

Biometric Based Automatic Ticket Vending Machine for Indian Railways

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Abstract – This paper deals with the new model of Automatic Ticket Vending Machine (ATVM) for Indian Railways which will make it smart and secure. The purpose of this project is to enable cashless payment through a biometric device. As each and every person has a unique fingerprint, we can store it in already existing ATVM database or we can link it to AADHAR card.

Key Words: AADHAR card, Fingerprint, Ticket Vending Machine

1. INTRODUCTION

India is the second largest country in terms of population and the Indian Railways is the biggest employer in India and also Indian Railways finds spot in top three for longest railway coverage. By looking at this we can say India have a huge amount of people travel by train.

We see a lot of people standing in a line to get a railway ticket and lot of time is spent to get a ticket especially in during weekends and festive time. As India is vastly cultured country we have many holidays and ticket counters are very rushed and getting a ticket is getting almost like a lottery ticket. As we know India is developing country and many people travel by train to their jobs.

1.1 Digital India and Smart India

In India, our Prime Minister is stressing for Digital India and Smart India movements where newer technologies and smart applications are encouraged. In India AADHAR Identification is a unique identification system where our biometrics such as fingerprints and retina scanned data is stored into the AADHAR database server. For every person, a unique identification number is allotted.

1.2 AADHAR

AADHAR Identification number can be used to make money transactions as the bank accounts are linked with the AADHAR ID. There is an AADHAR payment system called AADHAR pay by just using our fingerprint we make payments.

1.3 Biometric ATVM

In this prototype, we have developed a software where as a railway system administrator we can set train details and register new ATVM user. The payment will be done using our fingerprints. That is this system can be either linked with AADHAR ID or unique identification provided by the Indian Railways. The registered user can use this software to book tickets in quick time without worrying about hard cash, smart card, debit or credit card etc.

2. LITERATURE SURVEY

Many types of Ticket Vending Machines are being seen in recent years with software and hardware of different kinds.

In paper [1], the authors discuss about user centered design approach for self-serving ticket vending machine where context of use was analyzed, and conducted requirement analysis different hardware and software interaction designs were iteratively tested and evaluated with the help of 250 participants.

In paper [2], a new improved project for ticket ejecting module of TVM was proposed to overcome the defects of traditional method of vending tickets with frictional wheel, which hurts the cards easily with low control accuracy.

In paper [3], the authors proposed a smart card technology for payment of tickets and it was tested in Dublin.

3. METHODOLOGY

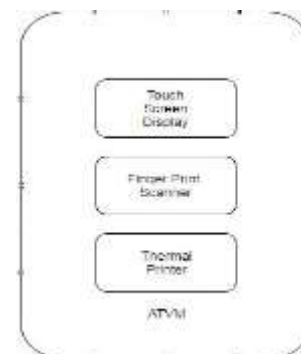


Fig -1: Proposed ATVM Model

In the Fig -1 we have a proposed ATVM model which consists of touch screen display, finger print scanner and thermal printer.

Here we need to login using unique identification number, it maybe AADHAR UID or Indian Railways UID depending on what database we take into use.

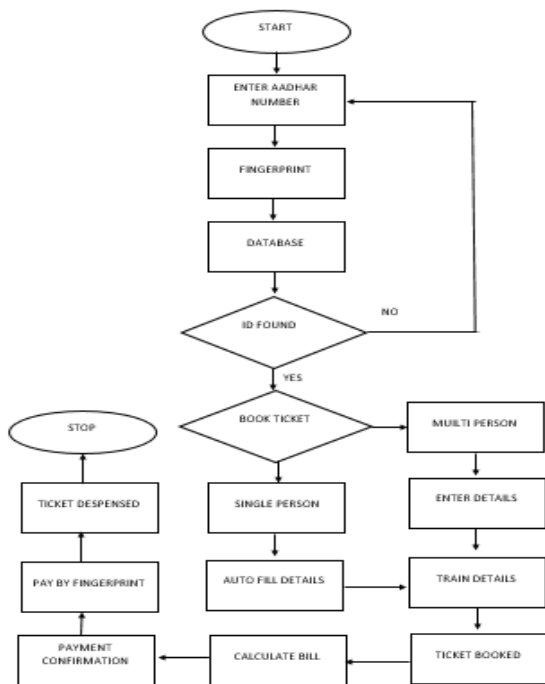


Fig -2: Flowchart for Proposed ATVM

The above Fig -2 represents the flowchart of the proposed ATVM. We can observe that the database used could be AADHAR UID or Indian Railway UID. Ticket can be quick booking or multi person booking. We confirm and pay for the ticket using our finger print. AADHAR UID is linked to our bank account the money transaction takes place through it. For Indian Railway UID we need to register and deposit advance amount into our account. By this cashless transaction could be made possible.

4. RESULTS

The software divides into administrator and passenger user interfaces respectively.

Administrator interface consists rain information, train fare, train seat availability, reports, register user.

Passenger user interface consists of single ticket which auto fills the details only train details have to be entered and in multiple booking we have enter the train details as well as of passengers.



Fig -3: Admin User Interface

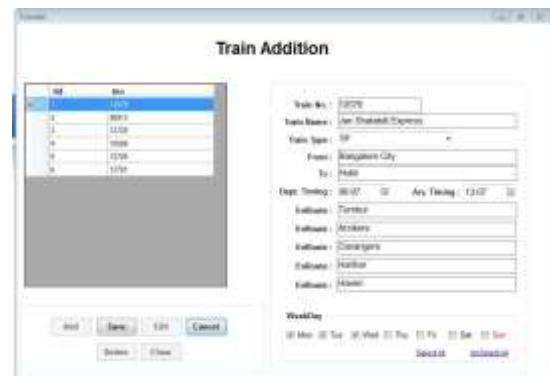


Fig -4: Train Addition



Fig -5: Train Fare



Fig -6: Seat Availability

Fig -7: User Registration form



Fig -11: User Login

Fig 8 -: Admin train reports

Fig -12: Single Ticket booking

Train Fare							
Train Number : 12079		Train Name :Jan Shatabdi Express					
Train Type : SF		From :Bangalore City		To : Hubli			
From City	To City	RMS	AC1	AC2	AC3	Sleeping Class	Car
Tumkur	Hubli	366	1,500	1,300	560	300	400
Aravikere Junction	Hubli	306	2,300	1,900	1,480	250	350
Davangere	Hubli	256	2,500	2,100	1,450	300	300
Haveri	Hubli	240	2,700	2,300	1,750	400	200
Hattar	Hubli	240	2,500	2,150	1,450	360	270
Rattihalli	Hubli	0	2,750	2,250	1,650	450	170
Tumkur	Aravikere Junction	150	0	0	0	220	100
Yewasepur Junction	Hubli	470	2,300	1,900	1,680	250	500
Bangalore City	Hubli	470	2,200	1,900	1,600	350	100

Fig -9: Train Fare List

List of Trains					
Train No	Train Name	Train Type	From	To	WeekDays
					M T W Th F S N
56513	Bangalore - Hubli Fast Passenger	Pass	Bangalore City	Hubli	Y N N N N N N
12726	Intercity Express	Exp	Dharwar	Bangalore City	Y N N N N N N
12079	Jan Shatabdi Express	SF	Bangalore City	Hubli	Y Y N N N N N
16388	Rani Chennamma	Exp	Bangalore City	Hubli	Y N N N N N N
12725	Siddhaganga Intercity Express	Exp	Bangalore City	Hubli	Y N N N N N N
12781	Swarna Jayanti	SF	Hubli	Mumbai Central	Y N N N N N N

Fig -10: List of Trains

IRCTC Ticket Confirmation						
Transaction ID : 1	PNR No: 102-1000025					
Train No/ Name : 12079 / Jan Shatabdi Express						
Date of Booking : 2-Aug-2017	Time of Booking : 22:59:20					
Class : Sitting Car	Quota : General					
Date of Journey : 02-Aug-2017						
From :Bangalore City	To:Hubli					
Boarding AT : Bangalore City	Date of Boarding : 02-Aug-2017					
Transaction ID : Hubli						
Departure Time : 06:07	No. of Psng : 1					
Passenger Details						
Srno	Name	Age	Gender	Status	Coach	Seat / Berth
1	HARISH K	25	M		S2	1
Fare Details						
Distance :	470 KM					
Ticket Fare :	Rs. 180.00					
Service Charges :	Rs. 00.00					
Insurance:	Rs. 00.00					
Total Fare :	Rs. 180.00					

Fig -13: Ticket for Single booking



Fig -14: Multiple Ticket booking



Fig -17: ticket cancellation confirmed



Fig -15: Ticket for Multiple booking

5. CONCLUSIONS

In this paper, we successfully present the prototype model for Biometric Based Automatic Ticket Vending Machine. With the help of finger prints we can make the payment as shown in the paper for better and secure cashless transaction for buying a ticket. This would lessen the amount of people standing in line and it will be smarter and secure method of payment option.

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Fig -16: Cancel ticket