Automated Railway Reserved Ticket Validation System

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Abstract
Booking, traveling, catering, and other amenities are all provided through a railway system. We aim to fix several problems with Reservation coupes in our proposed system. The traveler wishes to validate the ticket with TTE since the invention of the Railway management system, so we sought to do it with an automation system that could verify both digital and physical tickets without the help of TTE. In the proposed System QR code for each ticket, we employ sensors to scan the QR. We look up the PNR number and compare it to the database's entries. While the passenger details are stored in the database when the passenger is booking the ticket, The ticket booking system is upon the Indian Railways by entering the basic details of the passenger and book the ticket Online or the passenger can buy the Counter ticket in the Online Mode, Only the system Concentrates the database which is used for validation. If the ticket is legitimate, the system displays the Seat Number and shows it is Validated; otherwise, it displays a "non-valid" message to the passenger. If a coach mismatch occurs, the message "Ticket is valid Please Go to Correct Coach" is displayed. Only the journey from source to destination is covered by the verification.
Keywords: Train Ticket Validation, Automatic validation system, Reserved Tickets Validation, QR code generation.

I.   INTRODUCTION

The Indian Railways Ticket System makes it simple to order tickets either offline or online, with a variety of payment options. The majority of people find Indian railways to be the most acceptable mode of transportation. However, some steps should be taken to reduce physical labor. We need to improve the existing train ticket validation verification system, taking into account the advancement of technology in every department. However, the validation system is only available offline. He validates the ticket with the Chart, which is created before 3 hours of train departure time, with the help of TTE (Train Ticket Examiner). This means it is a lot of paperwork and wants to check manually, which is time-consuming. while eliminating the paperwork, the advantage is making the system environmentally friendly. The Train Ticket Validation System checks tickets against a database. By the way, the passenger details are already posted into the database when the ticket is confirmed. Because persons with unreserved tickets have tickets but it is not updated in the database. while regulating that all passengers should scan their tickets, the persons who have the unreserved tickets can be found with the automation process and the authorities can charge them, it ensures the safety of reserved ticket passengers. Our proposed System's major purpose is to ensure that the correct ticket is validated, as persons with unreserved seats have tickets but are not permitted to enter the reservation coupes. Passengers want to check their tickets with the system so that the count can be increased. If anything, records of the passengers wanted by Authorities can easily be taken into the database. This system also keeps track of whether or not passengers' tickets have been verified. In addition, the system should ensure that the Ticket is valid at both the Source and Destination. The database is dynamically updated because the passenger's list with every station changes.

II. LITERATURE SURVEY

Maria Grazia Gnoni entitled "A smart model for urban ticketing based on RFID applications" was Published in 2010 in Industrial Engineering and Engineering Management, 2009. This paper highlights that the Mobility of persons and goods currently represents an interesting field of application for innovative ICT tools such as Radio Frequency Technology (RFID). RFID technology is increasingly spreading in logistics activities, such as warehouse management, and supply chain traceability. RFID could support an automatic vehicle and person identification system by reducing investment costs. In the present paper, the authors propose an

Integrated Mobility System (IMS) that aims to improve the performance of ticketing management in a public transport network based on an intensive application of RFID technology.

Kalbhor, Ashwini Mangulkar, Snehal Kulkarni entitled "An Android App for Local Railway Ticketing with GPS Validation." International magazine of emerging trends in science and technology, published 9 April 2014. This paper explains that. One of the most difficult issues in the present ticketing system is the "QUEUE" while purchasing suburban railway tickets. In this fast-changing technological age, we still line for our suburban tickets or pay with oyster and octopus cards, which can be irritating at times if we are late or forget our cards. Android Suburban Railway (ASR) ticketing is mostly used to purchase suburban tickets, which are the most difficult to obtain when compared to booking long-distance tickets using 'M-ticket,' which fails with suburban (local travel) tickets. User's ticket information is stored in a CLOUD database for security purposes which is missing in the present suburban system. A User's ticket information is stored in a cloud database for security purposes which is missing in the present suburban system. Also, the ticket checker is provided with a checker application to search for the user's ticket with the ticket number in the cloud database for checking purposes. Keywords: ASR ticketing, GPS Validation, Cloud Database, QR- Code format of a ticket.

V.Vanitha, V.P.Sumathi, R.Kalaiselvi entitled "Automatic Ticket Validation System for Indian Railways " published in 2018 in the International Journal of Recent Technology and Engineering (IJRTE) proposed the idea of the Railway system places a vital role in public transportation. Railways are widely used commutation by the public. There are many services provided by it like a ticket, catering, etc. The ticketing system has evolved from a paper ticketing system to an electronic ticketing system. In a metro train, the system provides a smart card where a passenger can recharge and buy tickets using that, this may be a regular or seasonal ticket smart card that will calculate the fare for travel. To book tickets for long-distance travel, passengers can buy e-tickets via the internet or can in person at railway stations. In the case of an e-ticket, the tickets would be validated by the ticket examiner (TTE) with valid original identity proof. Passengers will be in trouble if they forget to take their ID cards. Lack of Ticket Examiner leads to minimal verification of the passenger's ticket. In the proposed system by the use of online services with the internet, passengers can add their own unique national identity proof (Aadhaar card) while booking tickets, which helps automatic ticket validation. Biometric checks of the passenger take place at the entrance and exit of each compartment of the train. With the help of cloud storage, the details can be validated by comparing the Aadhaar database. In case of mismatching tickets, alarm rings and an alert message will be sent to Ticket Examiner. Using GPS on a train, location can be obtained and the source and destination of the passenger can be validated. Checking at the exit path, the destination can be checked and can avoid the persons traveling long distances with short distance traveling tickets. Also, the system prevents the person from traveling without buying tickets. The proposed system is implemented using Raspberry Pi, a fingerprint scanner, and GPS Receiver.

III. EXISTING METHOD

India has some of the most comprehensive train prices in the world, and higher-class fares are significantly subsidized passenger flow. In our current situation, The passenger must use the train ticketing system. obtain a ticket manually, which is then checked by the TTE and the passenger is on his or her way. Tickets are also available from your cell phones or the internet, subject to certain terms and conditions applied. In the Current Situation, The passengers want to check the tickets with the TTE (train ticket examiner) with both physical and Digital tickets, While Today it is the offline mode with the help of TTE with manual checking. Some trains in Delhi have the system of android Application and also want to check manually with the help of TTE. If The Ticket is Valid then the sheet is marked and the passenger is allowed to journey on the train. The ticket contains all of the relevant information about the passenger, including his name, age, UID, and any concessions (if any). Different Train tickets vary in price. The train prices are determined by the categorization of trains (super-fast, passenger) The passenger is on his way to Booking. The Tickets which are given at the counter are Physical Tickets and the booking form online with necessary details will be Digital Tickets. The digital Ticket contains the QR code for Quick getting Information

Both the Physical and Digital Tickets are verified by TTE by Manual Mode only. Some Premium Trains Have TTEs, they want to put a checkbox tick in their Smart Tablet which is stored, But also it is manually verified.
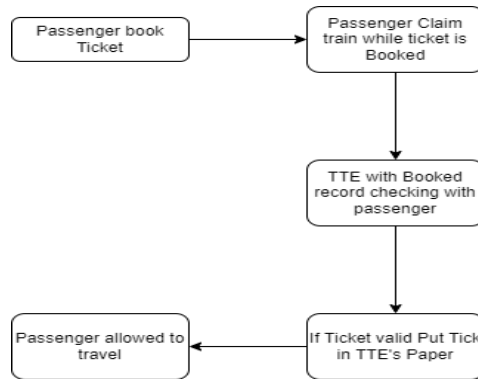
Fig 3.1 Flow Diagram of Existing Method

IV. PROPOSED SYSTEM

The Proposed System, The system Uses the technology of Computer Vision and Image Processing. The whole system is built on the Python Framework Streamlit. Streamlit is a great new tool that allows engineers to quickly create highly dynamic online applications based on their data, machine learning models, or anything else. If that makes sense, think of Streamlit as a cross between a Jupyter Notebook and an Anaconda and Pandas. It includes a whole Python-compatible software ecosystem. The website documentation is well-organized and includes step-by-step instructions for setting up and deploying the app, as well as seamless integration with the Python environment.

4.1 QR Code:

The system is built with Python. The first Section is QR Code Generation, A popular style of two-dimensional barcode is the Quick Response Code. It represents alphanumeric data. To decode this, you can use a handheld scanner or a camera in a laptop or mobile phone to scan the code and use an algorithm to decode the data. The passengers Can Book the ticket with the application of whatever they can choose but while the ticket Generation The QR code wants to generate and wants to be built with the ticket which is placed on both Physical and Digital Tickets. In the QR Code, The PNR number (Passenger Number Record) is pinned with the QR code.
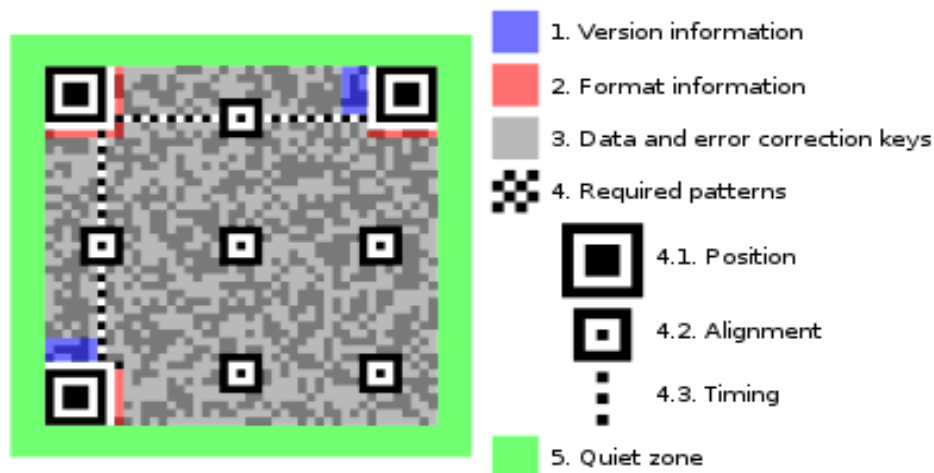

Fig 4.1 QR details

4.2 Opencv:

Using the help of OpenCV, the scanner scans QR codes with the HD camera. OpenCV is a Python open-source library for computer vision that may be used in applications like AI, machine learning, and face recognition. OpenCV stands for computer vision, and it can distinguish items, faces, and even human handwriting in photographs and videos. When combined with other libraries, such as Numpy, a highly efficient library for numerical operations, the number of weapons in your arsenal grows, as any operation that Numpy can do can be merged with OpenCV. OpenCV is defined as a branch of research that helps computers understand the content of digital pictures like photographs and videos. The purpose of computer vision is to understand the content of an image. Extract information from photos. This includes objects, language

descriptions, or 3D models. A record of the passenger number is taken and checked against the database to determine if the ticket is valid and a validity status is returned.

4.3 Database:

The information about the passengers is saved in a database. For the Database, SQL is a popular one for handling data for ticket verification. SQL is an abbreviation for Structured Query Language. SQL is a programming language used to interface with databases. According to ANSI, it is the standard language for relational database management systems. SQL statements are used to both updates and retrieve data from databases. Oracle, Sybase, Microsoft SQL Server, Access, Ingres, and other SQL-based relational database management systems are some examples. Although most database systems use SQL, they frequently have their proprietary extensions that are only used on their platform. SQL commands like "Select," "Insert," "Update," "Delete," "Create," and "Drop" can perform almost anything with a database. SQLite is the easiest to use for data handling in Python. SQLite is a software library that implements a relational database management system. The lite in SQLite indicates "lightweight" in terms of setup, database management systems, and required resources. SQLite's key features include self-contained, serverless, zero-configuration, and transactional. SQLite is a C library that provides a disk-based database that does not require a separate server process and can be queried using a unique SQL query language. SQLite can be used to store internal data in some applications.

The validation system returns to the webpage area that will show the validation status, Hence the passenger can have their seat. if the passenger fails to show a correct or valid ticket. It gives a Warning to the passenger via the Screen.
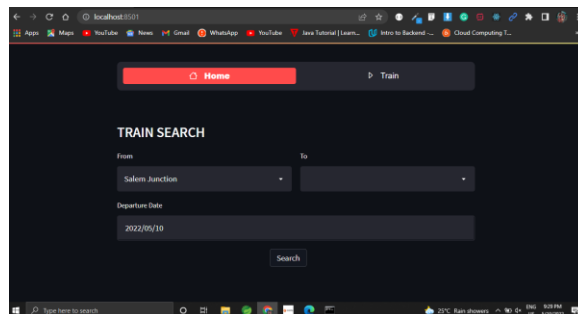
V.   KEY RESULTS

5.1 Ticket Booking

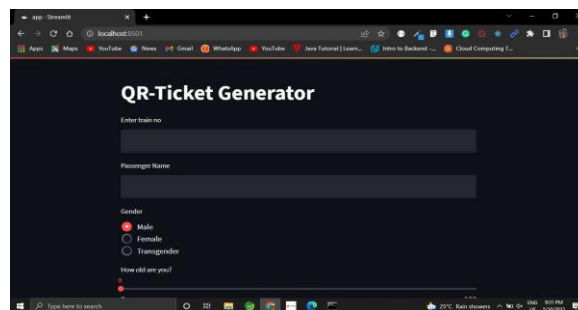**Fig 5.1 Ticket Booking**

5.2 QR-Ticket Generation

Fig 5.2 QR-Ticket Generation

5.3 QR-Scanning

QR will be scanned through the HD Camera, Opencv help for this to scan the Qr and take out the PNR Number for validating the Ticket through the Database
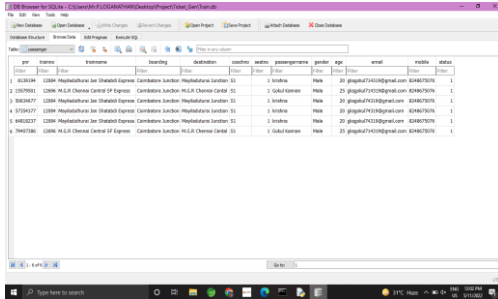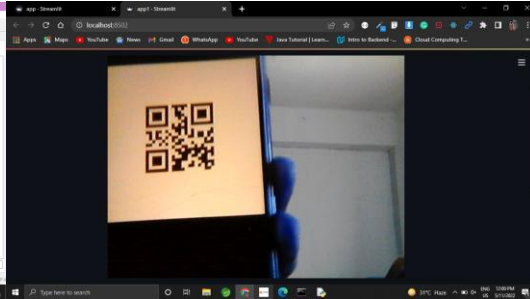
Fig 5.3 Database Sqlite 3   **Fig 5.4 QR Scanning**

5.4 Ticket Verification

The Ticket will be verified once the ticket is checked with the database and it returns the validation status the Train details are shown in the below Image.
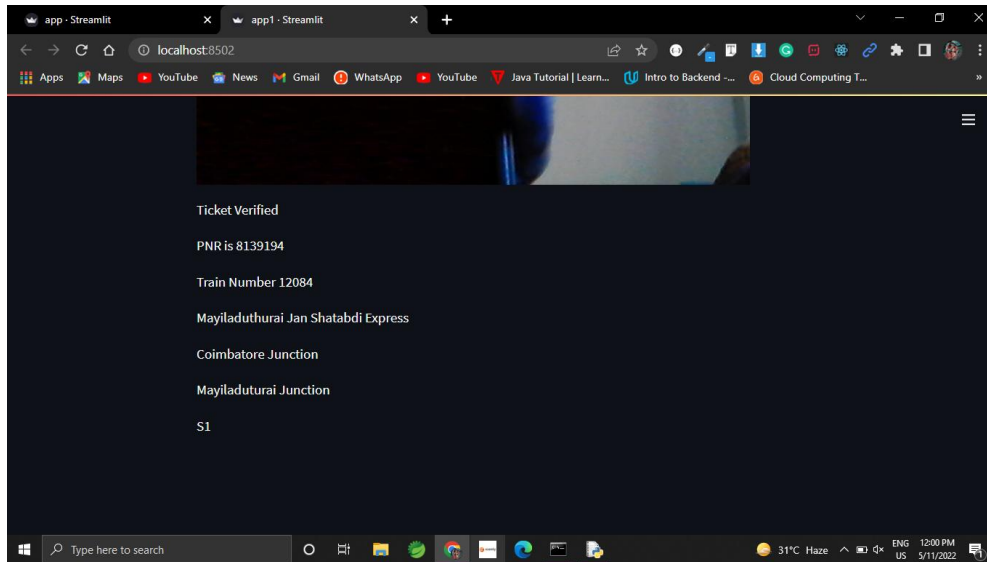

Fig 5.5 Ticket Verification

VI. FUTURE ENHANCEMENTS

The main motivation is to validate tickets without the assistance of TTE, but the system must stop the persons with the ease of monitoring without the assistance of RPF Authorities by erecting a gated wall into the train. While more people travel from the train without valid reserved tickets in Reservation Coupes, and the system wants to install while entering the Door of the Train, thus it is easier to validate tickets, also the system may develop to identify the correct persons with the Face Recognition or Fingerprint Scanner, etc. The system recognizes the person who crossed the destination using location identification services and tells the ticket checker. This method eliminates manual labor and prevents fraud

VII. CONCLUSION

The ticket validation System is automated while the passengers only want to show their ticket in front of the camera. The QR will be scanned and it returns the validation Status. Hence it is useful for the Railway system and the system effectively works for the Reserved passengers while the details of the passengers have been cross-checked and it reduces the work of TTE(Train Ticket Examiner) and it regulates the passenger to scan, Hence it reflects the Unreserved passengers who boarding a train without Reservation Booking that will be helpful for reserved ticket Passengers also Monitoring is high in this system Because the System can run without the help of TTE.So Manual Monitoring is needed so The passengers can travel safely and also can find out the unreserved passengers with the count taken from the system.

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