WI-FI-BASED UNRESERVED RAILWAY TICKETING SYSTEM: UTS REVISED

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Today's biggest challenge in current ticketing system is "QUEUE" in booking railway tickets. In today's intensively fast growing world of technology we still are standing in queue for buying railway ticket or to buy CVM coupons or smart cards. This is more irritating and time consuming at times to stand in the queue or if we forget our cards. And we are wasting papers where in today's needs we need to save the paper. So paperless Mobile Suburban Railway (MSR) ticketing is mainly to buy the suburban tickets which is the most challenging when compared to booking the long journey tickets through `M-ticket' which fails with suburban(local travel) tickets. Our MSR ticket can be bought with just a smart phone application, where you can carry your suburban railway tickets in your smart phone as a QR (Quick Response) ticket. The ticket will have distinct color scheme everyday and it cannot be forwarded to another mobile. Our MSR- tickets system is one of the best opportunities for those who cannot afford enough time to get their tickets standing in long queues.

UTS: Unreserved Ticketing System.

MSR Ticket: Mobile Suburban Railway Ticket.

Keywords:(MSR) *Mobile Suburban Ticketing, Smartphone's, Wi-Fi router, System Server.*

I. INTODUCTION

Indian Railways is the largest railway network in Asia, but not all figures are as impressive. For instance, almost 21 million people travel every day, are on unreserved tickets. This is a huge problem, but nothing new, and the Indian Railways had realized the need for an Unreserved Ticketing System a long time ago.

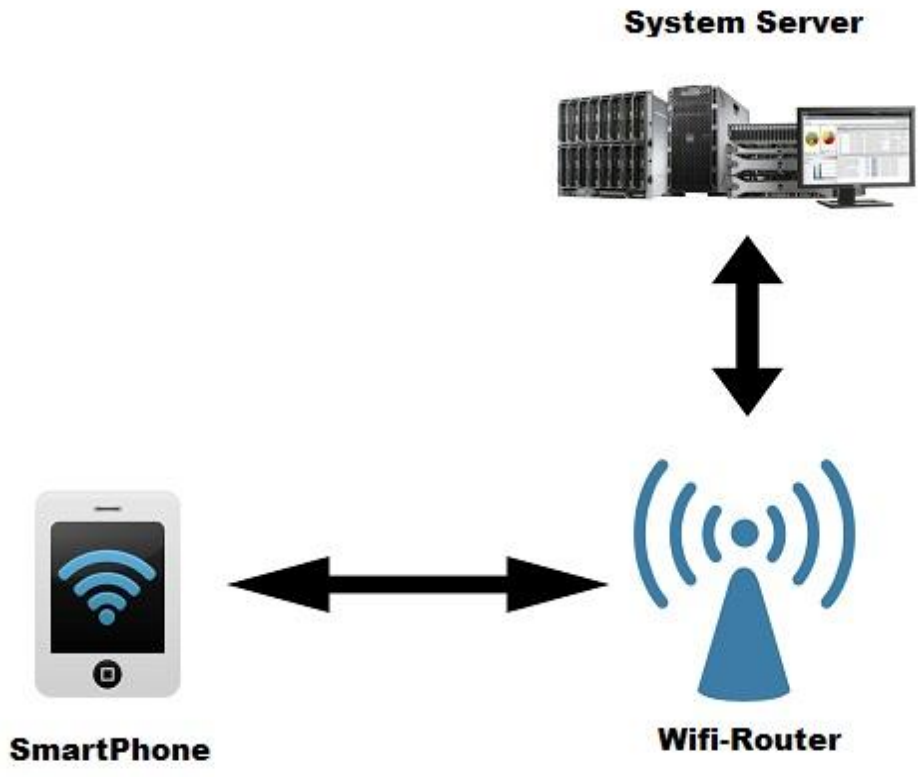
The current ticketing system is causing increase in travel time due to big drawback " long queues", which absorbs much significant portion of travelling time. On an average, a traveler spends 10 to 15 minutes in the queue at the suburban booking windows of Mumbai. ATVMs (Automatic Ticket Vending Machines) and CVM (Coupon Validating Machines; technologies are already implemented in the Unreserved Suburban Railways. Recently, Indian Railway has launched the facility of booking unreserved suburban tickets on smart phones. As of now the Mobile UTS (Unreserved Ticketing System) System has been introduced in Mumbai and Chennai suburban areas only. The application has been developed in-house by Centre for Railway Information Systems (CRIS).The passenger has to book the ticket in the mobile phone and print the ticket on the ATVMs installed at the journey originating (Source) stations hence resulting in a paper based ticketing system. The passenger has to maintain a Railway Wallet(R-Wallet) with Railways to avail the facility. Instead of putting lots of effort by railways, the new ticketing system was also had certain flaws. So, quite an amount of research has also been carried out. Taking these aspects into consideration, an MSR ticketing has been proposed which generates the paperless ticket on the Smartphone with the help of a Wi-Fi-device deployed on source station. Here, instead of using mobile internet of commuters, a Wi-Fi device needs to be installed at each ticket counter which plays a very important role in M-ticketing. The passenger needs to visit the area within the reach of this device and try to connect it from their app in their device and they need to authenticate themselves. The Wi-Fi device sets the source station automatically and user needs to set the destination and number of tickets.

II. SYSTEM DESCRIPTION

Wi-Fi (or Wi-Fi) is a local area wireless computer networking technology that allows electronic devices to network, mainly using the 2.4 gigahertz (12 cm) UHF and 5 gigahertz (6 cm) SHF ISM radio bands. The Wi-Fi Alliance defines Wi-Fi as any "wireless local area network" (WLAN) product based on the Institute of Electrical and Electronics Engineers' (IEEE) 802.11 standards".

Wi-Fi based unreserved railway ticketing system consists of mainly 3 parts: One is Wi-Fi Routers to be placed at station. Wi-Fi router plays a key role in unreserved suburban railway ticketing system which acts as an intermediate between the database server and application system software (in Wi-Fi devices such as smart phones). Second is the smart phone which contains installed application. Third is the centralized System Server which handles all the

transaction related to ticket booking, authentication, authorization, and R wallet related details and manages user request reply tasks easily.



The WI-Fi Routers needs to be placed at each ticket counters. The passenger needs to visit the area within the reach of this device and try to connect it from their app in their device and they need to authenticate themselves. The Wi-Fi device acts as an intermediate and authenticates the user with the help of data in the system server. After authentication, when user wants to book ticket, the router id is traced and source station is set automatically and user needs to set the destination and number of tickets. The System server checks the available amount in the Rwallet. If sufficient amount of balance is found, and then ticket will be printed else it leads to an error.

III. COMPARISION & BENEFITS OVER CONVENTIONAL SYSTEM

In conventional paper based ticketing, each & everyday a lot of tickets are being printed by the person sitting in the railway ticket counter or through ATVM or CVM machines. Even the newly introduced UTS application is not paperless as the passenger has to book the ticket in the mobile phone and print the ticket on the ATVMs installed at the journey originating (Source). After

finishing travelling, the passengers usually through away the tickets here & this ultimately pollutes the environment. Again large number of trees is being destroyed since the current system uses paper based ticketing and the used tickets are just wasted. But in our proposed system.MSR ticket can be bought with the application loaded in smart phones, where you can carry your railway ticket in your Smartphone. The ticket will have unique color scheme everyday and it cannot be forwarded to other traveler. This Wi-Fi based unreserved railway ticketing system enables operators such as railway authorities to save time and personnel costs; fare collection can be organized much more efficiently. These systems require low maintenance costs and reduced fraud-induced losses represent further advantages.

ATVMs (Automatic Ticket Vending Machines) technology was introduced in the Suburban Railway in order to curb the long queues for tickets. The major drawback with the existing ATVM is the scalability issue. Only 6-7 tickets can be issued per minute through an ATVM. Another major issue with this system is the cost of installing the machine. Each machine costs around 175000 INR excluding the maintenance costs which vary according to the usage intensely. Another issue is the there are various public grievances reported regarding the functioning of the ATVM. Instead of hopping from machine to platform, passengers have to hop from one machine to another as most are non-functional. Another major issue is that each machine occupies 2m x 3m x 3m which is a major concern in existing densely populated railway stations. The proposed system eliminates all these issues. Hundreds of tickets can be booked easily within a minute and the cost of installation is very less compared to ATVM machines. UTS, the newly launched railway application is not consistent and totally helpful as the passenger needs to book ticket online and then has to wait for printing ticket it at ATVM machines. The up gradation to these existing system needs each and every device to be updated hence resulting in a High Up gradation and maintenance cost. The proposed system is beneficial, and operated from a centralized server, easily upgraded and easily maintained and doesn't need an internet connection as tickets can be booked with the help of Wi-Fi router.

IV. OPERATIONAL PRINCIPLE OF PROPOSED SYSTEM

The Mobile UTS Application is available for the Windows and Android platform. Users can download the mobile ticketing application from the appropriate application store. Registration can be done through mobile phone app or website utsonmobile.indianrail.gov.in. The passenger should first get registered by providing his/her mobile number , name, city, default booking train

type, class, ticket type, number of passenger, and frequently travelling routes. Upon successful registration, Railway Wallet (R-Wallet) will be created automatically with zero balance to the passenger. There will be no extra cost for creating R-Wallet. The passenger can go to any of the UTS counter to recharge their R-Wallet or can recharge it though the website. Railway wallets are closed wallets and will be used only for Rail ticket booking.

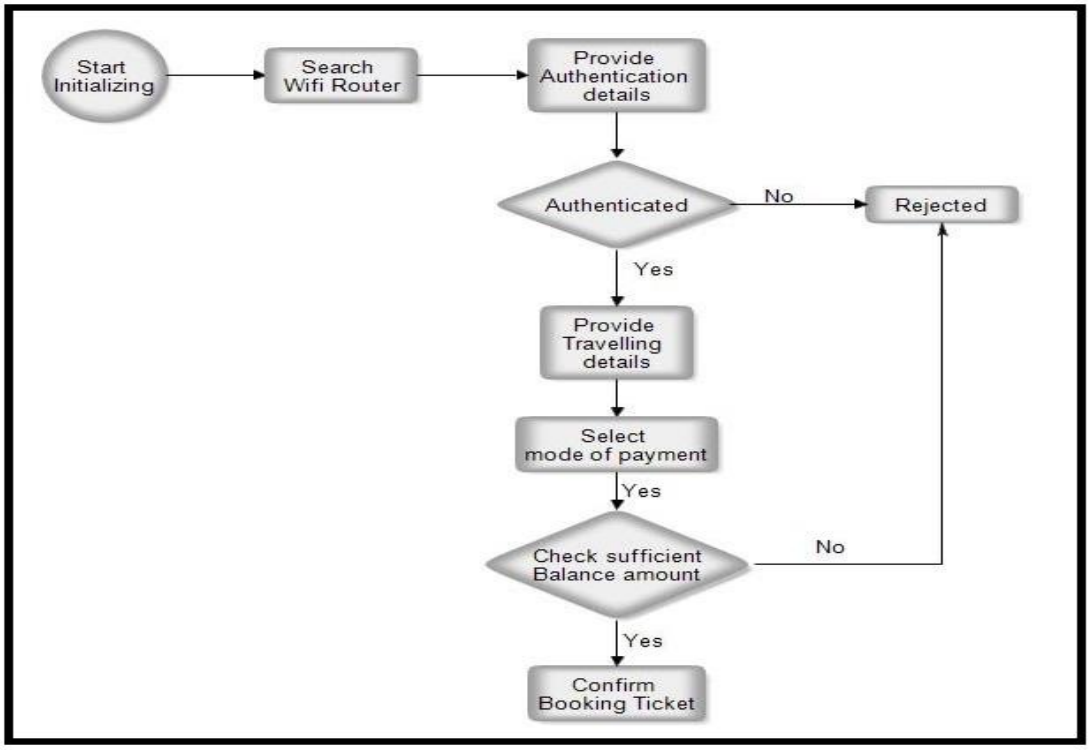
The passenger needs to visit the area within the reach of this device and try to connect it from their app in their device and they need to authenticate themselves. The Wi-Fi device sets the source station automatically and user needs to set the destination and number of tickets. At the time of ticket booking, the application will check whether the R-Wallet account is having sufficient balance to book the ticket and if the amount is sufficient, then the ticket fare amount will be deducted and ticket will be booked. In case of emergency, if the passenger does not have sufficient balance, then he can even book tickets by paying it through the mobile main balance of his registered number. Using the website the user can see the Rwallet current balance as well as User can Recharge (Top-Up) the Wallet, using the payment options as Internet Banking & Debit Card facility. Money is deducted from user's account and his wallet will be credited after successful transaction. User can check already booked ticket from this website, He can also check the cancelled ticket and he is also able to check the Wallet recharge history and check whether the transaction is successful or not. Upon cancellation of ticket, the refund amount will be topped up in the R-Wallet. User can also change his profile. User can change his default journey attribute, city & already saved route. User can delete already saved route & he can create a new route also. Maximum five favorites route can be saved, which can be used for quick booking of the tickets. User can change his password using this website, which is more necessary for the security of the user account.

After the whole day, railway authorities can easily know how much credit has been transferred to the corresponding account and also the information can be found in the main database. Cross checking of all those information will allow better monitoring, transparency and thus reducing corruption.

V. DETECTION & PROCESSING ALGORITHM

The passenger will search for a Wi-Fi router installed at the respective ticket counter. Then user will connect to it using an app and authenticate himself. Once the user is authenticated the user can book tickets, check booking history, manage profile etc. While booking ticket the source

station will be set and passenger just needs to provide travelling details and mode of payment. The system will check for sufficient balance and if successful generate a quick response ticket to the Smartphone application.



CONCLUSION

The Unreserved Ticketing System (UTS) caters to this segment of the market and seeks to provide a centrally administered computerized ticketing system over the entire Indian Railways. The Wi-Fi based Unreserved ticketing application will be a boon to the new generation as it avoids the unnecessary waiting time at queue. This app makes train tickets just a click away. A blessing for daily commuters who will not have to stand in long queues anymore. This app could prove to be extremely useful for the tech savvy population that commutes by local trains. This technology supports paperless ticketing and hence beneficial to the environment. It costs less and can be upgraded easily.

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