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Automatic Ticket Vending Machine using Wireless Technology.

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Abstract: The present ticketing system used in our Indian railways is kind of out dated .the passengers have to stand in a long queue before getting their ticket for the journey. The passengers sometimes do not get their ticket due to not having change and thus they end up travailing without tickets and breaking the law. To reduce the crowd at the ticket counter the government came up with the ATVM machines at every station but the effort of the government to reduce the crowd went in vain, as the ATVM machines were not user friendly and many of the people were unable to use it due to that. Even after giving some offers the ATVM machine was not used by most of the customers, mostly uneducated people for this issue we have come up with the solution to use Bluetooth technology, RFID etc in ticket vending system. Now a day's all the people use their mobile phones and most of the people are aware about how to use the Bluetooth technology which is present in the mobile phones. so by making the use of Bluetooth technology in the present ATVM we can make the process of getting the ticket more easy and less time consuming. the advancement can also be made using the android platform available for free on the internet
Keywords: Ticket system, Bluetooth, Android, wireless, Automatic.

I. INTRODUCTION

The aim of this paper is to develop a more basic approach to railway ticketing systems. Mobile technology has come a long way for gsm to 4g technologies and today majority of people use cell phones as part of their everyday life. We intend to use Bluetooth technology already available in all the phones to enable commuters to buy railway tickets from their phones and get a e-ticket in their phone itself and thus reduce the time and hassle involved in getting a ticket through traditional methods The current touch screen based printed ticket ATVM systems are not very efficient because users have to stand in a queue to use the screen interface and also to get printed ticket, Bluetooth communication will enable us to pair with the ATVM machine up to certain range around the ATVM machine with no need for standing in a queue. Moreover Bluetooth shall enable us to use a high speed and data rate which is not present in technologies such as ZigBee. The RFID based ticketing system can also be used .

II. LITERATURE SURVEY

In an attempt to reduce serpentine queues at ticket counters in suburban railway stations, the Southern Railway (SR) has decided to sell tickets to even those who do not possess a smart card through the Automatic Ticket Vending Machines.

However, to buy tickets from machines, passengers need to buy a smart card by paying a minimum sum of money. While passengers who do not often commute by train found this as unnecessary expenditure and continued to throng the ticket counters, the regulars opted for season tickets. Hence, the ATVMs remained under-utilized. Although the touch screen machine can handle over 2,500 transactions per day, it records only an average of 273 transactions. Even incentive on fare on every top-up evoked poor response.

Now, with the twin objective of easing congestion in counters and to make the ATVMs popular, the SR has decided to appoint — personnel to man these counters. The authorities said retired railway employees from the commercial wing are likely to be appointed. They will swipe their own smartcards and issue tickets.

Various researches have been done on Railway Automatic Ticket Vending Machines. Marc Hassenzahl et al. examined on User Experience (UX) to be a strange phenomenon: readily adopted by the Human – Computer Interaction (HCI). HCI's main objective was to contribute to our quality of life by designing for pleasure rather than for absence of pain in the future.

Anthony Lo et al conducted a research on Machine-to-Machine (M2M) communications system which overcomes the drawbacks of traditional Human-to-Human (H2H) communication. But probably ended up with the decision that Human-to-Machine (H2M) communication to be more efficient when compared with the other two systems.

SB. Shriram et al analyzed the use of Automated Ticket Vending Machine by the people which made him discover that ATVM machines were not so successful in all the places where they have been implemented. He attempted to provide a feasible solution for

the problem of manual ticketing by the use of Radio frequency identification (RFID) tags. It requires each commuter to have a unique RFID tag for their identity.

III. PROPOSED MODEL

The proposed method tries to overcome the inconvenience and problems caused by existing touch-based ticket vending machines by utilization of the most basic and simple technology that is cell phones. This idea can replace existing touch screen based ATVM operation with a more user friendly approach also it will stream line the process of paying for a railway ticket because users no longer have to stand in a queue at the ATVM to individually use the machine and get printed ticket instead the just have to get within 10M range of Bluetooth and pair their device then select destination and pay for ticket from their balance and they will get a SMS based e-ticket on their phone itself.

We have collected all necessary information about the project and studied different sections after comparing with existing technologies. Our Product is certainly user friendly and saves a lot of time and hassle involved with traditional ATVM machines. Also the application of this system will help reduce ticketless travelling in the railways as many times people don't buy tickets for short distance journeys simply due to the hassle involved with standing in long queues or having spare change. Since we have based our project on existing ATVM machines and used only a few off the shelf parts it will not require a lot of money to implement this project on the existing ATVM network that the railways has already established. Implementation of such a project in a developing country like India where a large number of people use public transport like railways will be of great benefit to passengers and railway authority alike.

IV. COMPARISION OF THE SELECTED TOPIC WITH EXISTING MODEL

The Automatic Ticket Vending Machine that we are making works via Bluetooth and is controlled by an android application. The existing models use touch screen based ticketing kiosks operated using Smart Cards. The passengers can purchase and recharge Smart Cards from ticket counters. The Smart Card has to be placed on a slot in the ATVM and user has to select the route and destination using the touch screen. After confirming the details, the ticket is printed and delivered. Once the ticket is issued, charge is debited from the smart card. The interface and the enabling software include a graphic display of route maps as well as trilingual menu options. It is cashless, convenient and a service that is available round the clock. We aim to provide an android application controlled ATVM at a price much lower than the existing. So that it is cost efficient. The use of android application has never been done before and so its quality of operation and smoothness of execution is excellent.

V. DESCRIPTIONS

Our project aims at developing an Automatic Ticket Vending Machine which is controlled via android application with the help of Bluetooth. First of all, with the use of android mobile phone, the user has to create his account, so that his details will be stored on database of ATVM machines. This application have all the details like user's mobile number on which he will get the message, his name and other details if necessary. The Application will have the money stored in it and user can recharge his account by credit or debit card. In place of the smart card which is based on RFID we are using application using Bluetooth, Thus with this little modification the whole system of ATVM machine worked wirelessly application. The data from the android application is transferred into the ATVM through the Bluetooth HC-05.
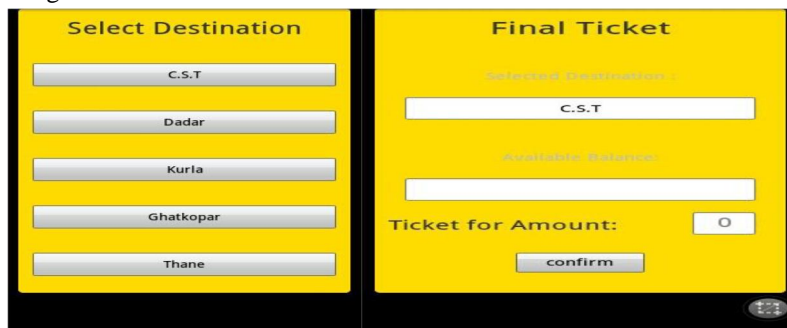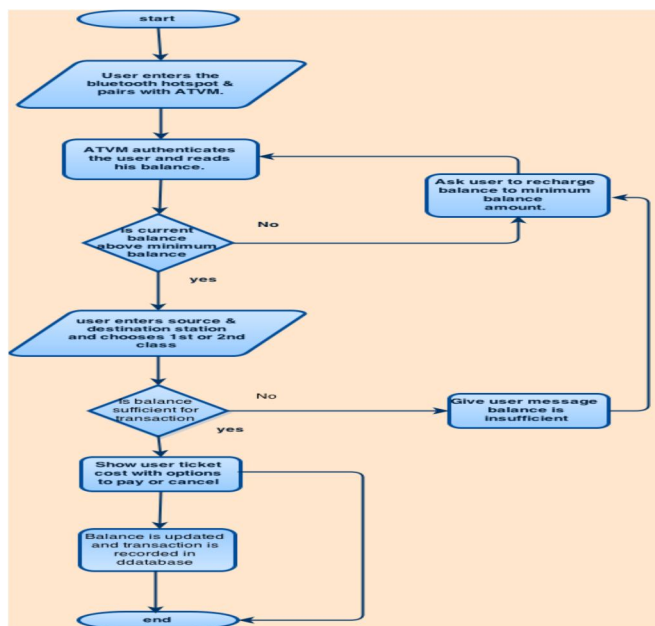

Fig1. Mobile Application Interface

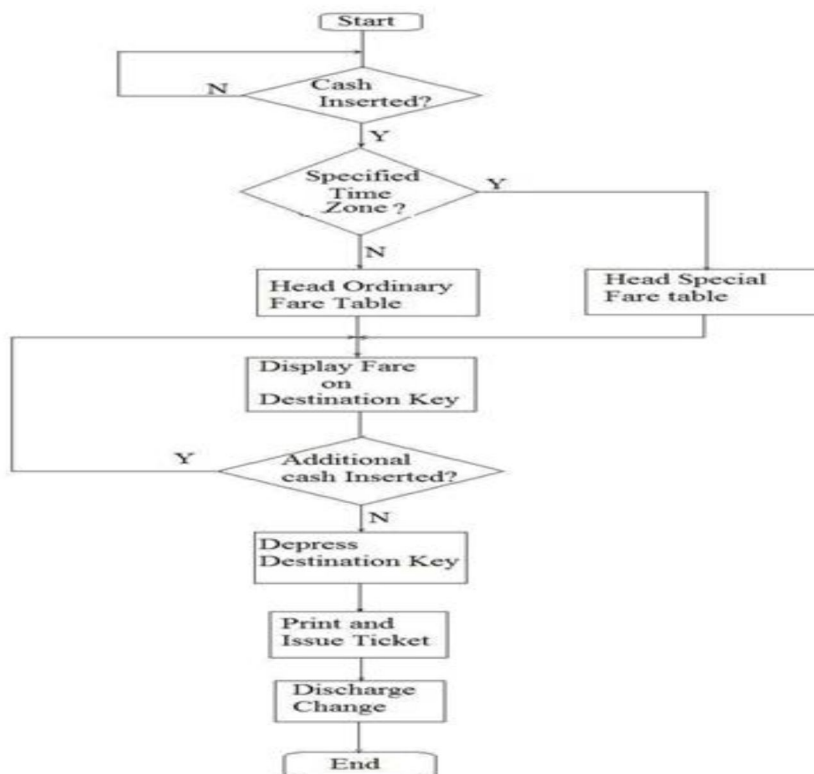We used another software in our project that is VISUAL BASIC 6.

A. Working Principal

The working principle of this project can be easily understood by the flow chart given below which shows the steps involved in getting a ticket from start to end. The main parts of the project are

1) The android application
2) The HC-05 Bluetooth module with PL2303 which enables the phone to communicate with the PC via Bluetooth.
3) The visual basic based software and the access based database for the transaction.
4) The GSM module to send the SMS based ticket.

B. Operation Of Control Section Of Atvm

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The CPU stands by until cash is inserted (in step n1).If cash is not inserted, then it will go back to start. When cash is inserted, CPU checks the current time zone (in step n2).

If the checked time zone is the ordinary time zone that is time zone related to that specific location, CPU reads railway fares from the ordinary fare table (in step n3) decided by the railway government.

If the checked time zone is the specified time zone belonging to that specific location of ticket buyer. CPU reads railway fares from the specific fare table (in step n4). These read fares are displayed on the destination keys (in step n5) within a predetermined railway section range corresponding to the inserted amount of cash.

However, when additional amount of cash is inserted, CPU returns from the step n6 to step n5. When a destination key 3 is depressed without inserting an additional key (in step n7), a railway ticket corresponding to a railway section determined by a depressed destination key 3 is printed and then issued (in step n8), and change is discharged or returned, where necessary (in step n9), to complete the control operation.

VI. FEATURES

A. Higher than expected uptake rates, and a more modern, efficient public transport system.
B. Reduction in the level of fraud through direct fare evasion or misuse of the wrong ticket.
C. Reduces the hassles faced by commuters
D. Reduction in paper consumption
E. The RFID tag does not need to make any electrical contact with reader
F. The RFID Tag is an active device which has a chip and antenna but does NOT need any power and are low cost.

VII. CONCLUSION

The paper tries to overcome the inconvenience and problems caused by existing touch-based ticket vending machines by utilization of the most basic and simple technology that is cell phones. This idea can replace existing touch screen based ATVM operation with a more user friendly approach also it will stream line the process of paying for a railway ticket because users no longer have to stand in a queue at the ATVM to individually use the machine and get printed ticket instead the just have to get within 10M range of Bluetooth and pair their device then select destination and pay for ticket from their balance and they will get a SMS based e-ticket on their phone itself. Also the application of this system will help reduce ticketless travelling in the railways as many times people don't buy tickets for short distance journeys simply due to the hassle involved with standing in long queues or having spare change. Since we have based our project on existing ATVM machines and used only a few off the shelf parts it will not require a lot of money to implement this project on the existing ATVM network that the railways has already established. Implementation of such a project in a developing country like India where a large number of people use public transport like railways will be of great benefit to passengers and railway authority alike.

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