

# AUTOMATIC BUS TICKET SYSTEM FOR PUBLIC TRANSPORTATION USING QR CODE

<sup>1</sup>Pratik Vijay Gurav, <sup>2</sup>Deshmukh S.C, <sup>3</sup>Mahesh Raju Hanchanale, <sup>4</sup>Prathamesh Ashok Chavan,  
<sup>2</sup>Asst. Professor, <sup>1,3,4</sup>Students, <sup>1,2,3,4</sup>Electronics & Telecommunication Department,  
<sup>1,2,3,4</sup>Sanjay Ghodawat Group of Institutions, Kolhapur, Maharashtra, India. 416 118

**Abstract :** Today transportation is the cheapest, so it has always been popular with the masses. The progress in the transport system has increased in everyday life. The current manual ticket system has many problems. One of the main problems is that passengers lose their purchased printed tickets. This prompts the passenger to buy another bus ticket. In this project, we propose QR readers for the bus ticket system. The QR code (Quick Response Code) is also becoming popular outside of the automotive industry due to its quick readability and greater storage capacity compared to plain barcodes. In this system, after registration profile and generating ID of a user, this will generate a QR code after we register a particular user which will have a user ID, we can add money to the wallet/ Add balance to a particular user ID. Whenever we go by bus, we have to scan the QR code. So directly money will debit from our wallet. QR code which supports bus integrated E-ticket and to improve the management (Transport corporation) process to generate reports quickly and significantly.

**IndexTerms - E-Ticket, QR Code, ESP32 Cam AI Thinker, SQL, Server**

## I. INTRODUCTION

In this bus ticket system for public transport using the QR code system we are actually trying to make the bus ticket system process in metropolitan as well as rural areas and public transport as an easy way by QR code system. As the ratio of private vehicles increases the traffic Congestion in the city increases with the same proportion. People don't prefer to use public transport. Private vehicles are chosen by people instead of public transport. Passengers might lose the printed tickets purchased from the counter. Passengers have to go to the ticket counter to purchase tickets and it is not very convenient as it is a time consuming process. Here QR code and camera can be used for the billing process which is easy to implement and cost effective also. This new system will support the eco green system that was prompted by the government with using less paper. It will improve the current system by using QR code where it is more efficient for the customer to keep the ticket. The current system of taking tickets for larger crowds leads to stop the bus for a long time. This increases the time delay for passengers and it hurts more for employees due to time delay in peak hours. So we have built one server that utilizes QR-Code which supports bus integrated e-ticket and to improve the management process in generating reports easily and systematically.

## II. LITERATURE SURVEY

In Existing system RFID Reader is used to read the RFID tag but destination should be entered by passenger in keyboard , So that amount will be debited automatically from the tag. Here if once destination is arrived, bus stops automatically and intimate with buzzer sound. Fairly such arrangement consumes more time in case of accessing of tag by every individual, so to overcome that, this ticketing system is developed. In proposed method, we are introducing QR reader. Here, we will create one application for select travelling route and generate amount. After generating amount, user has to read that QR image. Then automatically it will send amount from our bank wallet. Each conductor having one QR reader and after reading that values automatically it will store in database. [1]

QR Code is two-dimensional barcode which is categorized in matrix barcode that can store data information. QR stands for "Quick Response" as the creator intended the code to allow its contents to be decoded at high speed. It is introduced in Japan by Denso Corporation in 1994. [2]

By using this system, we are keeping record of the users and allocating unique ID for each user and giving them QR code for that particular ID. By doing so we only need to print the QR code once. Also, if the user has a smartphone, we don't even need to print anything at all we can just scan code from phones of users. [3]

By doing so we are reducing a lot of paper waste and also as we just need to scan the code to pay for ticket it is very easy and works as standalone system without any human involvement which can save time as well as money. [4]

The methods and framework we use now a days is a very dated system. What we use now is a machine to print tickets which is not the most efficient way and also do have a human involvement which can lead to human errors. The system has changed over years where in old days all tickets are pre-printed and whenever ticket fare used to get changed all tickets are simply discarded as they are of no use. After that now days we are directly printing tickets at time of distribution which avoids waste of paper in some ways but is still not efficient. Another way is to book ticket online over internet. This is another way to do the task but at particular this time not all people do have a smartphone and an internet connection. Still nearly 60 crore people in India do not have a stable internet connection. So, this cannot be used when considering widespread of public transport and time it takes to book ticket over internet. One another way is to use RFID technology which is used in some areas this also can simplify the process. But if we plan to roll this system out for crores of people this will require large production of RFID cards. Also, we need to take into consideration that such type of cards can be easily misplaced which will just increase additional steps to block card from system and generate a new one. Also, another factor we have to consider is that who is going to pay for prices of cards either administrator or user needs to pay for this. When talking about large number of users this cost is very high and as QR code is free license we can use it without any royalty.

### III. METHODOLOGY

In this paper, we present a system which will be automated and efficient where we are going to make use of SQL Server-based QR code ticketing methodology through which users just have provided unique ID and QR code as a ticket pass. In this user can add money to his/her wallet. After completion of this process, the user just has to scan that QR code and travel in a bus. The system uses hardware components to require the input from the validate it using the local server hosted in administrative side. This local server will store the details of the user.

### IV. HARDWARE DISCRPTION

#### 1. ESP32 CAM AI THINKER

ESP32 CAM AI THINKER is advanced version module which is created and developed by Espressif systems a shanghai based Chinese company. It is combination of very high speed Wi-Fi, Bluetooth, on board PCB antenna & precise camera also. This module is very small in size, low power consumption including two high performance CPU. And all of this things is entirely occupies in minimum PCB board. Here we are using this module because of this module is perfectly matches our conditions also it fulfils our all the needs. Another reason we are using this module is cost efficient, easily available in market, easy to handle and we are aware of this kit. We can use another modules like Arduino Uno, raspberry pi etc. as well but we are using this module which is perfectly matches above conditions. And when it comes to internet connectivity, it is quite durable and reliable. It has many applications like home automation, intelligent devices, QR Identification system, security systems and perfect for IOT applications.

#### 2. ULN2803 DRIVER

ULN2803 is a motor driver IC of 50V, 500mA Darlington transistor array. It consists of 8 NPN Darlington pairs that feature high voltage-outputs with common-cathode clamp diodes for switching inductive loads. All units feature a common emitter and open collector outputs. It is capable of high-voltage outputs (50V). The collector-current rating for each Darlington pair is 500mA. It is possible to parallel the Darlington pairs for higher current capability. Each Darlington pair has a series base resistor allowing operation directly with TTL or CMOS operating supply voltages of 5V or 3.3V. ULN2803 can be used in applications such as relay drivers, stepper and DC brushed motor drivers, lamp drivers, display drivers (LED and Gas Discharge), etc. Pin number from 1 to 8 is a Channel 1 through 8 Darlington base input while pin number from 11 to 18 is Channel 1 through 8 Darlington base output. Remaining of 9 and 10 pins are ground and common cathode node (VCC) respectively. It is important to note that common emitter is shared by all the channels. The purpose of using this driver IC is the output coming from ESP32 module is very low but we required more power or more voltage to run DC motor. We cannot give an output coming from ESP32, that's why to increase or to amplify the output of ESP32 module we required ULN 2803 Driver.

#### 3. LCD 16X2

A 16x2 LCD display is extremely basic module and commonly utilized in various devices and circuits. The operating voltage of this LCD is 4.7v-5.3v. 16x2 means it can display 16 characters per line and there are 2 such lines. Every character is built with a particular pixel box. It display can work on two modes like 4 bit & 8 bit. It works on a principle that it blocks the sunshine instead of dissipate. These displays are mainly preferred for multi-segment light emitting diodes and 7 segments. These are obtainable in Blue & Green Backlight. The most benefits of using this module are inexpensive, simply programmable, animations, and there are not any limitations for displaying custom characters, special and even animations etc.

#### 4. DC MOTOR

It is a device that converts electrical energy to mechanical energy. It works on the principle that a current carrying conductor placed in a magnetic field experiences a force that causes it to rotate with respect to its original position. DC Motor is capable of maintaining the same speed under variable load. It is used in robotics and factory automation, industrial equipment & medical equipment's. The main use of this motor in our project is to open and close the door. If exact condition matches with database then the signal give to this motor and then motor is driven and door is open otherwise not. DC Motor has permanently lubricated bearings. It is available with carbon steel or stainless steel shafts with single or double ended extensions.

#### 5. QR CODE

A QR code is a type of two dimensional barcode. A QR code consists of black squares arranged in a square grid on a white background, which can be read by an imaging device such as a camera. The main advantages of QR code over barcode are Barcode need to scan aiming specific angle of scanner line, while QR code can read from any angle. QR code has faster response than barcode. One of the biggest differences comes in terms of the differences between their designs or simply how they look. QR code contains information in vertical as well as horizontal format, while barcode contains only in vertical format. QR code has more data storage than barcode. If the QR code is damaged still it works, this feature is smartly used by companies. Because of the error correction feature, they can put a small logo or a picture within the code to make it more associable to the business in question. This in not in case with barcode. QR code can be scanned within micro seconds where bar code takes milliseconds to do so. QR Code is low threshold technology, low cost, easy to implement & easy to use. A QR code uses four standardized encoding modes (numeric, alphanumeric, byte/binary, and kanji) to efficiently store data, extensions may also be used. Data for a locator, identifier, or tracker that points to a website or application. In QR code we can store URL's, Email address, Contact data and text information.

#### 6. BATTERY (12V,1.1A)

This is a rechargeable 12volt 1.2AH Sealed Lead Acid Battery easy to handle, rugged and economical. It has a characteristic of high discharge rate, wide operating temperature, long service life and deep discharge recover & ideal for their uninterruptable power supply. Here we are using a battery to supply voltage to start our whole module.

## V. SYSTEM ARCHITECTURE

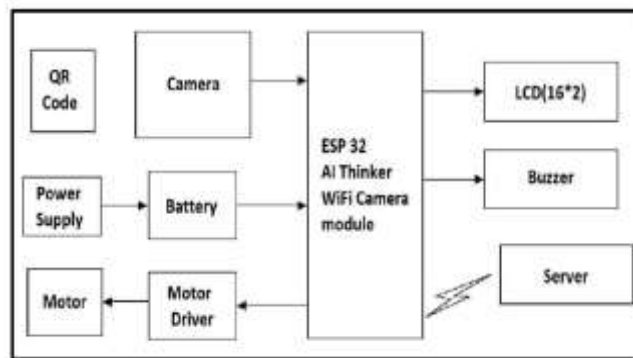


Fig 1 Architecture Block Diagram

In this project, we are proposing a QR code for a bus ticket. Users can scan QR code instead of buying a paper ticket. In this system, we are using SQL database. It is a simple language for relational database management systems. SQL statements are used to perform tasks like update data on a database or retrieve data from a database. Here we are using this platform for the same. As we know that the java is a very powerful language which also rich in libraries so that to login, to balance check & to generate QR code we are using this language. First, we are creating a local server. At this server side, we create special identity like username & password for admin. For passenger only admin can fill a form which contain data like username, user ID, mobile number etc. and after registration profile and generating ID of a user, this system will automatically generate a QR code. After we register a particular user which will have users ID and QR code. User can add money to the wallet/ Add balance to a particular user ID. Whenever user will go by bus, they have to scan the QR code. ESP32 module will capture the image of that QR code. We required an external power supply of 3v-5v to run our ESP32 module. This module can read that QR code and transmitted information to the server via Wi-Fi through inbuilt high gain antenna. At server side check the information received form module and do logic operations. If all the conditions exact matches and satisfying all the criteria then signal is transmitted to again ESP32 module. Debited or credited amount will display on LCD. As signal is coming through ESP32 module is very low so we required motor driver to open and close the doors of bus, thus here we introduced ULN2803 motor driver to amplify the signal. Thus, we get amplified output to run motor smoothly. If exact condition matches then motor will driver and directly money will debit from users wallet. The admin side (Transport Corporation) can keep track of traffic on the bus and can also track a particular user that on what day he/she is travelling etc.

## VI. ADVANTAGES

1. Minimize the use of paper as a conscious effort and little contribution towards Green IT and environment awareness.
2. Reduces pollution and road congestion – the more people who travel by bus, the fewer cars on the road.
3. Reduces paper waste by eliminating physical paper tickets and replacing it with QR codes.
4. Can work as a standalone system on mains or on its own battery backup which makes it very easy to be installed on moving vehicle itself.
5. Reduces human interaction so avoid any human errors and also help save money for administrator.
6. By using this project, we can eliminate cash issues like Change.

## VII. CONCLUSION

This paper presents a convenient and reliable system for public transportation. Since the RFID Cards are may be reusable but because of a large amount of production cost also may lead to plastic pollution. So QR Code as a ticket is the best option for passengers. The database for passengers were created and accessed via a local server through a Wi-Fi module. Thus, by implementing this project, the greater complexity of the problems faced by common people can be reduced. As it uses no usage of paper, even deforestation can be prevented and thus be saving our mother nature.

## VIII. FUTURE SCOPE

1. In this cashless method by using IR or Proximity sensors we can give us a count of the number of passengers present in bus, which could be used further to estimate the capacity of the bus.
2. In future we use GPS for tracking system. Unfortunately bus is crash, punctured or running out of fuel then we easily track the location of that bus and will provide security and suitable facility to passengers.
3. To avoid low battery interruption we can use solar panel on the roof of bus to charge battery. Another way to nullify this error is we can charge it through continuously rotating wheels of bus by using motors.
4. The program can be slightly modified to obtain safe travel of any transportation system such as Railways, school buses etc. More powerful algorithms can provide real time location information in internet, ensuring in time keeping of services. But since there are some shortcomings in these methods, it can be considered as a future scope which needs to be targeted by improved methodologies.

**IX. REFERENCE**

1. Mrs. D.Anuradha, M.V. Durga Devi, "SMART BUS TICKET SYSTEM USING QR CODE IN ANDROID APP" International Research Journal of Engineering and Technology (IRJET) Volume: 05 Issue: 03 | Mar-2018 e-ISSN: 2395-0056 pp 1936-1938
2. Phaisarn Sutheebanjard "QR-Code Generator" 2010 Eighth International Conference on ICT and Knowledge Engineering pp 89-91
3. C.UPENDRA REDDY , D.L.S.VARA PRASAD REDDY "BUS TICKET SYSTEM FOR PUBLIC TRANSPORT USING QR CODE" International Conference on Frontiers in Materials and Smart System Technologies doi:10.1088/1757-899X/590/1/012036 pp 1-5
4. A. Oudahl "RFID-BASED AUTOMATIC BUS TICKETING: FEATURES AND TRENDS IOP" Conference Series: Materials Science and Engineering IOP Conf. Ser.: Mater. Sci. Eng. 114 012146 pp 7-9
5. MYSQL : The World's most popular open source database Available: <https://www.mysql.com/>
6. Shiv. H. Sutar, RohanKoul, Rajani Suryavanshi, "INTEGRATION OF SMART PHONE AND IOT FOR DEVELOPMENT OF SMART PUBLIC TRANSPORTATION SYSTEM" 2016 International Conference on Internet of Things and Applications (IOTA) Maharashtra Institute of Technology, Pune, India 22 Jan - 24 Jan, 2016
7. Mrs. Shital Kolte, Korke Jayshree D. , Kandharkar Snehal B., Gaikwad Pranali A., Kale Geetanjali J. "SMART BUS TICKETING DESTINATION ANNOUNCEMENT SYSTEM USING QR-CODE" International Journal of Advance Research in Science and Engineering Volume No.07 Special Issue No.03, April 2018. [www.ijarse.com](http://www.ijarse.com)
8. Mr. Jayakumar. S (AP/[SI.G]), Raviteja.S, Yadhu Krishna.P.B, Sushovan Bhattacharya, Adipta Biswas "SMART BUS MANAGEMENT SYSTEM USING IOT" International Journal for Research in Applied Science & Engineering Technology (IJRASET) ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 6.887 Volume 6 Issue IV, April 2018- Available at [www.ijraset.com](http://www.ijraset.com)
9. ANTONY FERNANDAS.F, LOKESH.S, HARIKRISHNAN.N, KARTHIKRAJA.M. "SMART BUS FARE TICKETING SYSTEM USING RFID TECHNOLOGY AND GSM MODULE" National Conference on Emerging Technologies for Sustainable Engineering & Management (NCETSEM'18)-2018
10. Mr. D. Baskaran, Mr. M. Pattumuthu, Ms. B. Priyadharshini, Mr. P. Shabab Akram, Ms .S. Sripriya "RFID based Smart Bus using Embedded System" International Journal of Engineering Research & Technology (IJERT) ISSN: 2278-0181 Published by, www.ijert.org COCODANTR - 2016 Conference Proceedings

