

ARTM: The Future of Railway Ticket Counter

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Abstract

Smart cards are now a days being used in many fields for identification, authentication, and data storage purpose. This paper is mainly concerned on utilities of smart cards in procuring railway tickets. Looking at the history, when the first railway opened, tickets were simply slips of paper with all the details written in by hand. Then, a more efficient system that consisted of small pieces of card, each pre printed with the entire journey details and stored in racks. Then, to speed up ticket issue would be to have a ticket machine in the counter. Tickets would be printed on demand and so reduce the number of tickets held in stock. But, "There is always a great rush at ticket counters. Whether local or long distance trains, the queue is maximum for unreserved tickets. In such traffic conditions, there exists a problem that clerks must be assigned at ticket windows at all times, thus resulting in an increase in labor cost". With these two issues in mind, it is the primary object of the present invention to provide an automatic ticket vending machine that will available railway tickets in public space such as shopping center/malls, airports, grocery stores, petrol/gas filling stations, restaurants, or any other place where large number of people may gather. The move is aimed at reducing the rush at ticket counters. To encourage usage of ticket machines and reduce the need for salespersons, machine prices may in some cases be lower than those at a ticket counter. This new idea invented automatic railway ticket machine.

Introduction

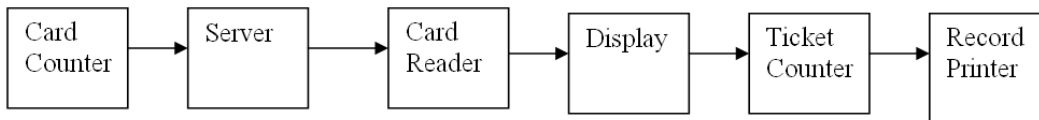
A ticket machine is a vending machine that produces tickets. The ARTM smart card will be issued through the card counter may be located at railway station or some other places. Each smart card will have some amount. ARTM smart card will have a magnetic strip or a chip, which contains a unique card number. For security purpose user can use a password to access the ARTM. The ARTM will be equipped with a

touch-screen system where a passenger has to feed information like destination, date, time, number of tickets to be purchased, adult or children etc. ticket are printed and dispensed to the user. We can have one additional display in the ARTM room for table of trains connecting the desired stations and it will be appear on the display as soon as we will enter the Arrival and Departure stations.

A server will maintain all the record of ARTM card and user information. ARTMs will be connected to the server via lease lines. The advantages of automatic ticket vending machine is that, it is economic, user friendly, reliable and can be easily accessed by disabled people.

How to Work?

Functional Block Diagram of ARTM



Card Counter

The ARTM card will be issue through the card counter may be located at railway station. Each smart card will have some amount. ARTM smart card will have a magnetic strip or a chip, which contains a unique card number. For security purpose user can be use a password to access the ARTM. Whenever we will purchase ticket by the ARTM card, the amount will be deducted from the total amount. But when total amount will be finished the card can be recharged like GSM SIM card or user can purchase another card.

Server

Server is use to maintain the record of ARTM card and user information. There are two ways to organize the functionality of ARTM server,

- Online server
- Offline server

These server will be use to store the database of the stations and also user information. The online server is used to maintain the information about the ARTM Card user like ATM in banking sector and also about the schedule of the trains connecting various stations. And the offline server may be used to maintain the information about the schedule of the trains only there is no need of user information so that one can purchase the variable amount ARTM card available at various shops and with the help of these card the user can get the ticket from the ARTM machine by inserting this card into card reader. These types of ARTM cards are only for use and through if the balance is nil. Normally offline server may be used in metro cities so that one can get local tram ticket for short journey like Mumbai, Delhi etc. And it may also be used for getting local ticket of passenger trains for long journey where there is

no need to specify birth number. While online server is used to obtain any kind of train ticket whether it may be a local or reservation ticket.

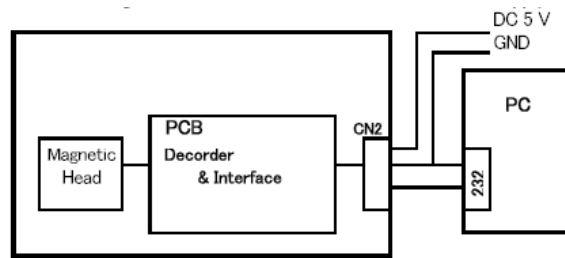
Card Reader

This specification describes manual half insertion type magnetic card reader with built in RS232 interface and decoder on single board. The information of the user saved in database is matched with the information stored in the card as soon as the user inserts the card into card reader, which is connected to the server with the help of RS232 interface.

Pin No. & Signal Name

Pin No.	RS232 Signal Name	Connection to external Equipment
5	DC 5V	DC Power Supply
4	DC 5V	
3	TX	PC
2	RX	PC
1	GND	DC Power Supply & PC

Magnetic Card Reader Power supply



Circuit of Magnetic Card Reader

Display

The screen of the ARTM machine on which we can feed all the information regarding date, time and the arrival and departure stations. We can have one additional display in the ARTM room for Table of trains connecting the desired stations and it will be appear on the display as soon as we will enter the Arrival and Departure stations. The display may be touch screen or manual. Both the display will be connected to CPU with the help of RS-232 interface or any other interface approved by EIA.

Ticket Counter

When the user complete all the formalities regarding the source and destination station with the required information about the train, the ticket counter will issue ticket through the record printer and amount will be deduct from the balance of the card. In case of no journey user can canceled the ticket with the help of ARTM

Machine for these user has to provide the information of the ticket but is should be before the journey.

Record Printer

Record printer is use to provide the ticket of the journey, information about the balance and also the information about the previous traction of the user.

Suggested Algorithm

- You can choose English language clicking on English.
- Now enter the user information like your password etc.
- Now, on the screen, you click the button File and electronic tickets collection
- A new screen appears with the description of the ticket(s).
- Now you click the button: Collect the chosen journeys
- It's OK now. You can take your tickets

Conclusion and Future Enhancement

To encourage usage of ticket machines and reduce the need for salespersons, machine prices may in some cases be lower than those at a ticket counter. In many countries where trains and urban transport tickets operate largely on the honor system (with enforcement by roving inspectors or conductors), there are also machines in stations (or in vehicles) just for validating tickets. This is for the situation where one buys a ticket in advance, and then decides to use it later. Usually the ticket is time stamped to determine its validity period. A common problem is forgetting to validate and then being fined as if one had no ticket at all.

Reference

- [1] Automated Transaction Machine, US patent 6,945,457.
- [2] Brain, Marshall Marshall Brain's More How Stuff Works, John Wiley and Sons Ltd, New York, October 2002, ISBN 0-7645-6711-X.
- [3] Reference from Shenzhen World Bridge Electronics CO.,LTD.
- [4] Reference from WBE regarding annual Swipe Magnetic Stripe Card Reader.