

# Automatic Fare Collection in Metro System using QR Code

## (Cloud based System)

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**Abstract**—Over the past few decades, the number of passengers travelling through metro transport system has increased rapidly. Metro system, which is convenient, easy and fast has been a real life changer and time saving for individual's daily travel in congested urban areas. People either use smart card system or token system to travel in a metro. For those who are new to the city or those who don't have cards they have to wait in queues to get the metro tokens. This leads to time wastage and who knows what these tokens contains. It has been used by several passengers. Another is that the passenger may face cash problems since token master has to collect fare in order to give token. Like these, there are many problems faced in the current system. To overcome all these we came up with a new system using QR code as the main method of transport and payment. In our system we will use QR code which will be generated in your mobile phone to pass through the metro gates which has the scanning device inside. This not only solves the problem of wasting time but is also more convenient.

**Keywords**—Metro transport system; QR code; AWS S3; Django;

### I. INTRODUCTION

Multimodal transit networks provide convenient and efficient ways for individual's daily travel in congested urban areas. Metro system as a major component of multimodal transit system, is being used by several people across the country. People new to the city and those who are still using token system are facing different kind of problem during their travel. Though it is supposed to be a time saving and efficient transport method, still people waste their time in queues, face cash problems and many more. To overcome all these we came up with a new system solves all these problem with one quick scan. That is the QR code system.

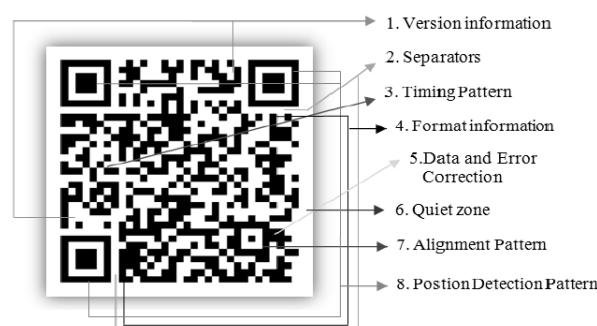
In our system we generate the QR code in your mobile phone taking your mobile number and username as an input to create a unique code for everyone and then you just have to scan it at the gate. Problem solved. No more waiting in the queue, no more cash problem and most important living in this pandemic situation, no more contacts with other people at all. People now don't have to

touch the used tokens and swap your card on the gate of the stations.

Our project aims to take the current metro transport system to the next level where all can be done with a simple scan and there is minimum human contact.

### II. RESEARCH BACKGROUND

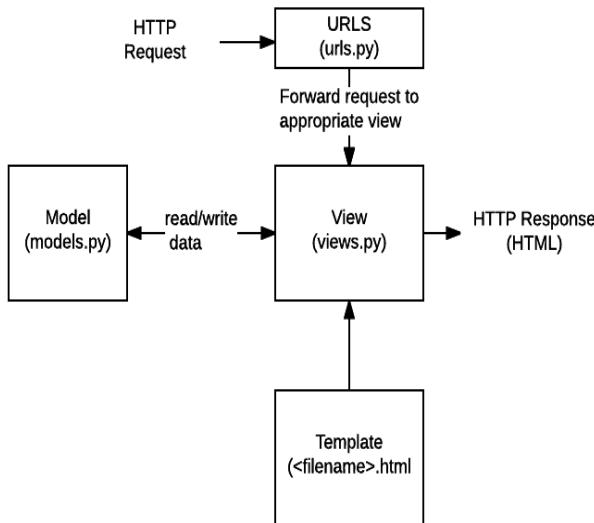
QR code (abbreviated from Quick Response Code) is one type of barcode (or two-dimensional barcode) first designed for the automotive industry in Japan. The technology for QR codes was developed by Densa-Wave, a Toyota subsidiary. A barcode is a machine-readable label it contains information about the item to which it is attached. The code consists of black modules arranged in a square pattern on a white background. A QR code uses four standardized encoding modes (numeric, alphanumeric, byte/binary, and kanji) to efficiently store data; extensions may also be used.



Another technology which we are using is AWS s3. Amazon s3 or amazon simple storage service is a service offered by the amazon web services (AWS) that provides object storage through a web service interface. It uses the same scalable storage infrastructure that Amazon.com uses to run its global e-commerce network. Amazon s3 can be employed to store any type of object which allows for uses like storage for internet applications .backup and recovery, disaster recovery, data archives, data lakes for analytics, and hybrid cloud storage.

For the server, we are using Django. The reason we choose to go with Django is huge amount of benefits which comes along it. (Fast, scalable, versatile, secure, documentation)

*Django design pattern*



PayPal, one of the world's leading online financial service that allows you to pay for items using a secure internet account is what we are using for our system's payment gateway. Another reason to use PayPal is that it offers an additional layer of security to payments. As you do not have to enter your card details or CCV number each time you purchase something, just your PayPal login and password or mobile number and PIN, the online store does not have your details in its database.

### III. LITERATURE SURVEY

Public Transport system (PTS) remains the major source of income in most of the developing countries like India. However, PTS now faces severe malfunctions and various security problems. First, there is a lot of confusion between the passengers regarding fares which lead to quarrels and chaos. Metro being one of the major transport system is expected to be fully automated, reliable, transparent and convenient.

QR code is becoming more popular these days as many prefer online payments over cash. With the increasing number of online payment users, it's high time for the country to change its fare collecting system.

People in some states have seen advantage in the QR based transportation and are ready to go with it. Hyderabad Metro Rail Ltd in partnership with Paytm has launched a QR-code-based metro ticketing system at Rasoolpura metro station Hyderabad, Telangana. The new service will enable commuters to travel seamlessly and avoid queues to buy tokens at the metro stations. They can now simply purchase a QR ticket on their Paytm app, which can be displayed at

the Automatic Fare Collection (AFC) gates to proceed for the journey.

In 16th September 2018, The Delhi Metro has introduced QR code based ticketing facility for travel on Airport Express Line. With the introduction of this facility, commuter's using Delhi Metro's Airport Express Line will be able to use the QR Code generated on their smart phones instead of smart cards or tokens to travel. This system of QR code based ticketing through smart phones will enable passengers to purchase tickets using 'Ridlr App' without physically coming to the Metro station.

For the mentioned two systems, both of them are using qr code as a one way travel ticket. What makes us different from them is that we don't have to purchase a QR code ticket every time we travel. Our system will give the user a QR code that is his only and unique from everybody else. The user can put amount in their generated account using PayPal, so that you don't have to purchase a ticket every time.

### IV. CONCLUSION

The work of automatic fare collection using the QR code system is a cloud based project work which aims to transform the current metro transport system to the next level. We are having fixed in our minds certain which we have enumerated before in this report. So we find it important to take stock of the whole work that we have done till now. The understanding of the proper functioning of the automatic fare collection using the QR code is totally based upon thorough understanding of the python language and working of the cloud based AWS service.

To conclude it in a few words, we have created a system where we took the metro transport system to the next level with just a quick scan. Easy, efficient and time saving.

### ACKNOWLEDGMENT

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