



ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 11, November 2016

A Review on Smart Bus Pass Using RFID Card System for Regular Bus Passengers

Prof. Shilpa Khedkar, Praphull Powar, Pratik Gurdhalkar, Saurabh Karbhajan

Assistant Professor, Dept. of Computer Engineering, M.E.S College of Engineering, Pune, India

UG Student, Dept. of Computer Engineering, M.E.S College of Engineering, Pune, India

UG Student, Dept. of Computer Engineering, M.E.S College of Engineering, Pune, India

UG Student, Dept. of Computer Engineering, M.E.S College of Engineering, Pune, India

ABSTRACT: Bus pass is used by regular bus passengers to make frequent intercity travel trips at profitable costs as compared to daily bus fares. In existing system, user's bus pass registration and authentication is done manually with no computerized user details record saved. It is important that the information like user details, documents verification related details, records of user's travelling details should be stored at some secure location so that it can be reused whenever required. Our strategy involves design, development and building a smart card authentication system for bus passengers that scans user related details from RFID tag and match the details with the database and authenticate it. If the user is found authentic, then only it allows use of the pass otherwise it shows an error that card is invalid. This system will also help users in making better travelling decisions independently by providing timetable of all bus routes in the city through android application.

KEYWORDS: Android, LCD, Microcontroller, RFID.

I. INTRODUCTION

Radio frequency identification technology (RFID) is an automatic identification technology. Using this technology, identifying target and get relevant data information through radio frequency signal can be processed automatically. RFID system consists of antenna, RFID tag, RFID reader. The antenna emits radio signals to activate the tag and to read and write data to it. RFID tags listen for a radio waves sent by a RFID reader. When a RFID tag receives a query, it responds by transmitting its unique ID code and other data back to the reader. The RFID tags can be either passive or active. The reader emits radio waves in ranges of anywhere from one inch to 100 feet or more, depending upon its power output and the radio frequency used. When an RFID tag passes through the electromagnetic zone, it detects the reader's activation signal. The reader decodes the data encoded in the tag's integrated circuit and the data is passed to the host computer for processing. The most flexible auto-identification technology, tracking and monitoring of objects can be automatically done with accuracy using RFID. RFID is used in many real time applications like tracking of assets, management of supply chain and many other applications. Communication between the RFID system and the object uses frequency as a communication medium. RFID operates in three modes Low Frequency (LF), High Frequency (HF), Ultra High Frequency (UHF). Related to the frequency used in the RFID each mode has its own advantages and disadvantages. Commonly active RFID systems work in ultra-high frequency (UHF) band and ranges up to 100 m. The main purpose of this system is identification and authentication of users. The system will consist of a RFID (active) tags that carries information like user name, route information, validity of pass, etc. The user has to show this tag to the RFID reader, which is attached to the embedded device carried by bus conductor, which reads the information in the tag to authenticate the user.

II. RELATED WORK

In [1] authors developed a smart ration card using Radio Frequency Identification (RFID) technique to prevent the ration forgery as there are chances that the shopkeeper may sell the material to someone else and take the profit and put



International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 11, November 2016

some false amount in their records. In this system, a RFID tag was used that carries the family member details and the customer needs to show this tag to the RFID reader.

In [2] authors implemented a Bank locker security system using passive RFID and GSM. It was a low cost, low in power conception, compact in size and standalone system. The microcontroller was used that compares the passwords entered by keyboard and received through mobile phone.

In [3] authors used RFID technology to a sight spot ticket management system, and proposed a complex solution including design of electronic tickets, RFID data integration, hardware architecture, software design, data process and data security, for achieving the authentication of a large number of people, and enhance the efficiency of ticket checking.

The authors provided a brief survey on RFID applications and suggest some opportunities in intelligent RFID applications, in [4].

In [5] authors presented and analyzed the design and implementation of a microcontroller based home security system with GSM technology. Two microcontrollers with other peripheral devices which include Light Emitting Diode (LED), Liquid Crystal Display (LCD), Buzzer and Global System for Mobile Communication (GSM) Module were responsible for reliable operation of the proposed security system. In addition, a mobile phone was interfaced with microcontroller through a Bluetooth device in order to control the system.

In [6] authors considered the basic problem of collecting all tags in a large-scale system through a handheld RFID reader. A sensor network which uses wireless technology is proposed for monitoring of farm animals. This system provides the potential support from threats against missing animals from the farm and database security.

In [7] authors proposed a design that uses the second generation ID card as identification signs, and ZIGBEE as information collection mechanism. The combination of ZIGBEE technology and the second generation ID card satisfies the timeliness, safety and convenience requirements of the entrance guard system.

The designed system was used to provide complete solution for transport related problems such as accident alert, Vehicle surveillance in [8].

In [9] the system deals with the design & development of a theft control for an automobile, which was used to prevent or control the theft of a vehicle. The simulation of the circuit design and its implementation was done using PROTEUS software. This system was designed to improve vehicle security and accessibility. With the use of wireless technology vehicle owners were able to protect their automobiles with more passive involvement.

Paper [10] focused on study the important features of RFID applications, such as the hierarchy of containment relationships and path preserving in query operations. The authors proposed an expressive ER-model. Based on the ER-model, a simple yet efficient real-time tracking system for RFID data managements was developed.

In [11] authors presented a modernized method of examination hall management system. It was possible for a student to identify the particular exam hall from any other hall, when they swipe RFID card in a card reader located there. This was designed to helps them to identify the floor or get directions to their respective halls without delays. The card reader was provided at the entrance of the building, if the students enters wrongly a buzzer alarm sets off, otherwise the room number is displayed on the LCD, connected to controller.

In [12] authors developed a system that was combination of RFID and biometrics technologies to accomplish the required task. When the RFID reader installed at the entrance of hostel detects a number, the system captures the user image and scans the database for a match.

III. BACKGROUND

Bus pass is a ticket that allows a passenger of the service to make frequent intercity travel trips within a fixed period of time. There are different forms of pass like weekly pass, monthly pass, annual pass etc. Depending upon the need the user can select the type of pass. It includes user details, route information, validity of pass etc. The manual bus pass ID and monthly bus pass commonly used is shown in the figure (1) and figure (2) below.

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 11, November 2016



Figure 1: Pictorial representation of current bus pass ID

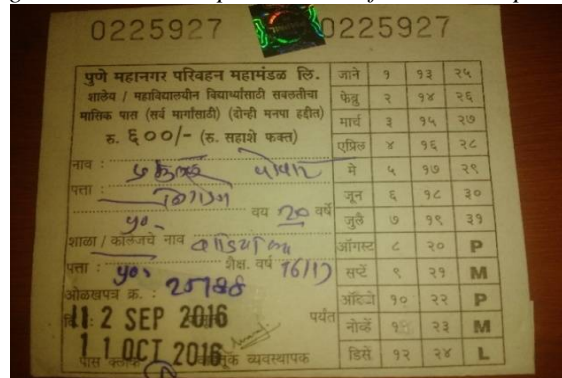


Figure 2: pictorial representation of current monthly bus pass

In existing system, a person may use another person's pass as there is no proof that the pass belongs to that particular person unless the bus conductor asks for ID proof. In RFID based smart card the photo will be printed on the card therefore the authentication is done easily. In this system we are going to develop a smart bus card system using RFID which removes the drawbacks of current bus pass system. Only authentic person is allowed to travel through the bus.

IV. PROPOSED WORK

A. BASIC ARCHITECTURE:

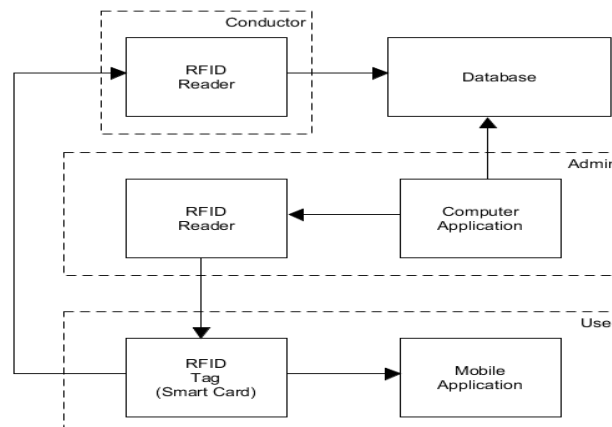


Figure 3: Basic Architecture of Smart bus pass System

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 11, November 2016

The basic architecture of Smart Bus Pass System is shown in figure 2. This system consist of 3 main parts are as follows

- 1) Admin
 - 2) User
 - 3) Conductor
- **Admin:** When user applies for the smart card to the Administration. Admin takes inputs from the user & writes the data in the active RFID tag. This active RFID tag then acts as SMART card.
 - **User:** While travelling the user must be carry the smart cart in order to avail all the benefits & privileges according to the pass type. User is also provides with the android application will guide the user by providing list of possible routes to reach the desired destination of user.
 - **Conductor:** Conductor is the part of this system which does the actual authentication of user details with the help of the RFID reader. He will be able to see all user details like name, address, user type, pass type, pass validity, phone no. etc.

B. SYSTEM FLOW DIAGRAM:

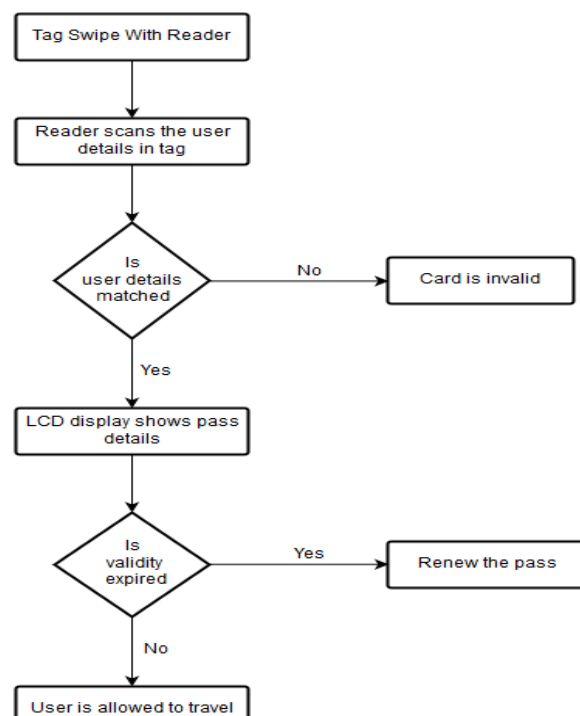


Figure 4: System Flow Diagram of Smart Bus Pass System

When active RFID tag is swapped with the reader, the reader reads the information from the tag. This user details are then matched with the database and if the information of the passenger is in the database, then the display system (LCD) will display the user details, pass validity details, user travelling details, etc. If the pass validity is not expired, then only user can avail the benefits of bus pass otherwise user is asked to renew his pass.



International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 11, November 2016

C. COMPARATIVE STUDY OF EXISTING AND PROPOSED SYSTEM:

Table (1) below show the comparison of the existing system with the proposed system. Hence, the proposed system will be easy to access and removes the drawback.

Table 1: Comparative study of existing and proposed system

Existing system	Proposed system
Bus pass of paper is used.	RFID tags will act as bus pass.
Manual entry with no user details record saved.	Computerized entry with user details will be saved in the database.
Authentication process handled manually.	Authentication process will be handled by RFID reader devices.

V. CONCLUSION AND FUTURE WORK

In this paper, RFID is going to be used to implement a Smart Card system for bus passengers. The main aim of the proposed system will authentication of information of the bus passengers. This system helps users by providing timetable of all bus routes in the city through android application for making better travelling decisions independently. We can provide GPS tracking of bus which will help users to track the current location and expected arrival time of bus using android application. Also in existing system, to renew the pass validity the user has to go the pass centre and stand in the queue every time to renew the pass which results in wastage of time. So we can design a system that allows users to renew the bus pass validity through android application using online transaction wallet from any place thereby saving time.

REFERENCES

1. Mohit Agarwal, Manish Sharma, Bhupendra Singh, Shantanu, "Smart Ration Card Using RFID and GSM Technique", 2014 5th International Conference- Confluence The Next Generation Information Technology Summit (Confluence).
2. R. Ramani, S. Selvaraju, S. Valarmathy, P. Niranjan, "Bank Locker security System Based on RFID and GSM Technology", International Journal of Computer Applications (IJCA) (0975 – 8887) Volume 57– No.18, November 2012.
3. B. Yan and D. Y. Lee, "Design of spot ticket management system based on RFID," in *Proc. International Conference on Networks Security, Wireless Communications and Trusted Computing*, 2009, pp. 496-499.
4. D. L. Wu, Wing W. Y. NG, D. S. Yeung, and H. L. Ding, "A brief survey on current RFID applications", in *Proc. International Conference on Machine Learning and Cybernetics*, Baoding, July 12-15, 2009, pp. 2330-2334.
5. Hasan, R., Khan, M.M., Ashek, A. and Rumpa, I.J. (2015) "Microcontroller Based Home Security System with GSM Technology", *Open Journal of Safety Science and Technology*, 5, 55-62. <http://dx.doi.org/10.4236/ojsst.2015.52007>
6. Mrs. V. Maria, Anu M.E, Deepika M.I, Mrs. L. Mary Gladance, "Animal identification and data management using RFID technology", 2015 International Conference on Innovation Information in Computing Technologies(ICICT), Chennai, India.
7. Xizhi Li , Yu Zhou , Changsheng Ai , Lijun Qian, "Smart Entrance Guard Control Based on RFID card and ZigBee Authorization", 2014 Sixth International Conference on Measuring Technology and Mechatronics Automation.
8. Kumar Chaturvedula. U. P, "RFID Based Embedded System for Vehicle Tracking and Prevention of Road Accidents", International Journal of Engineering Research & Technology (IJERT), Vol. 1 Issue 6, August– 2012, ISSN: 2278-0181.
9. Pravada P. Wankhade and Prof. S. O. Dahad, "Real Time Vehicle locking and Tracking System using GSM and GPS Technology-An Anti-theft System", International Journal of Technology and Engineering System (IJTES): Jan –March 2011- Vol. 2. No.3.
10. R. Wagner, N. Revell, and G. Pernul (Eds.): DEXA 2007, "Data Management in RFID Applications", LNCS 4653, pp. 434–444, 2007, Springer-Verlag Berlin Heidelberg 2007.
11. Parvathy A, Venkata Rohit Raj, Venumadhav, Manikanta, "RFID Based Exam Hall Maintenance System", IJCA Special Issue on "Artificial Intelligence Techniques - Novel Approaches & Practical Applications" AIT, 2011.
12. Umar Farooq, Mahmood ul Hasan, Muhammad Amar, Athar Hanif, and Muhammad Usman Asad, "RFID Based Security and Access Control System", *IACSIT International Journal of Engineering and Technology*, Vol. 6, No. 4, August 2014.