Extending Indian Railway's UTS app access to private travel tech platforms

Contents

This paper addresses the critical need to extend access to the Indian Railway's Unreserved Ticketing System (UTS) app to leading travel tech companies. Inter alia, it also highlights the positive impact of the IRCTC's decision to extend the reserved ticketing system booking to such companies and emphasises the potential benefits in terms of customer ease, revenue contribution, and platform optimisation.

Introduction

The Indian railways, often called the 'lifeline of India,' is more than just a transportation network. It is a symbol of national unity, progress, and cultural connection. With a vast network spanning over 68,000 route kilometers (42,280 miles) and over 7,000 stations, it is the fourth largest railway system in the world and the largest employer in India, employing over 1.3 million people. Some noteworthy highlights are:
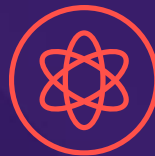
Passengers

8.08 billion passengers carried in 2020 (pre-pandemic).

Freight

1.512 billion tonnes of freight transported in 2023, contributing to 1.5% of India's GDP.

Network

128,305 km of track length, including 60,814 km electrified for cleaner operations.

Locomotives

Over 13,000 locomotives, with plans for further electrification and modernisation.

Stations

Over 7,300 stations, with continuous upgrades and modernisation efforts.

A snapshot of contribution to the economy

| Employment	Trade and industry	Tourism	Infrastructure development	Social development
Largest employer in India, providing direct and indirect jobs to millions.	Facilitates movement of goods across the country, boosting economic activity.	Connects people and places, promoting tourism and cultural exchange.	Drives infrastructure development in rural and remote areas.	Enhances access to education, healthcare, and other essential services.

The unreserved ticketing system: Historical perspective and present status

The Indian Railways devised the unreserved ticketing system (UTS) in 2001-02, initially piloting it at 23 locations in Delhi. The Centre for Railway Information System (CRIS) oversaw hardware procurement and software development, commencing in August 2002. The UTS has since been implemented across all Indian railway zones.

The UTS offers passengers the convenience of purchasing unreserved tickets up to three days in advance for any destination served by the station. Ticket cancellation procedures have also been simplified, allowing cancellations up to one day before the journey from any station with a UTS counter. On the day of travel, tickets can be cancelled from any station within the designated cluster for the journey's commencement.

Built on a UNIX operating system, the UTS features a C++ language interface for the front end and utilises SYBASE for the backend database. The UTS database is maintained on servers positioned at seven key locations nationwide, including Mumbai, Delhi, Kolkata, Chennai, Secunderabad, Gorakhpur, and Patna.
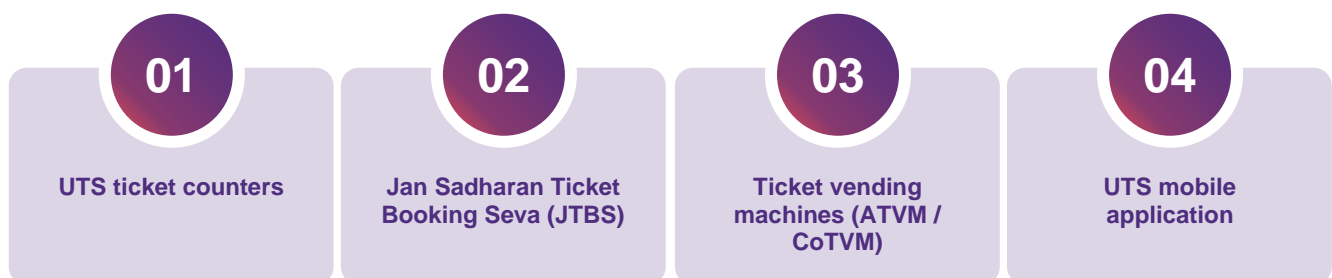
Number of locations with UTS
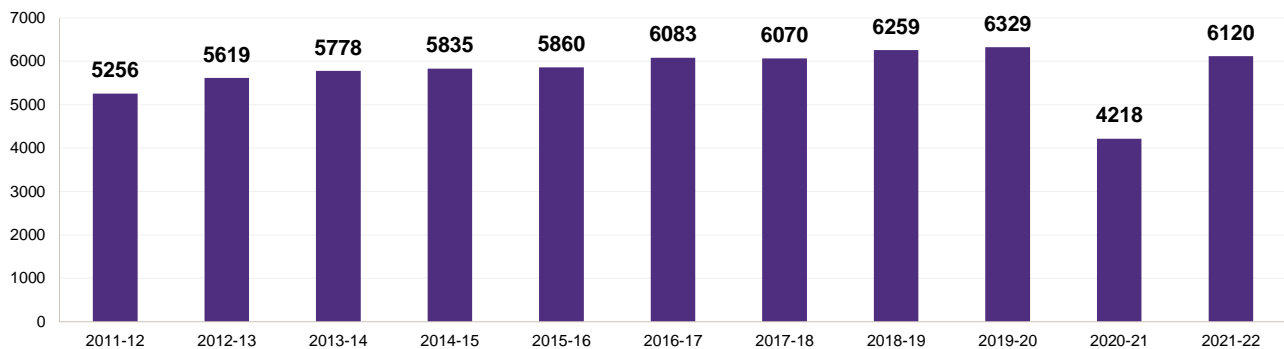
Source: Ministry of Railways Annual Report

[1]Since its inception, there has been a steady increase in the number of locations with a UTS. As of the end of FY 2022, the UTS facility is available across 6,120 locations. FY 2020-21 and FY 2021-22 can be seen as outliers. During this time, the Indian railways decided to close down the UTS facility at several locations due to the COVID-19 lockdown, which affected train travel significantly across India.

Various channels available under UTS

01 UTS ticket counters

02 Jan Sadharan Ticket Booking Seva (JTBS)

03 Ticket vending machines (ATVM / CoTVM)

04 UTS mobile application

Source: Railway filings, GTB research

Launch of the UTS mobile application – Heralding a new era in unreserved ticketing

The UTS application for mobile phones, known as UTSONMOBILE, has revolutionised how passengers in India book and use unreserved train tickets. This mobile application, introduced by the Indian railways, offers an alternate virtual channel for procuring unreserved, season and platform tickets.

While the decision made by the CRIS to introduce a mobile application for unreserved ticketing marked a significant milestone, it is essential to highlight that the remarkable success witnessed in reserved ticket bookings through the IRCTC, in conjunction with private OTAs integrated with the IRCTC, has not been replicated by the UTS application. Despite being in existence for several years, the adoption and usage of the UTS application have been limited, which can be attributed to various factors.

One of the primary reasons contributing to the subdued uptake of the UTS application is CRIS's strategic choice to restrict private OTAs from integrating with it to facilitate unreserved ticket bookings through their platforms. Unlike the seamless collaboration seen in the reserved ticket booking realm, this decision has hindered the widespread utilisation of the UTS application. This limitation has, in turn, impacted the application's ability to tap into the potential user base that private OTAs could bring, hindering its overall growth and user engagement.

As a result, despite the pivotal nature of the decision to launch the UTS application, its full potential is yet to be realised, and addressing the limitations associated with the non-involvement of private OTAs in unreserved ticketing could prove instrumental in unlocking greater success for this mobile ticketing solution.

It would be worthwhile to briefly analyse the IRCTC's success story and private OTAs' role in democratising reserved ticketing through mobile applications.

Success of IRCTC – Shining example of public-private-partnership

The IRCTC success story

The IRCTC was established in September 1999 as a subsidiary of the Indian Railways to handle online ticketing, catering, and tourism operations. Its primary objective was to modernise ticketing services and provide a more efficient and customer-friendly booking system for the vast railway network in India.

In 2002, the IRCTC launched its online ticketing portal, revolutionising railway ticket bookings in India. The portal allowed passengers to book tickets from the comfort of their homes, reducing long queues and making the process more convenient and accessible.

Since its inception, IRCTC has experienced significant growth in the number of e-tickets booked through its app. In FY 2022-23, the IRCTC booked an average of 11.82 lakh e-tickets, generating INR 1,198 crores in business segment revenue, a 17.45% increase from the previous year. The IRCTC app has a massive customer base of 13.97 crore users and provides a range of online travel products, including air and bus ticketing, retiring room and hotel booking, and tour packages.

YoY E-tickets booked on IRCTC Platform (No. of tickets in crore)
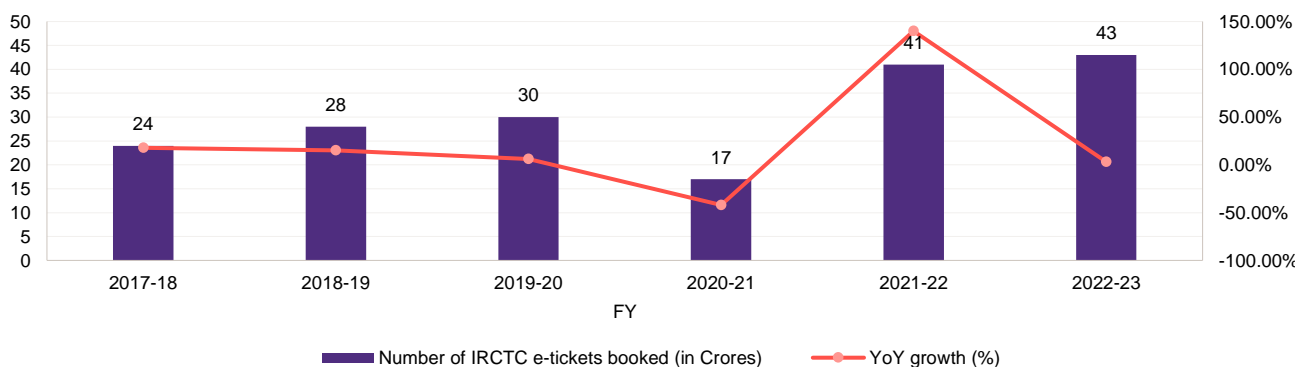
Source: IRCTC Annual Report

A total of 4,313.00 lakhs tickets were booked in 2022-23 compared to 4174.49 lakhs in 2021-22, **thus registering a CAGR of 12.4%.** A total of 7,706.40 lakh passengers got booked on e-tickets in 2022-23 compared to 7,343.26 lakh passengers booked in 2021-22. The ratio of passengers to tickets during the year was 1.79:1.

One of the key reasons for the spectacular growth of the IRCTC has been its decision to allow private OTAs to integrate with its platform, allowing such OTAs to facilitate seamless ticket booking for end users.

Role of private OTAs in growth of reserved ticket booking:

One of the critical drivers for democratising reserved ticket booking is IRCTC's decision to allow private OTAs to integrate with IRCTC's platform for reserved ticket booking. Private OTAs have provided unprecedented ease and access to reserved ticketing, along with the following benefits:

- Private OTAs already had a large user base who got ready access to the railway reservation system through this integration.
- Private OTAs provided an extraordinarily smooth and streamlined user interface for booking online tickets, ushering unprecedented ease to end users.
- Private OTAs already had tie-ups with licensed payment aggregators and payment gateways, which provided end users the flexibility to opt for multiple modes of digital payments.
- Private OTAs also ensured the data security and privacy of end users.
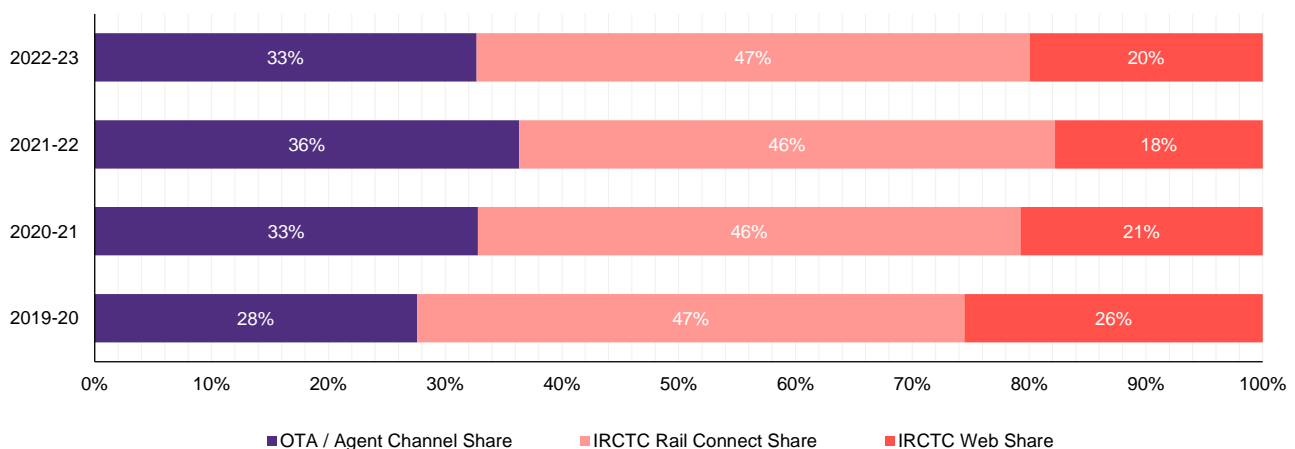- Private OTAs also handle dispute resolution and chargeback.

Growth of market Share of Agents (OTA) in Reserved Booking
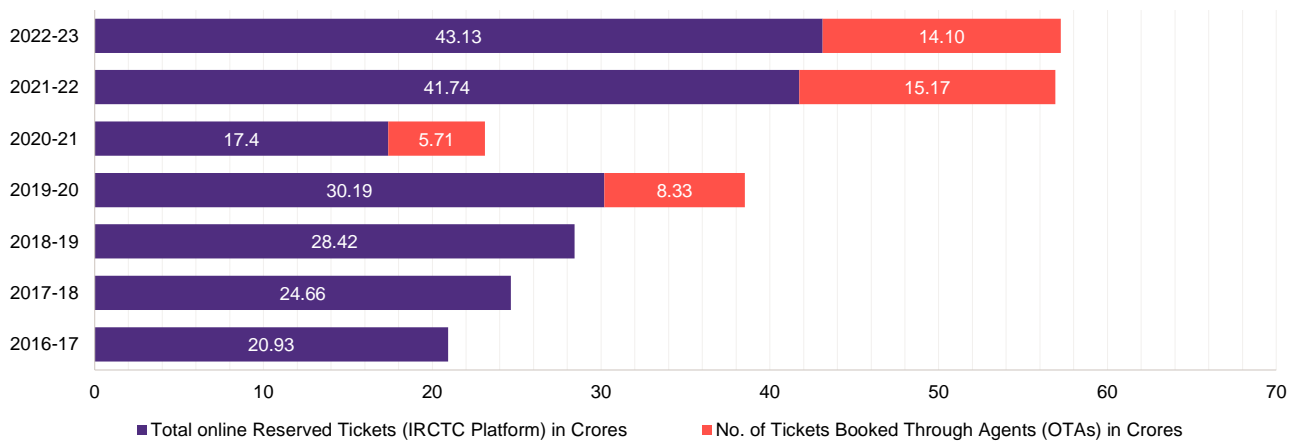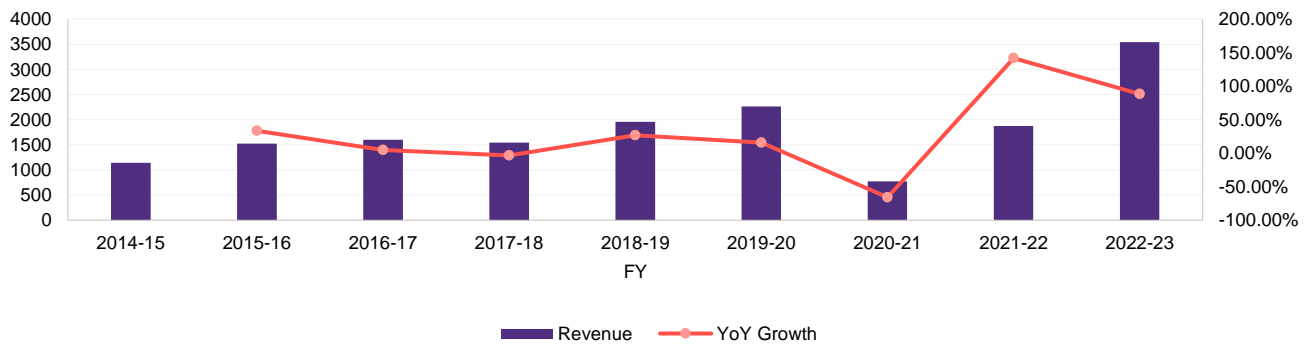

Source: IRCTC Annual Report & GT Analysis

As evident from the above chart, OTAs/agents are now responsible for booking around 15 crore tickets annually.

Reserved ticket booking channel share (in %)


Source: IRCTC Annual Report

IRCTC revenue

The revenue of IRTCTC has also shown an overall increasing trend, growing from INR 1,141.21 crore in FY 2014-15 to INR 3,541.47 crore in FY 2022-23. The positive growth trend after 2017 suggests that integrating OTA for reserved ticket booking has been a fruitful strategy for IRCTC. It has likely enhanced user convenience and expanded the customer base. To further capitalise on this success, there could be potential benefits in extending the OTA integration to unreserved ticket booking. This expansion could attract a broader range of customers, potentially leading to increased revenue for IRCTC.

With the ongoing digital transformation and increasing reliance on online platforms for ticket bookings, IRCTC is well-positioned to leverage its OTA integration to tap into the unreserved ticket segment. This move may contribute to additional revenue growth in the coming years.

Latent opportunity for CRIS and private OTAs

The data analysis of the number of reserved versus unreserved passengers over the past five years reveals a noteworthy and consistent trend. Notably, the proportion of unreserved passengers consistently surpasses that of reserved ticket holders. Over the period spanning the fiscal year 2017-18 to fiscal year 2021-22, the average **percentage of unreserved passengers stands at about 87% of the total passenger count.**

Reserved Vs unreserved passengers (in million)
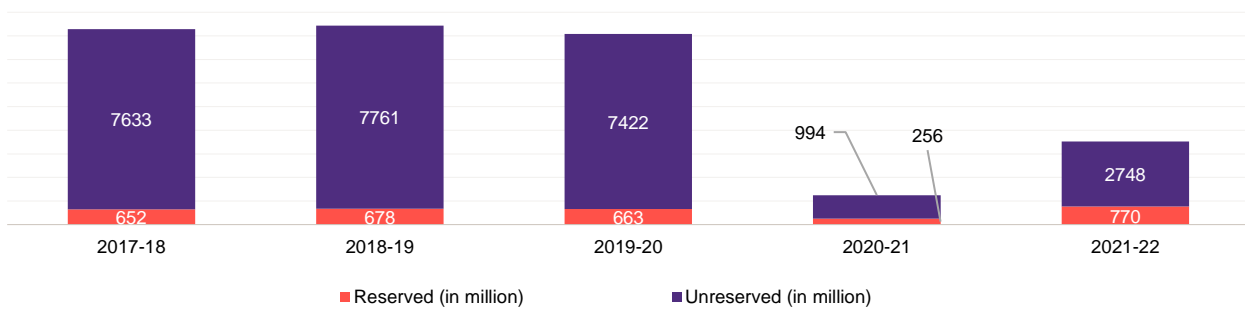
This significant prevalence of unreserved passengers creates a substantial opportunity for collaboration between the CRIS (Centre for Railway Information Systems) and private OTAs. If both entities decide to work in coordination, they could capitalise on this large segment of the population. Transitioning this considerable number of unreserved passengers to embrace digital ticketing entirely can alleviate the strain on the existing physical infrastructure, ticket counters, and vending machines within the Indian railways system.

For the Indian railways, the shift to digital ticketing among the unreserved passenger demographic could substantially reduce the operational burden associated with traditional ticketing methods. This transition promises increased efficiency, streamlined processes, and enhancement of the overall passenger experience.

Simultaneously, private OTAs stand to benefit by tapping into their existing user base. The collaboration could give them an unprecedented opportunity to introduce innovative tariff structures and offer users enhanced convenience in digital ticketing.

By leveraging their technology platforms, private OTAs can contribute to modernising the railway ticketing system, providing users with a seamless and user-friendly experience while potentially expanding their market share in the online ticketing domain. Overall, the potential collaboration between the CRIS and private OTAs presents a win-win scenario, offering efficiency gains for the Indian railways and business expansion opportunities for the private sector.

How UTS app works

The UTS app, launched by the Indian Railways in November 2018, is a general ticket booking app that allows passengers to buy unreserved paperless tickets for a journey between two stations. UTS tickets are unreserved paperless tickets, which one can also print through ATVM/CoTVM/OCR machines. A user can register by verifying their mobile number, and entering their name, password, gender, and date of birth in the given column. When the registration is done, an SMS with a login ID and password is sent to the number, and a zero-balance R-wallet is created without any additional cost.

The UTS app provides a user-friendly interface with options for normal booking, including paperless and paper ticket choices. Users can opt for ' Book and travel ' for a paperless journey within a 2 km range of the station, while 'Book and print' allows tickets to be purchased from anywhere, requiring a printout at the originating station. Quick booking streamlines the process for regular users with favourite routes. The app also offers easy platform ticket booking, eliminating the need for physical queues. Season tickets are available for specific routes, supporting instant travel and printing options.

The R-Wallet feature on the UTS app streamlines ticket booking with multiple options. Users can recharge their R-Wallet, saving time during urgent ticket purchases. Recharge can be done in multiples of hundreds, with a minimum of INR 100 and a maximum of INR 10,000. The 'Current balance' option displays the available funds, while the 'Recharge history' provides a record of previous transactions. Users can also opt to 'Surrender R-Wallet' for a refund, receiving a code via SMS for in-person redemption at the booking counter, subject to applicable clerical charges and varying surrender policies.
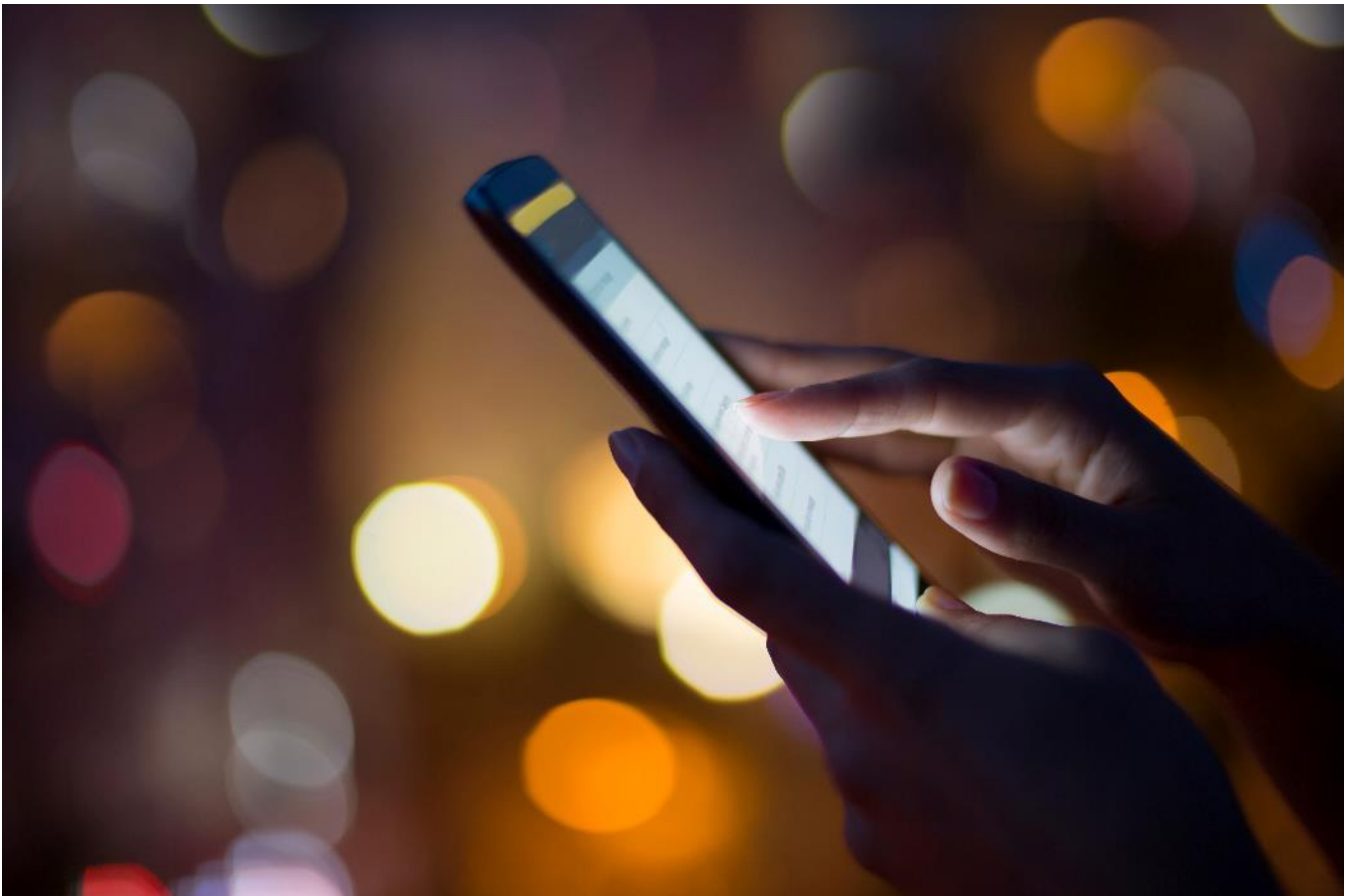
Demonstrating positive impact

Integrating unreserved tickets in India with OTA apps holds numerous benefits for both the Ministry of Railways and consumers. From the Ministry's perspective, it will have the following benefits:

Reduction of concurrent user load

Integrating unreserved tickets with OTA apps in India brings about a notable decrease in concurrent user load on the IRCTC app and website. This is a significant advantage, as it disperses the burden of ticket bookings across multiple platforms, minimising the strain on the IRCTC infrastructure during peak hours. By doing so, the integration mitigates the risk of transaction failures and dropouts, ensuring a more stable and efficient ticketing process for users. This reduction in concurrent user load not only improves the overall reliability of the IRCTC platform but also contributes to a smoother and more streamlined ticket booking experience for passengers. Distributing ticket bookings across OTA apps decreases the load on the IRCTC app and website and mitigates the risk of transaction failures and dropouts during peak periods.

Increase in revenue

The integration introduces a substantial opportunity for the Ministry of Railways to increase revenue. By collaborating with popular OTAs, the railway system gains access to a broader user base, leading to a surge in unreserved ticket bookings. The partnerships with these widely used apps also create additional revenue streams, reducing the dependency on a singular channel for income. This collaborative approach not only boosts revenue for the Ministry but also stimulates economic activities in the broader travel and tourism sector, contributing to the overall growth of the transportation industry.

Reduction in infrastructure costs

The opportunity brings about a potential reduction in infrastructure costs for the Ministry of Railways. By distributing the load of ticket bookings across OTA platforms, the strain on the IRCTC infrastructure diminishes, resulting in optimised resource utilisation. This reduced the demand for processing and storage requirements, which can lead to cost savings related to maintaining and upgrading the platform. The collaboration streamlines operations and contributes to more cost-effective and sustainable management of the railway ticketing system, aligning with broader efficiency goals for the Ministry.

Additional revenue streams

This integration opens new avenues for IRCTC to diversify its revenue streams. By collaborating with popular OTA platforms, IRCTC can tap into the user bases of these widely used apps, leading to increased unreserved ticket bookings. These partnerships not only enhance the overall reach of the IRCTC but also create additional sources of revenue beyond traditional ticket sales. As users seamlessly incorporate unreserved tickets into their travel plans through these apps, the IRCTC benefits from a more varied and resilient revenue model, reducing reliance on a singular channel and fostering financial sustainability.

Benefits for consumers

- **Enhanced convenience:** Integrating unreserved tickets with popular OTA apps offers users unparalleled convenience by allowing them to seamlessly add railway bookings to their travel plans within platforms they frequently use. Users can enjoy a one-stop-shop experience, eliminating the need to switch between different apps for varied travel services, resulting in a streamlined and efficient booking process.
- **Access to additional services:** Users leveraging OTA apps for unreserved tickets gain access to many additional travel services and information, including hotel bookings, itinerary planning, and travel recommendations. This integrated approach enhances the overall travel experience, providing users with comprehensive tools to plan and manage their entire journey in a single platform.
- **Familiar and user-friendly interface:** Integration with well-established OTA platforms ensures that users encounter familiar and user-friendly interfaces, reducing the learning curve and making the ticket booking process more accessible. These widely used apps enhance the overall user experience, promoting ease of use and a seamless navigation process for novice and experienced travellers.
- **Flexible payment options:** Users benefit from the diverse payment options provided by OTA apps, including digital wallets, credit/debit cards, and net banking, offering flexibility and convenience in managing travel expenses. This flexibility contributes to a more personalised and user-centric experience, catering to various preferences and ensuring a hassle-free payment process for all users.

Addressing operational and revenue challenges

While proposing the integration of private OTAs with CRIS for unreserved ticketing, it would be worthwhile to consider various operational and revenue-related challenges that this integration might pose. This section tries to highlight such challenges and propose likely solutions to these challenges with a view that serves the purpose of protecting the interests of both CRIS and the private OTA ecosystem.

Allowing physical printed tickets on plain paper may lead to misuse. OR passengers sharing image copies of QR codes to multiple travellers, leading to revenue leakage.	**Tickets may be booked when checking through apps, causing revenue leakage.**	**TTEs (Travelling ticket examiners) lack reliable internet connections during inter-station transit for online ticket validation.**	**Unreserved tickets are not mapped to the user, a train, or a berth.**
Physical tickets issued through UTS counters and vending machines are printed on unique paper stationery, which cannot be replicated, hence ensuring that no duplication or forgery is possible by end users. Allowing private OTAs to print tickets on plain paper may lead to duplication, as making copies of the same ticket would be easy.	Providing instant ticket booking during the journey poses a severe potential for revenue leakage. Travellers would deliberately travel without a ticket and procure the ticket on the app only when ticket checking has been done. This would be especially problematic in suburban trains where ticket checking during the journey is practically non-existent. Moreover, considering the size, spread, and scale of the Indian railways, ensuring watertight barricading (access control) in all stations is almost impossible, making ticket checking at entry/exit difficult.	QR code-based tickets/tickets generated through apps would need an active internet connection to validate them. Very frequently, TTEs conducting the checking during the journey or ticket collectors (TCs) posted at exit gates do not have reliable internet connectivity, making it difficult to validate such tickets.	Since unreserved tickets are not mapped to any end-user or a specific train/berth, it would not be possible to account for the total tickets issued by private OTAs. Under the present system, since tickets are issued by CRIS's platform (although through different channels), IR can track the exact number of tickets issued. This tracking allows IR to regulate/control the sale of unreserved tickets during emergencies or a sudden surge in passenger traffic, thus limiting the crowd inside unreserved coaches.

While the concerns mentioned above are quite genuine, it would be worthwhile to consider the suggestions below, which, if implemented, will provide working solutions to the above challenges. Notably, most of the challenges mentioned above also apply to the UTS application developed by CRIS (available for both Android and IOS). However, CRIS has taken multiple technical measures to address these leakages, which are discussed in detail here. It may also be noted that the same checks and measures can be implemented on private OTA applications. The following table maps these challenges against the proposed solutions:

Anticipated challenges	Implementation in the UTS application	Proposed measures for private OTA applications
Allowing physical printed tickets on plain paper may lead to misuse. OR passengers sharing image copies of QR codes to multiple travellers, leading to revenue leakage.	The UTS application does not allow tickets to be printed on plain paper. The traveller can either generate an e-ticket with a QR code or generate an acknowledgment with a unique transaction number. The traveller can show this acknowledgment at physical UTS counters or vending machines at the station to collect the physical ticket.	A similar workflow can also be easily adopted for all private OTA applications. Each ticket issued by the OTA app will have a similar unique serial number, which could be tracked at the CRIS backend. For physical tickets, the generated acknowledgment could also be used to get physical tickets from the UTS counter. OTAs can effectively prevent sharing images of tickets' QR codes by disabling the

		sharing on the device if the SDK / API route is allowed.
Unreserved tickets are not mapped to the user, a train or berth, or inventory management.	Since the UTS application is integrated with the CRIS stack, all tickets issued through the application can be tracked individually. If and when needed, CRIS can regulate the number of tickets issued through the app. Finer controls (on specific routes/trains/categories) can also be effectively controlled.	OTA applications will be integrated with the CRIS backend through secured APIs. Therefore, all control logic applicable to the UTS application can also easily be replicated on OTA applications. Restriction on the issuance of tickets on specific sectors may also be implemented by passing on the search context to UTS backend, basis which IRCTC can provide OTAs as to whether to issue tickets for that sector and date combination. Further, technical audit obligations may be imposed on OTAs to demonstrate that such controls have been appropriately implemented.
Tickets may be booked when checking through apps, causing revenue leakage.	The UTS application mandates are used to provide GPS access on the device. Using precise GSP coordinates, the UTS application implements geo-fencing logic to ensure that tickets can be booked only if the traveller is up to 5 km from the station and is not within 15 meters of the railway track. This ensures that travellers cannot book tickets on the spot / before the checking happens, thus plugging revenue leakage.	Similar ring-fencing logic can be implemented for all OTA applications as well. There can be several possible technical measures to ensure a similar geo-fencing implementation: • Private OTAs do an app-in-app integration of the UTS app itself. • The SDK approach, wherein CRIS makes the software development kit available to private OTAs. Can OTAs integrate the UTS SDK and pass on the GPS coordinates to CRIS? • CRIS can make secured APIs available to OTAs. The APIs will encapsulate the same logic CRIS implemented in their app. Under this arrangement, OTAs can pass the parameters they need for validation, and the CRIS still controls the logic. Regular audit/ data sharing can be made as a policy to ensure no violation.
TTEs lack reliable internet connections during inter-station transit for online ticket validation.	This issue is not related to the app but is rather an infrastructural challenge.	OTAs may be allowed to maintain a local cache on a device, which could be used to validate tickets and, on availability on the network, can be synced with the server – on similar lines to UPI lite.

Recommendations

Allow private OTAs to integrate from CRIS for the issue of unreserved tickets and platform tickets.

- **Viable commercial model:** Substantial cost is incurred by the Indian Railways to issue millions of unreserved tickets in hard copy, along with the cost of maintaining thousands of physical ticket counters. Allowing OTAs to issue such tickets, coupled with their active marketing initiatives, will result in substantial savings to the Indian railways, a portion of which may be passed on to travellers and OTA platforms. The UTS application provides a 3% cashback to the user for adding credit to their wallet. As more and more cost efficiency is gained (due to the shift of load from physical counters), a viable revenue-sharing model may be adopted.

- **Liability for fraud prevention:** Clearly define the liability for any fraudulent activities or preferential booking parameters, placing the responsibility on the private OTA apps. This approach incentivises these platforms to invest in stringent security measures and employ proactive fraud detection mechanisms, thereby ensuring the integrity and trustworthiness of the entire ticketing process. CRIS may issue appropriate regulations to ensure OTA applications incorporate appropriate checks to address challenges highlighted in the preceding section. The requirement for an annual technical audit may also be considered to ensure that proper checks are maintained.

- Propose **a comprehensive set of fraud prevention measures** to be implemented collaboratively with OTA platforms. This includes the integration of multi-factor authentication, biometric verification, and real-time transaction monitoring. Regular security audits and assessments should be conducted to identify and address potential vulnerabilities, maintaining a secure and reliable ticketing environment.

- **Mandate** private OTAs to implement appropriate customer grievance mechanisms and mechanisms for the prevention of financial fraud on their platform.

Proposed implementation model

Pilot phase

The integration will be initiated by implementation in a pilot phase covering 10 locations for the first 6 months. This phased approach allows for thorough testing of the integrated system in real-world conditions, enabling the identification and resolution of any potential issues before a full-scale rollout. Regular feedback from users and stakeholders during this phase will be invaluable for fine-tuning the system.

Gradual expansion

Following the successful completion of the pilot phase, the integration will gradually expand the system to cover all UTS locations. This controlled scaling approach ensures manageable implementation and allows continuous monitoring and adjustments. It minimises the risk of system overload, providing a smooth transition for railway staff and passengers.

Stakeholder collaboration

It would be vital to foster close cooperation and communication with key stakeholders, including OTA partners, CRIS, railway staff, and end-users. Regular feedback loops and communication channels will be established to address any issues or concerns during the implementation promptly.

Training and awareness

Comprehensive training programmes may be conducted for the railway staff and OTA platform operators to facilitate a seamless transition to the new integrated system. Training should cover system functionalities, security protocols, and troubleshooting procedures. Simultaneously, awareness campaigns should be launched to inform passengers about the advantages and procedures of booking unreserved tickets through OTA apps, promoting user adoption and satisfaction.

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About IAMAI

Established in 2004, the Internet and Mobile Association of India (IAMAI) is a not-for-profit industry body representing the digital industry. With 590 members, including Indian and multinational corporations, as well as start-ups, IAMAI has been instrumental in shaping India's digital economy. IAMAI advocates free and fair competition, and progressive and enabling laws for businesses as well as for consumers. The overarching objective of IAMAI is to ensure the progress of the internet and the digital economy. Its major areas of activities are public policy and advocacy, business to business conferences, research, and promotion of start-up.

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