International Journal of Advance Research in Science and Engineering
Volume No.07, Special Issue No.07, April 2018
www.ijarse.com
IJARSE
ISSN: 2319-8354

Implementation of Advanced Bus Ticketing System

Urvashi[1], Piyush Kumar[2], Yuvraj[3],

Sneha Chandana P[4], Nirmalkumar S Benni[5]

[1, 2, 3, 4, 5]*School of Electronics and Communication, REVA University, Bengaluru-560064 (India)*

ABSTRACT

Cities have been the beating heart of the nation's growth. With scale and speed of expansion the cities are turning into smart city and this astonishes people and allows them to live in it in a secure fashion with cities assets. Public transportation is people's primary mode and commuters travelling every day from one point to another loose lot of time and energy. This paper addresses the challenges the commuters face when travelling in public bus by allowing them to travel cashless. The system is set within the City standards and the results should allow everyone to travel safely, comfortably and with affordable price. The services are modernised with implementation of latest technology, RFID, the travelling depends on it and allows passengers to travel more freely. The credit transaction takes place at the end when the passenger reaches the destination and the system also allows the driver to have count on the number of passengers travelling. This project would be the attractive travel choice for everyone.

Keywords: RFID tags, RFID Technology, IR Sensor, GSM 800A, LCD, Arduino Uno ATmega328P.

I. INTRODUCTION

Mobility has become the essential part of human life. From the circumstances immemorial, everybody voyages either for sustenance or relaxation. A nearly related need is the vehicle of raw materials to an assembling unit or finished goods for utilization. Transportation assumes a noteworthy part in the improvement of the human development. For example, one could easily observe the solid relationship between the development of human settlement and the nearness of transport offices. Likewise, there is a solid connection between the nature of transport offices and way of life, on account of which society puts an awesome desire from the transportation facilities. As such, the answer for transportation issues must be diagnostically based, monetarily solid, socially sound, ecologically delicate, for all intents and purpose worthy and manageable. On the other hand, the transportation arrangement ought to be sheltered, quick, agreeable, advantageous, practical and eco-accommodating for commuters. In the silicon city Bangalore, the customary arrangement ofpublic transport is based on paper based that ultimately prompt turmoil among public,framework misfortune, corruption and above all the traffic jam which leads to huge wastage of time. What's more, having no administration expert to take control or keep an eye over the entire situation, the private divisions are making an imposing business model, taking controlover the general population

transport and despotic bring up in transport reasonable. The ticketing system using RFID can be made implemented to take care of the overarching issues. Despite the fact that the GPS based framework can be planned, we propose the RFID based tickets for its minimal effort, simple activity, compactness, toughness, unwavering quality and being considerably more easy to use. Likewise the rapid RFID labels and detectors make the following arrangement of a running transport just an easy breezy. Public carrying RFID based electronic tickets will approach any transport administration of the city. The information will straightforwardly be exchanged to the server fundamental database and the proportional credit will be put away in the respective transport account. This automated framework will spare time, have a higher legitimate investigation and lessen bedlam and perplexity on the road.Public transport is a greener form of travel where individual can easily afford to it where it is typically managed on a schedule, operated on established routes, and that charge a posted fee for each trip. Travelling in a public bus allows us to relax, read or nap during that commute instead of stressing and feeling the road rage. Despite of having such facilities there are half of the population who are choosing private over public transport. Definitely there are some strong drawbacks of using public transport such as poor customer services, delay, unreliability, quarrelling with conductor for trifle matter and many more which will be discussed and will propose a solution in this present study.

II. RELATED WORK

In traditional paper based ticketing, everyday tickets are beingprinted and sealed with the date manually by the bus conductor travelling in the bus. After finish travelling, the passengers usually throw away the used paper made tickets here & there which ultimately pollutes the environment. Trees are being cut as to make papers and the current system uses the paper based ticketing. Our proposed system uses the RFID tagged card carried out by the passengers and does everything automatically and eventually reduces the complexities faced by the commuters. Some benefits of RFID based ticketing framework over conventional system (both paper based tickets & magnetic tickets) are mentioned below:

2.1 Public Transport System, Ticketing system using RFID and ARM processor Perspective Mumbai bus facility B.E.S.T

Radio waves travel through most non –metallic materials, so they can be inserted in bundling or encased in defensive plastic for weatherproofing and more prominent sturdiness. Like smart tickets, RFID tickets are more difficult to duplicate than magnetic tickets, reducing the possibility of fraud. It achieves nearly 100% read rate, which would have track on ridership and doesn't allow travelling anyone with free fee. Unlike magnetic readers, RFID tickets do not have moving parts which reduces wear and tear and that makes RFID terminals significantly more reliable, and leads to a reduction of operation/maintenance-time ratios of more than 40%. The tags offer greater data-collection capabilities than magnetic. Smart tickets could combine a variety of different applications which enables the travel administrators to provide extra services and customer-loyalty schemes. The paper based construction and the reduced memory size greatly reduce the tickets price compared to a Smart Card and makes

migration of sectors of ticketing range onto a SMART platform economically feasible. Ease RFID tickets enable clients to change to a solitary innovation framework, and thusly diminish upkeep cost[1].

2.2 Vehicle Tracking and Ticketing System using RFID

Computerization is the key, however it comes nearby wrongdoing lessening, decreasing overabundance stocks and work in advance and diminishing the time taken from raw materials to finished item on the retailer's shelf ("time to market") and different advantage that straightforwardly affect cost. As a matter of fact, the RFID utilizes the low-end of the electromagnetic range. Thus waves coming from readers are not dangerous and are similar to those waves coming from our car radio. Similarly as our radio tunes into various recurrence to hear diverse channels, RFID tags and readers are tuned to the same frequency to communicate [2].

III. PROPOSED WORK

This paper proposed a method to provide the flexibility in operation of bus ticketing system by using RFID based tickets in place of paper tickets. We propose the RFID based tickets for its low cost, easy operation, portability, durability, reliability and being much more user friendly. Its high speed tags and detector make the tracking system faster and convenient.

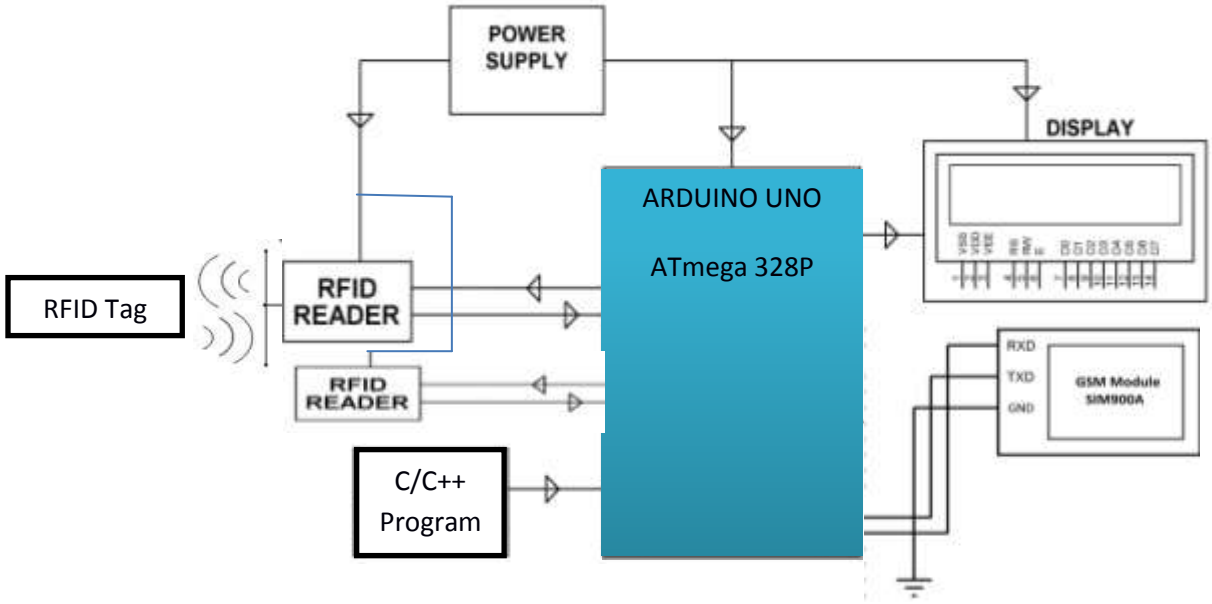

Fig. 1: Block Diagram

The figure represents the Block Diagram of the present model which consists of RFID reader, LCD, GSM module which is interfaced to the ArduinoUno 328p.

In this method each person will be provided with a RFID tag which will act as an electronic ticket and each RFID tag will have a unique id. Above Fig.1 represents the block diagram of the model. We are using two RFID readers in each system one will be used as entry reader and the other one as exit reader and this RFID readers are connected to an LCD which is used to display the information about the user and regarding the money deduction. And in turn this LCD will be interfaced to an Arduino. When a person will place his RFID tag in front of RFID reader a message will be displayed on LCD screen as '"Welcome 1" and when a person destination will arrive, while getting down from exit door again one more RFID reader will be there which is an exit RFID reader,where passenger has to place his RFID tag in front of RFID reader which will automatically deduct the money from passenger's account according to the distance. We have even added the counter to give driver an idea on number of passengers are travelling in the bus. As the person scans card the sensor notes it and counter counts it. The sensors are placed in the two places one at the entry and other at the exit. We are interfacing this hardware to the GSM 800A which sends the message to the respective passenger regarding their travel status. RFID tickets are very difficult to duplicate than magnetic tickets, reducing the possibility of fraud.

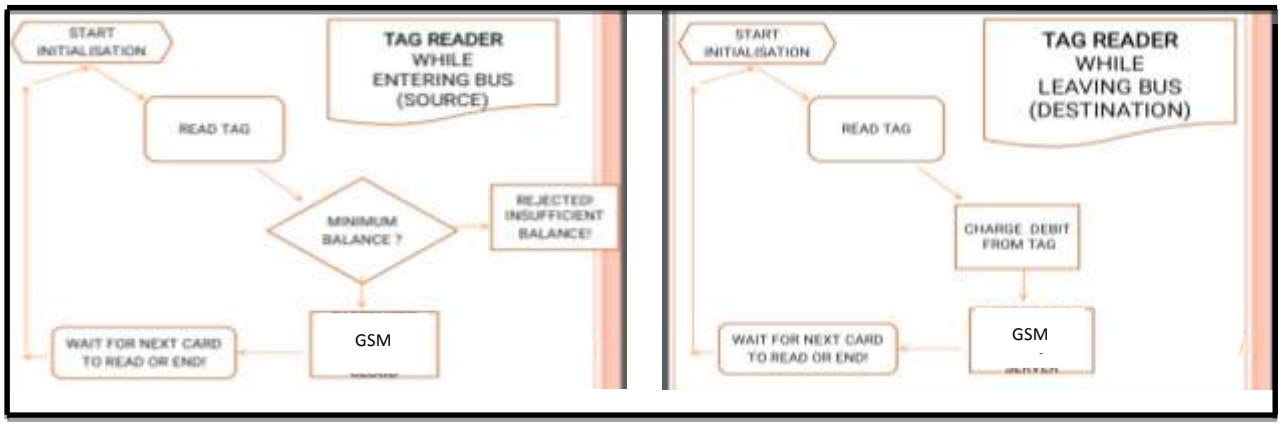

Fig. 2: Flow Chart

The above figure represents the flow chart of the framework at the Entry and Exit level

IV. RESULT

4.1 Setting up hardware

The hardware uses different components as shown in Fig. 3. Atmel ATmega 328P is a heart of the hardware which is used to interface with every other component. LCD 16x2 used to display the information on the ongoing event. Radio Frequency Identification (RFID) uses electromagnetic fields to automatically identify and track tags attached to objects. The tags contain electronically stored information. Voltage divider is a passive linear circuit that produces and output voltage that is a fraction of its input voltage. Infrared Sensor(IR) is used to detect the count of

the passenger travelling in a bus. A family of 8051 microcontroller is programmed to receive an input form the sensor and give a count of the passengers on the LCD screen.

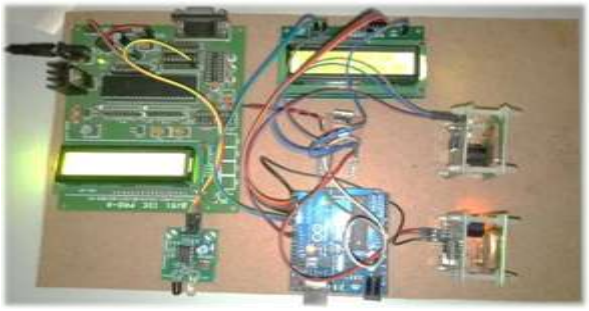

Fig. 3: Hardware Set up

The above figure depicts the overview of hardware setup.

4.2 Working of hardware

4.2.1 Scanning of Bus Ticket (RFID tag) in front of RFID reader 1:

"Welcome 1" will be displayed on LCD when a passenger enters the bus and scan in front of RFID reader as shown in Fig.4.

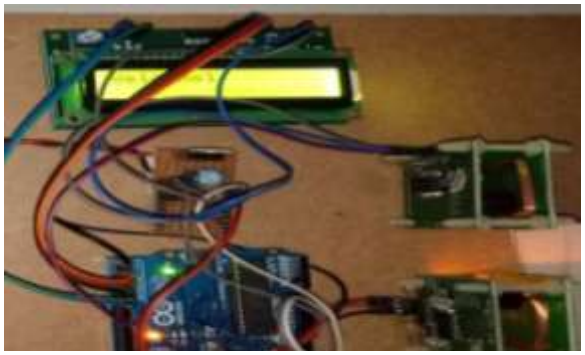

Fig. 4: RFID Reader 1

The above figure shows the Scanning to RFID Reader 1

4.2.2 Counting number of passengers (At Entry):

With the help of IR sensor the counter starts incrementing as passengers entered the bus, which will be displayed on LCD with the help of 8051 microcontroller as shown in Fig. 5 and Fig. 6.

Fig. 5: IR Sensor Scanner

The above figure shows the IR Sensor scanning

4.2.3 Scanning of Bus Ticket (RFID tag) in front of RFID reader 2:

"Amt. Deduct = 10" and "Balance Amt. = __" would be displayed when the card is scanned at the RFID reader 2. This is done at the point when passenger has reached his/her destination as shown in Fig. 7.

Fig. 6: Counter Incrementing

The above figure shows the increment in Counter

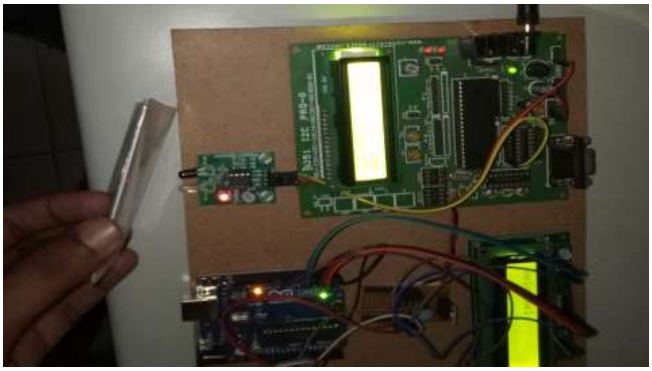

Fig. 7: RFID Reader 2

The above figure depicts the Scanning of card at exit level to RFID reader 2

4.2.4 Counting number of passengers (At Exit):

With the help of IR sensor the counter starts decrementing as passengers get down from the bus, which will be displayed on LCD with the help of 8051 microcontroller as shown in Fig. 8.

Fig. 8: Counter Decrementing

The above figure shows the decrement in counter

As the public transportation is the primary mode of transportation, commuters traveling everyday loses lot of time and energy. The existing ticketing system is facing more problems and with the simple technology of our project model it overcomes those problems and help commuters more freely. The framework is set within city limits and provides the commuters to travel them in cashless way. Our project uses a RFID tag which is pre-planned and that provides flexibility in operation. Our project is completed with better innovation which is more desirable and economical. The "**Implementation of Advanced Bus Ticketing System**" is designed to make the commuter's

journey and conductor's work more economical.This project on implementation would be the attractive travel choice for everyone. The work can be carried to the next level which could be more advanced and more travel friendly.

REFERENCES

[1]SunithaNandhini.A, Sangeetha.G, VidhyaJanani.J, "*Automatic bus fare collection system using RFID*",International Journal of Advanced Research in Computer Engineering & Technology (IJARCET) *Volume 6, Issue 3, ISSN: 2278 – 1323*, March 2017.

[2] Suresh Sankarananrayanan and Paul Hamilton, "*Mobile Enabled Bus Tracking and Ticketing System*", 2nd International Conference on Information and Communication Technology (ICoICT), IEEE, 2014.

[3] Md. FoisalMahedi Hasan, Golam Tangim, Md. Kafiul Islam, Md. RezwanualHaqueKhandokar and ArifUlALam, "*RFID-based Ticketing for Public System: Perspective Megacity Dhaka*",Computer Science and Information Technology (ICCSIT), 3rd IEEE International Conference , 2010.

[4]Bo Yan and Danyu Lee, "*Design of Sight Spot Ticket Management System Based on RFID*", *pp.496-499*, Internation Conference on Network Security, Wireless Communications and Trusted Computing 2009.

[5]http://rfid.bemrosebooth.com/benefits_of_rfid_tickets.php.

[6]"*Vehicle Tracking and Ticketing System (VTTS) Using RFID*"http://www.slideshare.net/computercriminals/complete-rfidproject document-i-presentation.

[7] Bernard Menezesl, Kamlesh Laddhad and Karthik B, KReSIT, "*Challenges in RFID Deployment –A case Study in Public Transportation*"http://www.it.iitb.ac.in/~kamlesh/Page/Reports/iceg06.pdf.