



## Ticketing System of Indian Railways through SMS and Swapping Machine

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**Abstract:** *UTS ticketing through the computer and computerized reservation ticketing system came in existence in Indian railways in mid of 1985 with a solution of computerization in the ticketing system and tracking of the status of the reserved ticketing, but it creates a number of problems related to this newly implemented system, this paper is regarding the solutions of the problems related in consumption of time during the Ticketing Process in Indian Railways and the mode of payment other than the specified by the Indian Railways while taking ticket from their Ticketing Counters.*

**Keywords:**

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### I. Introduction

We generally face a critical problem of exact currency to be paid while taking railway reservation or unreserved ticket from the railways reservation or ticketing counter or there is sufficient change currency available at the counter at the time of ticketing. Normally the fare incurred during the ticketing is not in a multiple of 10, 50, 100, 500 or 1000. It may be any value like 367, 265, 592 or any thing, now, a customer will have a choice to pay exact amount at the time of ticketing or he/she may depend upon the booking clerk for the exact amount to be charged and the balance amount to be returned to the customer. Many a times, at the time of ticketing the cash available at the customer is not sufficient. It may be due to increase in the train fare or for any unwarranted reasons, but, one has a valid debit/credit card, In such cases, one has to go to the ATM machine first for the getting cash then only one is in a position to get the bonafied ticket.

The above two problems i.e. the lack of exact change money and insufficient cash available at the time of ticketing is a problem faced at the ticket counter and it creates a major problem at ticket counter, as it is non resolved problem and may be faced at the time of ticketing only and hence it consumes only the time of the ticketing without any solution or the business to the Indian railways or the ticket to the customer. It consumes time of the customer and it may happen that one may be in hurry to get train and he may unable to get ticket due to the said problem at the time of ticketing and one has to drop his/her idea to travel with the train of his choice according to his time and interest.

### II. Development In This Direction:

Railways recently launched a SMS-based ticketing with two dedicated numbers - 139 and 5676714 - for the service. In order to give improved customer service and empower the common man who does not have access to internet and cannot afford to buy smart phones, Indian Railways Launched SMS ticket booking service. This service will particularly be useful for Common man staying away from home as they will find the service convenient as well as cost-effective and they will not have to travel to booking counters and forgo the earnings for a day. Ticket booking through non-internet based mobile, launched as a pilot project by Indian Railways Catering and Tourism Corporation (IRCTC), will also help Railways overcome the menace of touts who fleece unsuspecting people. This will also help reduce touting activities. Since the mobile penetration in India has increased rapidly and more than 80 per cent people have mobile phones, the new system will be helpful in enabling booking of tickets by masses themselves. In order to facilitate easy access, railways have been making efforts by expanding the passenger reservation system counters' network. The online booking through IRCTC has now grown up to about 45 per cent of total reserved tickets.

This has eased the rush at counters to a great extent. While internet access in India is only about 10 per cent, mobiles are now in easy reach and more than 80 per cent people in our country use mobile phones. Railways' initiative of launching the ticketing through a mobile phone would further enhance the scope of ticketing since it has huge potential to tap the power of mobile phones. This service will improve further with provision of more payment options, user-friendly interface and value added services like alerts and updates. Payment through mobiles is still in an evolving state and commercial Banks, RBI and National Payment Corporation of India are working on providing a safe, secured and quick payment mechanism through mobile, with passage of time this mode of booking would surpass booking through website due to the convenience and the wider reach of mobile phones as compared to the internet. As per the requirement, one has to

register the mobile number with IRCTC as well as one's bank. The bank provides MMID (Mobile Money Identifier) and OTP (one time password) for authorization of payment. The passenger has to type the train number, destination, journey date, class and passenger details like name, age and gender on the SMS box. The sender will receive transaction ID and then make payment through sending another SMS by typing PAY followed by the transaction ID, MMID as received from the bank and password and with this the passenger's ticket is booked. The service is available to all mobile subscribers and Rs.3 is being charged per SMS and payment gateway charges are Rs.5 for ticket amount upto Rs.5,000 and Rs.10 for more than Rs.5,000.

**III. Proposed Action Plan for Cashless Transaction in Railways Ticketing System:**

In the era of globalization and Information Technology, everywhere at the point of sale, we found there are many ways for the payment i.e.

- 1) Cash
- 2) Debit Card
- 3) Credit Card
- 4) E-Vouchars
- 5) Net Banking
- 6) Point Redeems, and
- 7) Others

Now, we only rely on the cash transaction at the railways ticketing counters only, we may also offer other means of transaction for the payment at the Indian railways ticketing counters like payment through the plastic money like debit card or credit cards at the POS.

We may go for addition of the swapping machine at the railways ticketing networks and we may offer other ways for the payment of the ticketing amount other then cash to the customer like the payment through the cards at the time of ticketing, the said amount can be charged for the debit card/credit card swapping at the time of ticket.

The proposed system may solve the all envisaged problems of the exact cash or even the unavailability of the sufficient cash at the time of ticketing.

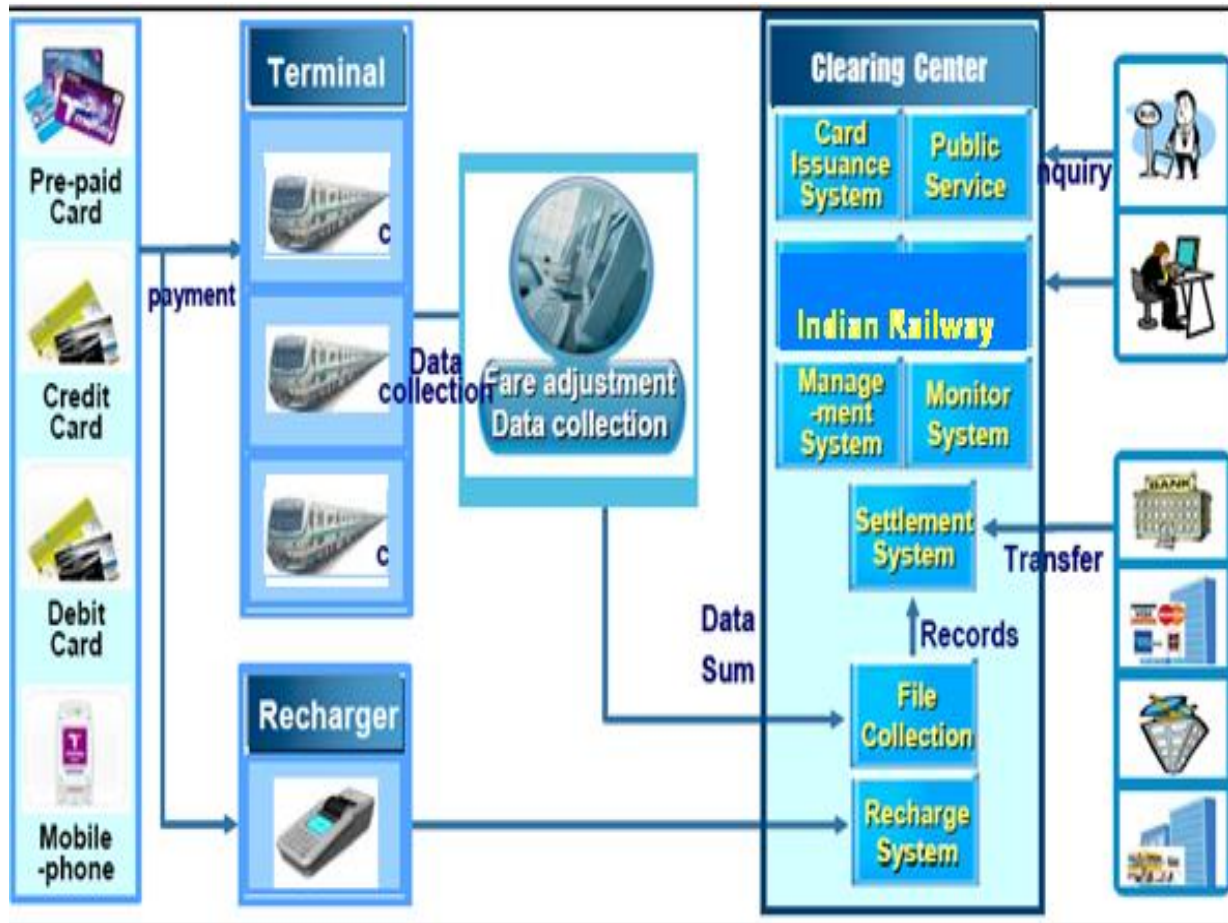


Figure 4.1

In figure 4.1 there are four ways of payment option available for the payment at the ticketing counter:

- 1) Pre-paid cards/Smart Cards/Loyalty Cards
- 2) Credit Cards
- 3) Debit Cards
- 4) Mobile Phones

The either of the above means can be used for the payment at the time of ticketing, The pre-paid cards can be issued by the Indian Railways and it can be obtained as a voucher at the railway stations or at any authorized retail shop, it may be used as an when required at the time of ticketing, there is possibility of the theft or unauthorized use of the pre-paid cards, but this can be checked with the integration of the pre-paid cards with the registered mobile number of the user and while ticketing the generated ticket will be sent to the registered mobile number only.

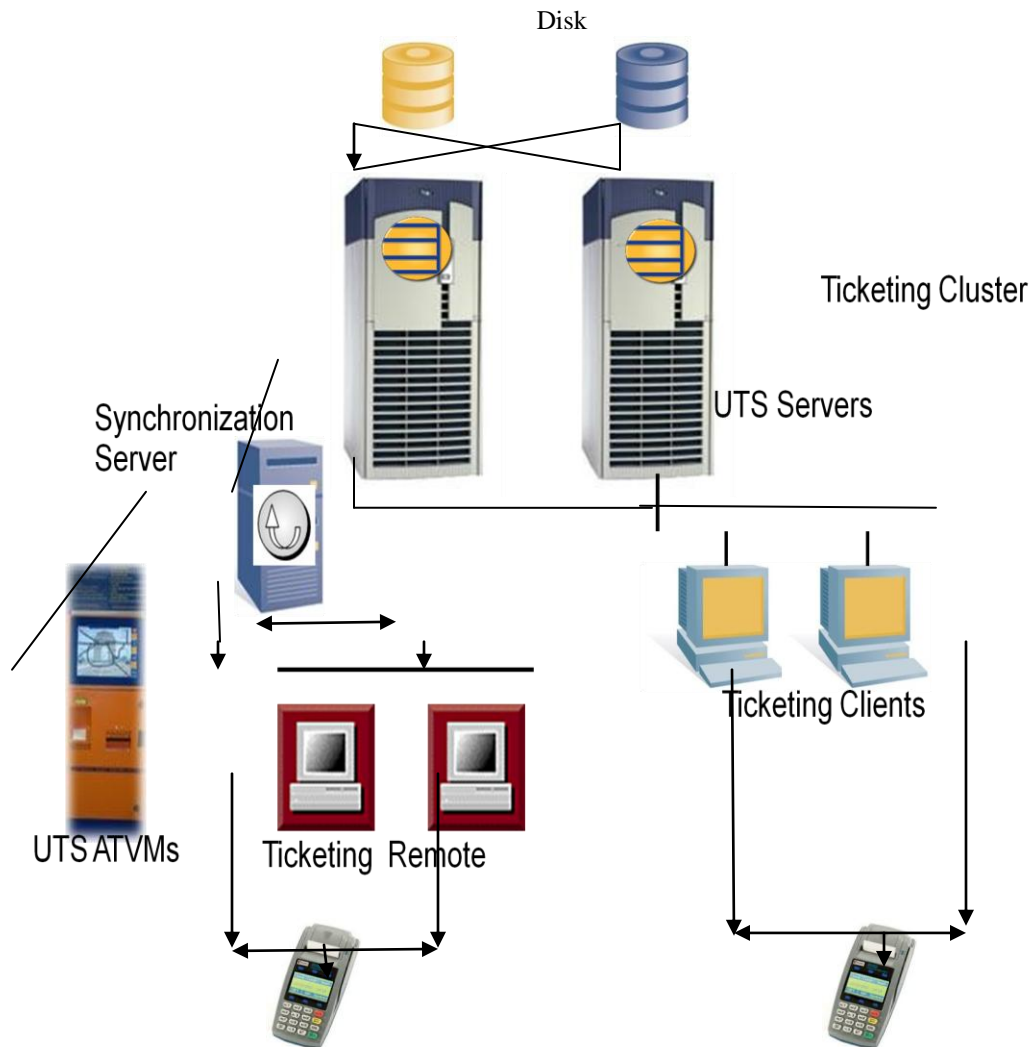


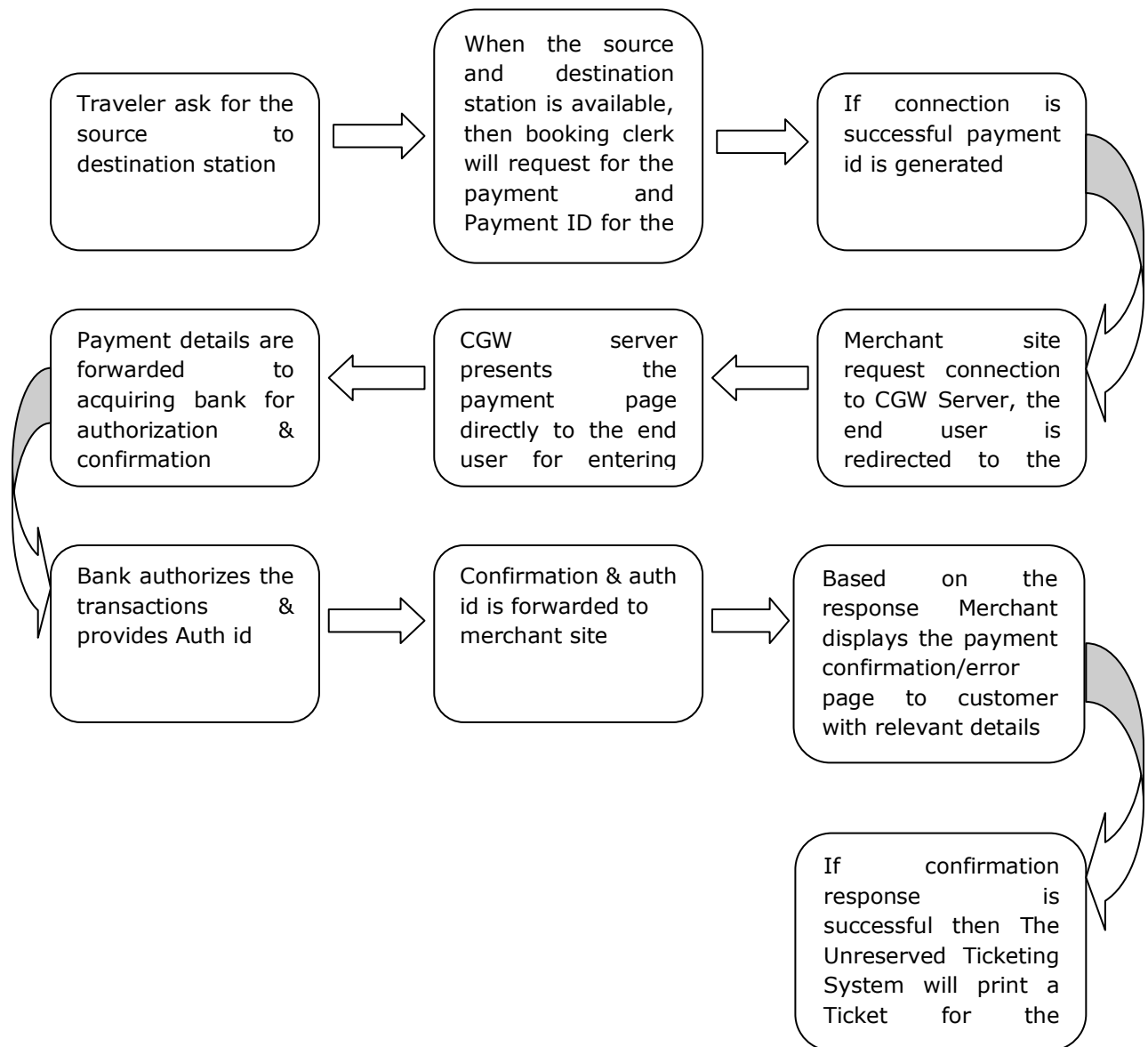
Figure 4.2

The credit/debit card can also be used at the time of ticketing from any of railways network, there must be swap machine attached with the Ticketing Client/Ticketing Remote Machine, Again there is a possibility of the theft or unauthorized use of the credit cards or even the debit cards, there are two solution to the problems:

- a) There must be a PIN entry at the time of ticketing
- b) There must be a registered mobile number to the every Credit/Debit Card and the generated ticket will be sent to the registered mobile number only, if at the time of ticketing the system fails to send SMS to the registered mobile number or even the mobile number is not working the transaction should not complete.

The working model of the Electronic card

### Transaction Flow



#### IV. Pre-requisites (Hardware/Software)

Below are the hardware/software requirements. Merchant should confirm that he is having all the desired requirements to go further for Integration

- Operating System: Windows 2000/ 2003 Server
- Web/Application Server: Any Web/Application Server that supports ASP, most current version with all required patches
- Plug-in files from Bank
- The server should have a Public IP(LIVE)
- If Merchant is using SSL, it should be valid SSL. Response will not be received by merchant if its trial SSL
- Port 80 & 443 must be enabled for Payment Gateway transactions

- Merchant should not try to do any modifications in plug-ins provided for integration
- Resource file (resource.cgn), alias name etc (Provided by FSS)
- A ZIP file from FSS (containing classes & other required files)

#### V. Conclusion

There are several reasons for transport authorities for introducing electronic ticketing systems. However, they do not have the same priorities to all of them. Hereafter a list of expectations compiled from the study:

- Prevention of fraud
- Fare flexibility
- Improved multi-modal and multi-operator integration especially where method of operation requires accurate allocation of fares to private operators.
- Reduction or elimination of survey costs
- Speed of passenger throughput – though this varies by mode
- Improved passenger convenience and ease of use
- Efficiency savings
- Ability to pay for other services with the same card
- Improved information for transport planning
- Improved image for public transport

Although it is a very topical subject, contactless ticketing is still in an early stage of development. If we except few projects (mainly in Asia, in Finland) which have been implemented in the 1990's, the most significant and large scale development are taking place presently such as in London and Paris or are at trial or feasibility stage such as in Barcelona, Bilbao, Vilnius, the Netherlands, Denmark, etc. Thus, it is still early for a global assessment of the cost-benefit implication or the business case of e-ticketing. Nevertheless, it is possible to draw some conclusions on specific issues from these various projects Only some aspects:

- The effective closure of the fare collection system (i.e. 'check in – check out') afforded by new fare collection systems has increased the practicality of distance-based pricing. While a number of economic arguments can be made to support a distance-based fare structure, the equity argument is probably the strongest.
- Although some examples can be identified where new fare collection equipment has facilitated a migration to distance-based fares (e.g. Seoul Metro), there is no dominant trend from a fare structure perspective.
- More generally, a number of cities have either retained or simplified their fare structures rather than embrace the full capabilities offered by contactless smart card fare collection systems.
- The expected termination of the traditional fare product concept with the introduction of contactless smart cards has not been matched by the reality. While e-cash is now extremely important in some systems, it often sits alongside traditional product concepts. In some cases this has required the on-going parallel operation of existing fare media and fare collection systems. There are a number of drivers of this outcome:
  - Desire to retain products that are popular and well understood
  - Regions served by multiple operators and fare collection systems (i.e. lowest common denominator)
  - Requirement to support visitors and infrequent users
  - Political imperative not to impose fare increases on the market via fare system reform
- Most transport authorities that have chosen to introduce electronic ticketing have done so cautiously. Generally the launch of a system follows an extensive trial period, during which the system is only partly operational and available only to a small proportion of its eventual users, such as staff or those eligible for concessionary passes. Despite the understandable caution of all transport authorities that have chosen to introduce electronic ticketing, no major problems have occurred to date. Later schemes should be able to benefit from lessons learned in areas where electronic ticketing has already been introduced and from improvements to equipment made in hindsight of this experience.
- Referring to standards when defining e-ticketing specifications offer several advantages in terms of sustainability of systems, modularity of its components, interoperability of systems, provision of information to travelers, cost saving, etc. However, these benefits will be lesser when technological evolution will imply to replace equipments or some part of them.

- With e-ticketing, it becomes much more straightforward to provide multi-modal and multi-operator tickets that can be used for travel on any element of a public transport network. However, it is in places where public transport is less well integrated that this aspect of electronic ticketing could offer the greatest benefit.
- Electronic ticketing can assist authority in improving clearing mechanisms by providing detailed information on customer's mobility behavior. If a check-in/check-out procedure is implemented, it becomes easy to distribute revenues according to the actual travel pattern. A direct impact is a saving on the cost of surveys which are periodically carried out to estimate how the different public transport networks are used.
- through mining the e-ticketing-related data, it becomes possible to get the network performance statistics. Mining on the public transport data collected provides valuable information on bus, rail, cards usage and travel patterns, which then could be utilized for policy, planning and marketing usages. This information will be more complete in a check-in/check-out system.
- New possibilities offered by NFC and bank-issued smart cards opens up new horizons (mobile-ticketing, bank card ticketing)

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