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# Demo Abstract: Contactless E-ticketing in Public Transport Buses

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***Abstract*—Open Transit Data (OTD) availability presents an excellent opportunity for commuter-centric applications. Applications that use OTD to inform users about their commute. Moreover, the current scenario demands applications that make travel in public transit safer and more comfortable. To this cause, we present a contactless e-ticketing solution for public transport buses allowing passengers to purchase tickets in a contactless manner. It is currently in a trial phase since September and has sold over 200k tickets. The system also presents opportunities for third-party vendors to develop similar solutions.**

***Index Terms*—contactless, e-ticketing, open transit data**

## I. Introduction

The open transit data (OTD) platform, set up in the late 2018, provides real-time location of public transport buses in Delhi. The aim was to bridge the information gap between public transport and its commuters. Moreover, with the current pandemic scenario, the need to digitize public transport with measures to make it safer for passengers has become imperative.

To this end, we have proposed and implemented a QR-based e-ticketing solution for public transport buses based on Open Transit Data (OTD) in Delhi. The solution allows a passenger to buy a ticket without needing to interact with the conductor. It is currently in a trial phase, operational on 100+ routes with over 650 buses across Delhi through the Chartr app (available on Google Play Store). Note that this is probably the only project of this kind running in India.

## II. Methodology

In Delhi, majority of passengers who travel daily in public transport own a smartphone, and people are used to QR code-based payments. In our QR code-based ticketing solution, every bus has a unique QR code that a user scans to buy a ticket. Additionally, the code helps determine the bus's agency and the route on which the bus is running (from OTD). Fig. 1 shows the basic ticketing flow encountered by a passenger.

### A. Ticketing Flows

There are two ways in which a passenger can buy a ticket,

- When passenger knows the exact fare
  - Scans the QR present on the bus.
  - Select the fare (5, 10, 15, 20, or 25) depending on the bus type.
  - Select number of tickets (in case of multiple tickets)
  - Pay for the ticket and get a ticket.
- When a passenger does not know the exact fare
  - Scans the QR present on the bus.
  - Select the route, source, and destination stop
  - Select number of tickets (in case of multiple tickets)
  - Pay for the ticket and get a ticket.

Our aim for introducing these two flows of buying tickets was to imitate existing ways of buying tickets from conductors but improved.

## III. Use-Case

Fig. 2. Ticket QR pasted on the back of a seat.

The foremost objective of the framework is to minimize contact in the process of purchasing tickets. Passengers can board a bus, move on to their respective seats and then buy a ticket using the mobile app, allowing them to start their journey in a contactless manner, imperative in the current scenario. It also streamlines the process of journey initiation,

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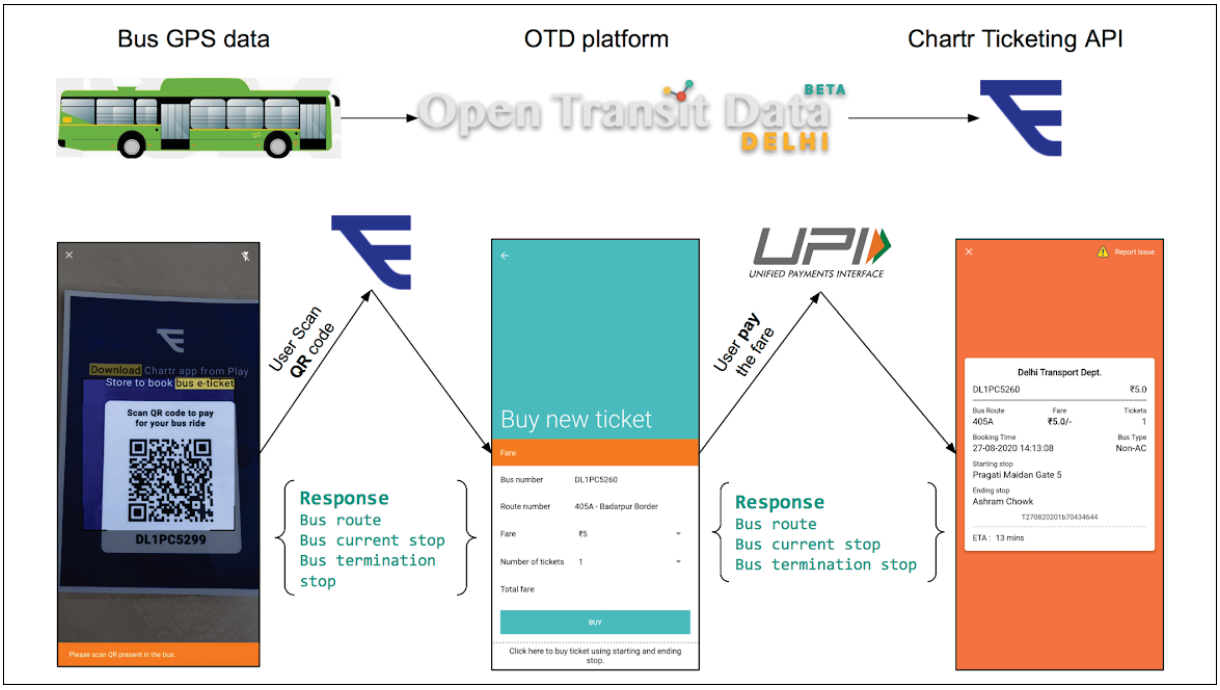


Fig. 1. Contactless e-ticketing framework

eliminating the need to wait in queues for getting tickets from the conductor. The proposed solution is both safe and comfortable for passengers to adapt since it mimics the real-world experience. Fig. 2 shows a QR code at the back of a seat which a passenger can scan using the Chartr mobile app to buy tickets.

### A. Usage Statistics

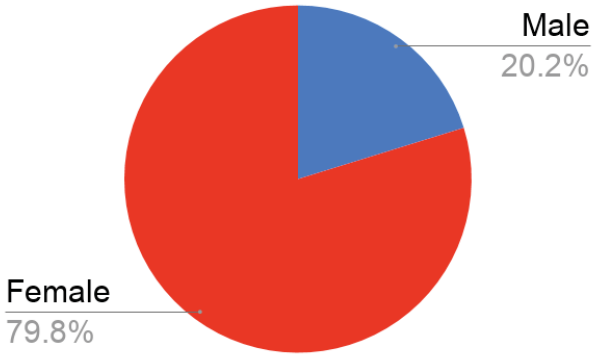


Fig. 3. Gender-wise ticket tally

*1) Ticket Demographics:* Fig. 3 shows a comparison between the number of tickets bought by male passengers versus female passengers. The massive difference in ticket count is because of the ease in buying a ticket for females (pink passes - free) in comparison to a general ticket, where the commuter has to pay and wait for the payment gateway to process payment for the ticket.

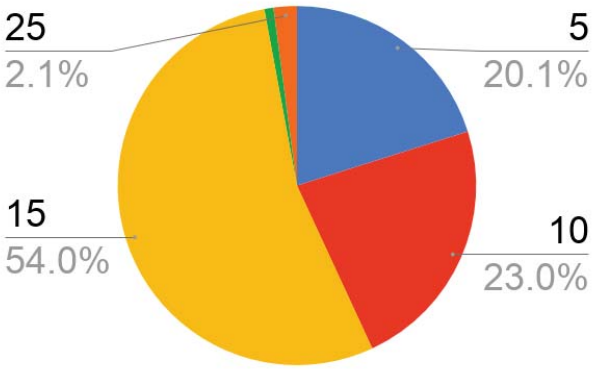


Fig. 4. Denomination wise ticket sale comparison.

*2) Denomination Usage:* Fig. 4 shows a comparison in ticket sales for different denomination values. There is a significant difference in the number of tickets purchased for each denomination. A Rs. 15 ticket in a non-AC bus lets the passenger travel the entire length of the route. This means that passengers traveling longer routes are more likely to prefer the contactless way of buying tickets. Another way of looking at the situation is that a long-distance commuter might be more interested in the changes happening to their commute since a big part of their day is spent traveling on buses compared to a short-distance commuter.

*3) Returning Users:* 70% of users bought a ticket on two days or more days via the mobile app. This hints us that such a solution is needed.

## IV. Conclusion and Future Scope

In present times, it is imperative to rethink and redesign our traditional infrastructures to make them adapt to the current scenario. Contactless e-ticketing is a major step in this direction, changing the age-old process of physically buying bus tickets. We have presented an e-ticketing solution based on open transit data. The system is currently in the trial phase in Delhi on 150+ routes and has already sold over 230k tickets in three months. According to initial usage statistics, we can see that people are adapting to the framework positively, especially women. The next steps would be to expand the framework to cover all 6k+ buses and create an open ticketing platform, enabling other players to perform e-ticketing on their applications.

## V. References

1) Open Transit Data Platform, Delhi (https://otd.delhi.gov.in/)