Journal of Theoretical and Applied Information Technology
15th April 2012. Vol. 38 No.1

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

PUBLIC TRANSPORT TICKETING AND MONITORING SYSTEM

[1]V.VENKATAKRISHNAN, [2]R.SEETHALAKSHMI
[1]School Of Computing, SASTRA University, Thanjavur, Tamil Nadu, India
[2] Professor, School Of Computing, SASTRA University, Thanjavur, Tamil Nadu, India E-mail:
E-mail: venkatv89@gmail.com, rseetha_in@yahoo.co.in

ABSTRACT

Controlling the traffic is one of the important and the major issues. The purpose of the paper is to develop a public transportation system using GPS, GSM, RFID and Zigbee which acts as user friendly to the user. The entire network comprises of three modules; Base Station Module, In-Bus Modules and Bus Stop Module. The base station module consists of monitoring system which includes GSM and a PC. The In-Bus Modules consists of two Microcontrollers, GSM Modem, GPS, Zigbee, RFID, LCD and infrared sensor. RFID for ticketing purpose, GSM, GPS is used for mobile data transmission and tracking location. The Zigbee module is also interfaced with the microcontroller which is used to send the bus information to bus stop and to get the information from the bus stop to bus. The Bus Stop Module is fixed at every bus stop consists of zigbee node which is interfaced with the Microcontroller. The public transport service can be effectively implemented by deploying the concept of this paper and quality of the service can be improved.

Keywords: *RFID, Ticketing, GPS, Zigbee, GSM.*

1. INTRODUCTION

The public transportation plays a very important role in day to day life. The main deterrent of using the public transport is uncertainty of waiting at bus stops, ticketing problems, due to traffic jam or any other issues the bus will get stuck, out of all these, the public people will be affected. This paper helps to overcome all these issues. The whole system is explained in the three modules. In the first phase, if the route is deviated or any problem in the route the driver gets the information from the base station through GSM and the vice versa the reply information is sent from the base station to the driver in the bus. If any passenger is in need of any information they can message to the base station and get the required information. The In-Bus module operates the RFID for ticketing purposes and IR sensor for counting the number of entering and exiting passengers. Today's transport management needs an integrity to approach the dynamic and uncertainty [3].In terms of safety , security ,efficiency, mobility , the research issues are undertaken to optimize the mobility of the people[3,4].Now a days the interest is going on developing the application about the RFID for managing the public Transport Systems[5,6]. Present system uses paper and pass based ticketing. In this proposed system we are implementing the concept of rfid and wireless technologies such as GSM,GPS and Zigbee. In this context RFID is used by removing the paper based ticket.

1.1System communication using GSM and GPS

Many researchers have proposed tele- monitoring system to trace the vehicle like ambulances and the other mobile moving objects [7].The fleet tracking system using GPS is proposed in [6] which gives the estimated time , the delivery date and time, the shipping on and the release date, finding the last location and the current location and in the some places the GPS is used in the public transportation using the detected communication networks.This paper deal with the stand alone structure equipped with the microcontroller interfaced with the GSM and the GPS based servers.

2. SYSTEM OVERVIEW

2.1 Bus Stop Module

This module contains one PIC microcontroller, LCD, Zigbee used for synchronization with bus , it

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

will continuously broadcast the request signal and wait for the reply signal for the provided request from the bus, if any bus available in that range it will synchronize with that by getting bus id and validate whether the bus having the halt here or not and shows he bus information like route , cost , bus

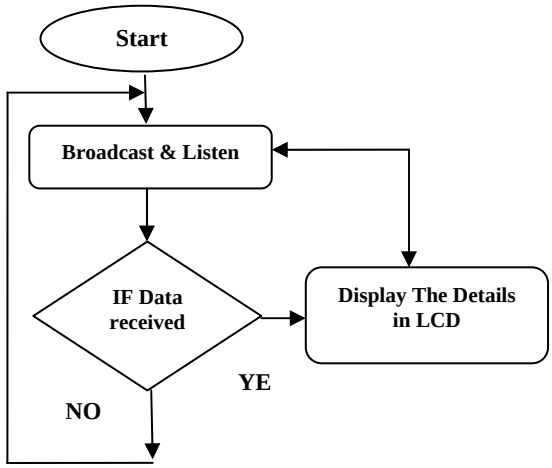

Figure 1.Bus Stop Module Flow Diagram.

type, bus name in the LCD in the bus stop and also sends bus stop details to the bus. Figure 1 shows the flow diagram of bus stop module.

2.2 In Bus Module

This module contains two PIC microcontrollers M1, M2. M1 interfaced with Zigbee, LCD, two control switches and two infrared sensors. M2 is interface with LCD, RFID, GSM, GPS and four control switches and one 8 key keypad. M1 controller will send bus details to bus stop after getting request from bus stop, after halting in the bus stop driver will open the door the counting will start, in this passengers will get into bus on front side and get out from back side, on both side sensors will count the passengers entering and exiting and counting stops after the door is closed.

The Zigbee and M1 are used to make synchronization with bus stop and get the bus stop details and display that in LCD. The control switches are used for door open and close purpose. M2 and RFID are used for ticketing purpose all the passengers having RFID Tag will show it and get their tickets registered. Generally the passengers can get monthly, weekly, one day passes passengers not having regular passes can get their ticket by giving money to conductor , conductor have the common pass for that. M2 with GSM, GPS are used for tracing the bus from the base station. The control switches are used for providing route details in case of any route diversions, the new route is provided to the bus driver and the other switch purpose is to inform any emergency situation in the bus to the base station.

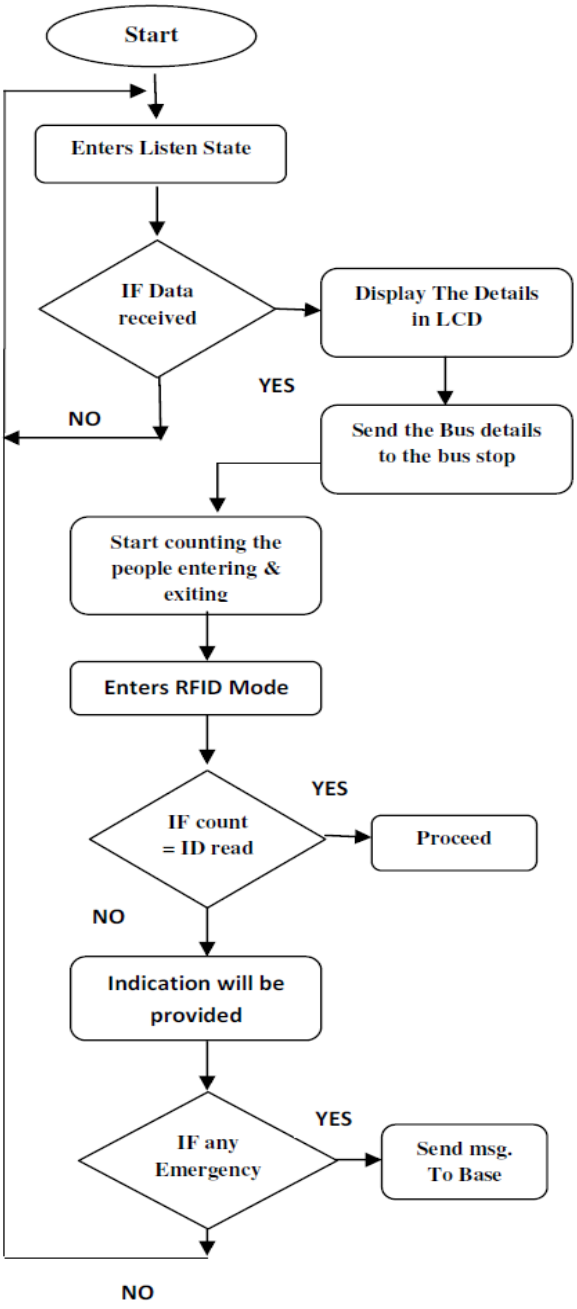

Figure 2.In Bus Module Flow Chart

2.3 Base-Station Module:

Journal of Theoretical and Applied Information Technology
15th April 2012. Vol. 38 No.1

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

This module contains a GSM interfaced with PC together known as coordinator system, used for tracking the bus and showing the route diversion request and emergency situations and also used to give the response for route diversions. The passengers can also give request for getting bus information using SMS. This module also maintains the database for maintaining the bus information and current status.

3. BLOCK DIAGRAM

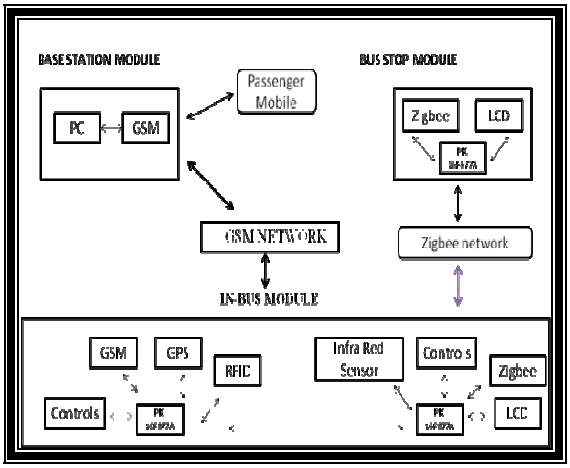

Figure 3. Block Diagram

Figure 3 shows the block diagram of the overall system. It consists of Bus stop module, In-Bus module, and Base station module.

4. RESULTS AND EXPERIMENTATIONS

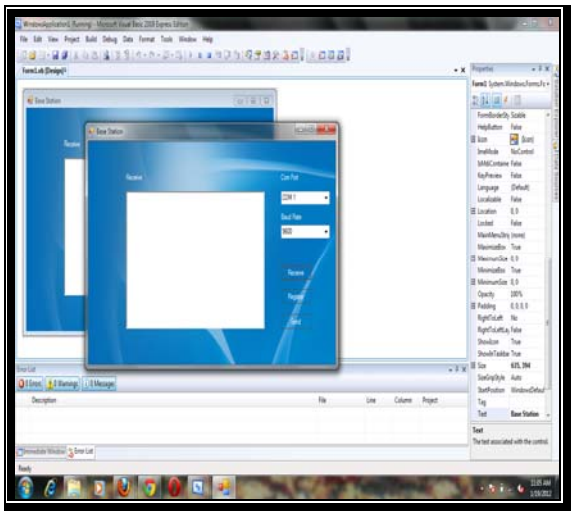

Figure 4: Screenshot of Base Access System

Figure 5,6 & 7 shows the prototypic circuitry of the system and Figure 4 shows the shot

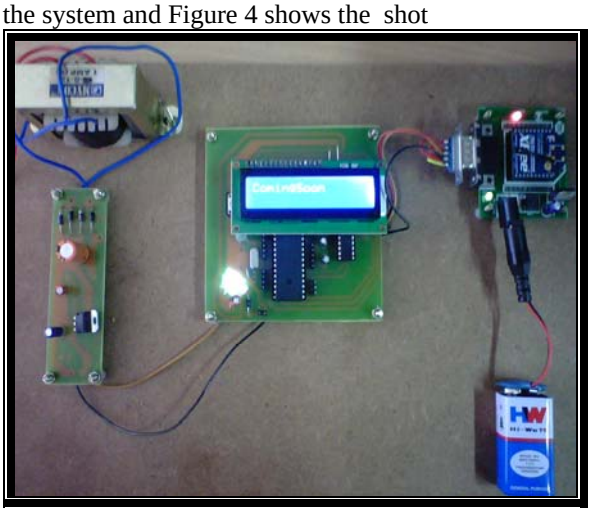

Figure 5: Bus Stop Module Circuitry.

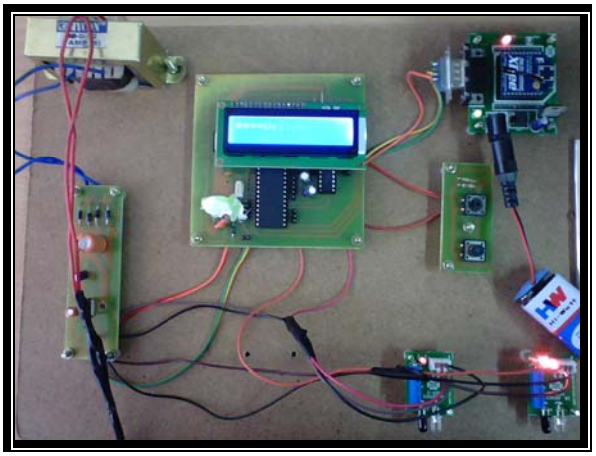

Figure 6: In-Bus module Circuitry

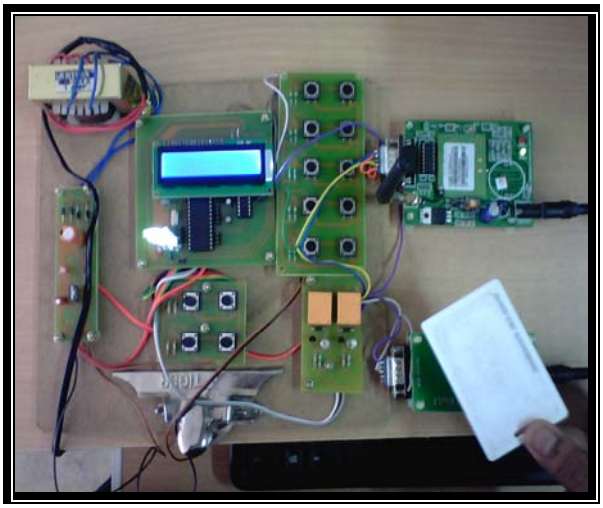

Figure 7: RFID Ticketing Module.

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

Screen shots of access form used in the base station, which contains number of user friendly fields.

CONCLUSION

Resources should be integrated and coordinated based on the RFID, GSM in the transportation medium which can easily meet the requirement of the public and can meet their emergency and the requirement of the public. GSM-Based Mobile Tele-Monitoring and Management System for Inter-Cities Public Transportations is proposed in this paper. The system takes advantage of wireless technology in providing powerful management transportation engine. The use of GSM and GPS technologies allows the system to track vehicle and provides the most up-to-date information about ongoing trips. On the whole this system proves to be very successful and can be easily implemented in real time. The experimentation result shows that the system is very efficient and cost effective.

ACKNOWLEDGEMENT

Author wish to acknowledge Dr.P.Swaminathan Dean School of computing and TIFAC-CORE laboratory SASTRA UNIVERSITY, for the time and support.

REFERENCES

[1] Umar Farooq, Tanveer ul Haq, *Senior Member IEEE*, Muhammad Amar, Muhammad Usman Asad, Asim Iqbal." GPS-GSM Integration for Enhancing Public Transportation Management Services ".© IEEE 2010.

[2] Md. Foisal Mahedi Hasan, Golam Tangim, Md. Kafiul Islam, Md. Rezwanul Haque Khandokar, ArifUl. "RFID-based Ticketing for Public Transport System: Perspective Megacity Dhaka
Alam"©IEEE 2010.

[3] V. Marchau, W. Walkera and R. van Duin. *An adaptive approach to implementing innovative urban transportsolutions.* Transport Policy, Volume 15, Issue 6, November 2008, Pages 405-412.

[4] RTD Working Group of the eSafety Forum, *Strategic Research Agenda ICT for Mobility – update 2007/08.*

[5] OECD, *Implementing Sustainable Urban Travel Policies –National Reviews*, ECMT (European Conference of Ministers of Transport), 2003, Paris.

[6] A. Aguiar, F. Nunes, M. Silva, D. Elias, *Personal Navigator for a Public Transport System using RFID Ticketing*,InMotion '09: Pervasive Technologies for Improved Mobility and Transportation Conference, Japan 2009.

[7] M. Mudigondal, A. Ramani, V. Subramanian, Applications of RFiD in Public Transport Sygtem to Aid the Visually Challenged, IEEE Indicon, Conference, December 2005Chennai (India),