

Passenger Authentication and Ticket Verification at Airport using QR Code Scanner

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Abstract- Verification of the identity of each passenger at an airport is paramount to the security of the airport infrastructure as well as for the passengers. This research paper intends to automate the passenger verification process and make it a contact less and time saving experience for passengers by developing an application that scans the QR code on the e-ticket of the passenger, issued by the airline and allows the passenger to verify himself to the airport security agencies. We have developed a GUI application that will have access to a webcam using which the QR code will be scanned on the e-ticket. The application will then fetch data of the user from the airport authority's database. The passenger will then have an option to verify himself, edit the data if required. Once the user verifies himself, the information is shared with the security agencies and the user is granted the access. In this study, we had tried to reduce the load on airport security check-in system that make the process contactless and reduce the turnaround time of flights.

Keywords- Passenger Verification, Authentication, QR-code Scanner

1. INTRODUCTION

The security of airport across the country has been a major concern for the government as well as the security agencies, taking into account the various incidents that have happened in India and abroad involving terrorist attacks, aircraft hijackings and bombings etc [1]. These gruesome incidents have led to the death of countless innocent civilians who became the victims of terrorism and have been regularly blamed at the airport security lapses on the hands of the security personnel involved. People with negative intensions posing as passengers enter the airports [2].

using forged airline tickets and fake identity proof documents such as fake passports, aadhar cards, pan cards etc. These documents are checked manually by the security personnel present at the entry gates to the terminal buildings [3]. It is difficult to determine whether an identity proof document and an airline ticket are genuine or fake just by looking at it. Also because of the high number of people passing through airports daily, it becomes infeasible to check

each and every person's documents manually at the entry gate [4]. Taking advantage of these loopholes in the airport security system, some anti-social elements may enter the airport terminal building with prohibited materials and can cause havoc by launching terrorist attacks or by hijacking entire aircrafts, thus putting the life of passengers in danger. Also, the current system of validating the documents with help of security personnel involves close contact between the personnel and the passengers, thus posing a health and safety risk to all if in case a passenger is found to be accidentally carrying a deadly virus which the passenger may transmit by coming in close contact with other human beings [5]-[9].

2. LITERATURE SURVEY

With air travel becoming more and more affordable, a high number of individuals travel through airports daily [10]. Given the higher number of passengers passing through airports, it leads to a situation of rush hour at the airports at a time when many flights are scheduled one after the other. This makes these passengers highly susceptible to potential terrorist attacks which intend to cause heavy damage due to the crowd of passengers assembled all at once [11]-[12]. Likewise, to the way the enormous volume of passengers on well-known airlines will raise the likelihood of hijacking a plane as well as the obviously high death rate from plane attacks. The entire aviation sector may be in danger if it were used as a weapon to cause a large number of casualties, making aircrafts an ideal target for terrorists [13]. One of the examples of such an incident happening is the infamous 9/11 terrorist attacks in the USA where an aircraft was four aircrafts were hijacked by terrorists, of which two were crashed into the twin towers, one in pentagon and the other in a field killing almost 3000 people [14]-[16]. In the year 2018, at Lohegaon International Airport in Pune, security of the airport was breached when a foreign national entered the airport with a fake ticket and forged identity proof documents. Our system is set

up to prevent problems like the use of bogus tickets or passenger identities, as well as the entry of fictitious passengers and their illegal movement across airports, which pose a serious threat to the aviation sector. In existing system, the security personnel deputed at the airport terminal entry gates check the printouts of the e tickets carried by the passenger and then verify the passenger's identity using the unique identification document produced by the passenger [17]. This unique identification document possessed by the passenger may include any government IDs such as aadhar cards, passports, PAN cards, voter ID cards which are used as proof of identity across the country. The main concern of the security personnel is the e ticket with the passenger being genuine but not much attention is paid to thorough verification of the identity of a passenger [18]. This ticket and identity verification process is carried out manually without the use of any modern digital devices at all airports across the country and is prone to human error.

3. PROPOSED SYSTEM

The technology we're recommending in the proposed system entails implementing an encrypted QR code for the authentication of airline tickets using the ticket IDs at the airport entry gate, which are to be cross verified with a database containing all the ticket IDs that have been granted airport access for a specific day. Passengers will register their information for this initiative using a centralized registration system. The AAI website will have this registration form available. With the use of his UID information, the passenger's identity will be verified. Each passenger will receive a special ticket ID encrypted in QR code printed on the electronic ticket after their identification has been verified and their airline ticket has been purchased. When this QR code is scanned, the ticket ID will be requested and checked against a database of ticket IDs in which access has been given. This will verify whether or not the ticket is genuine. This verification would take place as you entered the airport using several kiosks at the entry gate. Following a successful check, the passenger will be permitted to enter the airport.

The methodology is implementing the QR codes on the tickets generated by the airline company. A passenger will first book a ticket with an airline to travel to a destination. The airline will ask for a unique identification number such as the aadhar or passport number of the individual to verify his/her identity through government databases. Once the passenger books a ticket, he/she can download it and take a printout of that e ticket. The softcopy of the ticket will come with a QR code printed on the ticket which will contain the encrypted ticket ID. To catch the flight, the passenger may proceed to the airport on

the designated date of travel declared while booking the ticket.

```
while True:
    success_img = cap.read()
    for barcode in decode(img):
        myData = barcode.data.decode('utf-8')
        print(myData)

        if myData in mydataList:
            print('Access Granted')
            myColor = (0, 255, 0)
        else:
            print('Access Denied')
            myColor = (0, 0, 255)

        pts = np.array([barcode.polygon], np.int32)
        pts = pts.reshape(-1, 1, 2)
        cv2.polylines(img, [pts], True, (255, 0, 255), 5)
        pts2 = barcode.rect
        cv2.putText(img, myData, (pts2[0], pts2[1]), cv2.FONT_HERSHEY_SIMPLEX, 0.9, (255, 0, 255), 2)

    cv2.imshow('Scan your QR Code here', img)
    cv2.waitKey(1)
```

Figure 1: QR Code working

At the airport, the passenger will proceed to the ticket verification kiosks placed outside the terminal building which contain the application that will verify and validate their ticket as genuine or not. At the kiosk, the passenger will log-in into the application using his/her registered email ID and password. If the data fed by the passenger in the required fields matches with the details provided by the passenger while registering with airport's central passenger database, the application will proceed to the next page where the web camera mounted on the kiosk will be activated. Once the web camera is activated, the passenger is required to display the QR code printed on the e ticket in front of the camera. If the ticket ID encrypted in that QR code matches with valid ticket IDs contained in the kiosk's database for that particular date, a message stating "Access Granted" will be displayed in green colour and the passenger will be allowed entry into the terminal building. If not, then a message stating "Access Denied" will be displayed in red colour and the passenger's entry into the terminal building will be restricted then and there only. The registration of e-mail IDs and passwords for logging in into the application on kiosks will be a one-time event for any passenger that will be required before visiting the airport for the first time. This registration will be done using a form available at Airport's Authority of India website and the data generated using that form will be stored in the central passenger database maintained by the AAI and shared with all airports across India

4. BLOCK DIAGRAM

The majority of Indian airports now use a manual approach for passenger authentication. The existing procedure takes a long time and also prone to fake passengers entering the airport which may lead to

various security concerns and threats for the agencies managing the airport security as well as for other passengers commuting via the airport. By implementing the project, the process of ticket authentication and identity verification will become a less time-consuming experience for the passenger which in turn would help in reducing the turn-around time of flights arriving at the airport to a great extent. The project will also help in reducing the load on the security personnel at the airport thus allowing for better management of the human resource involved in securing the airport. Finally, the project will help in making this process contactless which will greatly reduce the risk of spread of deadly viruses and contagions which may be transmitted otherwise by international passengers travelling through the airport

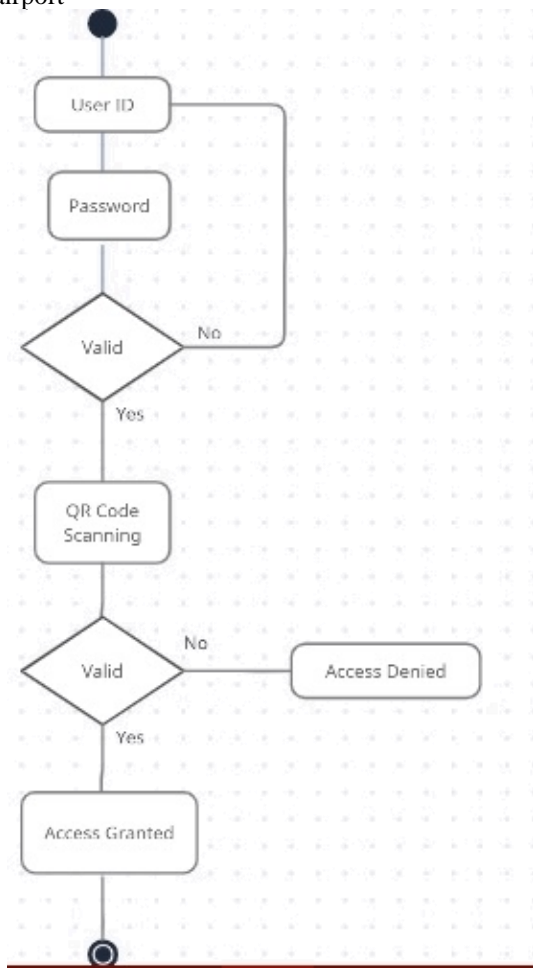


Figure 2: Flow chart

5. RESULTS

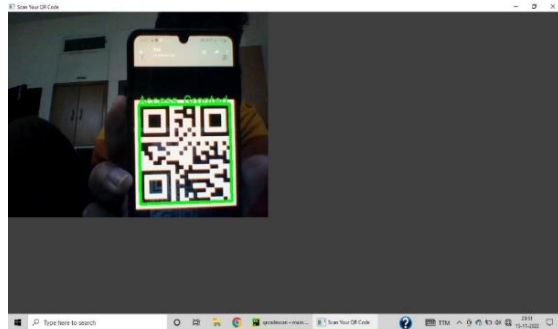


Figure 3: Access Granted

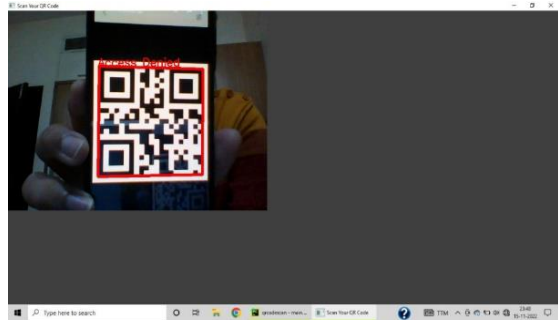


Figure 4: Access Denied

6. CONCLUSION

We may raise the bar for our airport security system by using QR codes for authentication and verification. Using this Security System, verification and authentication of passengers will become a highly reliable process. Using QR code technologies for security purposes has proved to be highly accurate and trustworthy. By putting this strategy into place, we can overcome many offences like forgery of identity verification documents, generation of fake e tickets to crimes such as thefts, terrorism and hijackings etc. This approach will make travel easier and eliminate the need for several identity checks. This would also aid the aviation sector in eradicating problems like terrorist threats to both passenger and aircraft security. This initiative will, overall, facilitate a smooth flow of travelers through the airport entry gates. It will facilitate a verification process with less human intervention and error that too in a time efficient way and will aid in smooth functioning of an airport. Finally, it shall prove to be of great help to the country by keeping in check the various security threats and malpractices that may affect an airport’s infrastructural security.

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