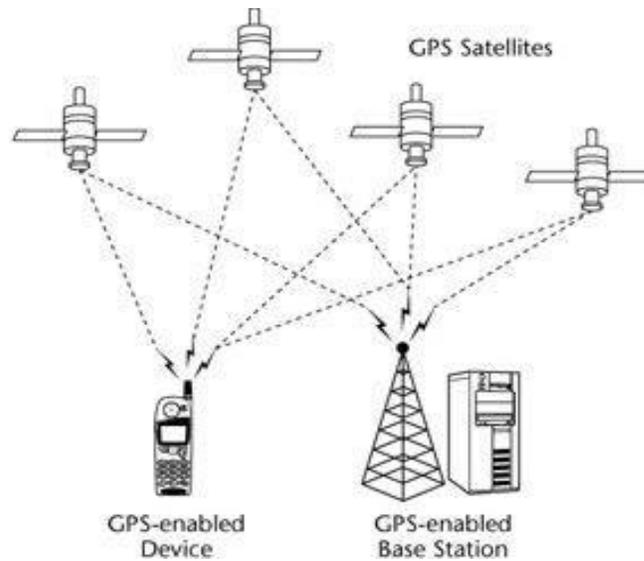


Fig: 3 Working of the GPS

IV. TRANSFERRING MONEY

The application allows the user to add the e-Wallet for transactions. Personal management of private/personal information concentrates on private/personal information in contrast to non-private information. Our eWallet can be considered a tool in a more comprehensive system for personnel management of private information. There are many types of eWallet available, they are 1) Mobile eWallet 2) Smart card 3) Computer eWallet 4) OtherWallet. Digital money is used while generating a QR code. The user can choose the e-banking method to attach with the application. The database will have the details about the amount to be collected for the particular source to destination.

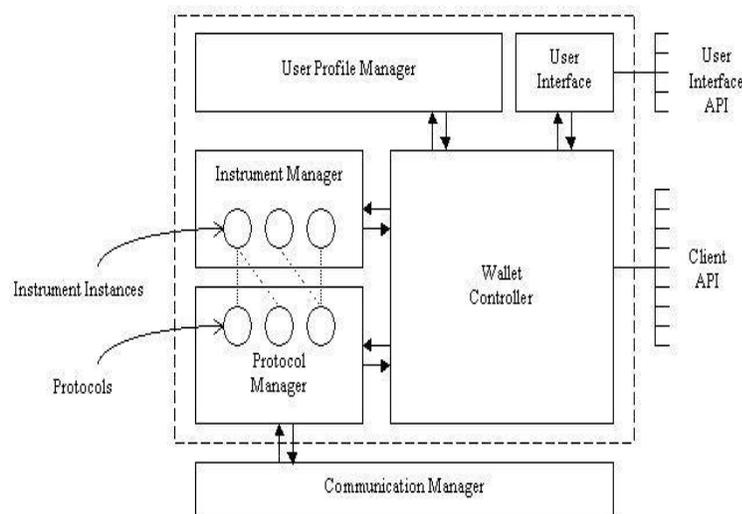


Fig:4 Wallet Architecture

The amount will be transmitted to the organization. Once the amount is collected from the passenger, the QR code will be generated and appear on the main screen of the application.

V. EXISTING MODEL

The existing system is a simple ticket vending machine which produces a paper-based ticket. The existing system needs manual effort to provide tickets and to collect the cash. The passengers suffer a delay while conductor issues tickets. Passengers also experience non-refundable balance amount. The system consumes passenger and conductor time. In the existing system, fraudulent activities can't be monitored by the conductor. Many people travel without buying the ticket on a crowded bus.



Fig:5 Ticket Vending Machine

VI. PROPOSED MODEL

Nowadays, due to the growing world & the importance of time in the day to day life, there is a need for effortless transport. So we are also providing an Android application which will provide the all system information of vehicle tracking and monitoring. It also provides the feature of location monitoring for the user convenience and nearest bus available on the route and will make the user up to date as bus moves. The location of the bus can be observed continuously using a GPS system. The GPS satellites transmit radio signals to a receiver. These receivers statically receive signals. GPS satellite transmits data that indicates the current location and current time of the vehicle or the device. The proposed model reduces the usage of paper. This application uses digital money for an easy transaction. The application also uses GPS to locate the bus. The GPS information is sent to both the organization and the application user. The application generates a QR code dynamically. This application reduces the time consumption to buy a ticket on a crowded bus. The conductor will have a machine with a QR code scanner which scans the passenger QR code. The machine will indicate that the QR code is valid or not. This application reduces the man effort to provide a ticket and to verify it. The bus-pass users can renew the QR code monthly/yearly based on their plan. This type of QR code is valid for one month/year. The QR code can be scanned only twice a day.

VII. CONCLUSION

The system will be efficient in helping the public transport system on a larger scale it saves both time and money. The fraudulence can be reduced in high ratio. The live tracking of the bus will be more helpful for the passengers. The route information gives an idea about the available bus-routes the user. The digitalization will help in transformation of the usage of the public transport by the people with more reliability and more time efficient.

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