



Design and Implementation of Book Security System in Library Management Based On RFID Technology

Supriya C Kulbhaiyya¹, Prof. D.L.Bhuyar²

P.G.Student, Dept. of Electronics & Tele-communication, CSMSS, Aurangabad, India¹

Professor, Dept. of Electronics & Tele-communication, CSMSS, Aurangabad, India²

ABSTRACT: This paper describes about RFID stands for **Radio-Frequency Identification**. The acronym refers to small electronic devices that consist of a small chip and an antenna. The chip typically is capable of carrying 2,000 bytes of data or less. RFID devices will work within a few feet (up to 20 feet for high-frequency devices) of the scanner. RFID is a new generation which provides auto identification and data collection technique. RFID allows identification of tagged books, using radio frequency. RFID based Library Management System will help us to increase the flow of transaction for a library. in our daily lives due to their low cost and easy to use characteristics, RFID tags for a library management system to protect the books from unauthorized capturing and usage In the proposed method a book or a magazine or a CD is identified with the RFID tag. Whenever a book is issued to any user of the library, the RFID reader will capture the information of that books. a database of Number of books to be issued and returned and recording the information of the authorized student. RFID technology only use the tags to track items within their control, many of the benefits of RFID.

KEYWORDS:Radio Frequency Identification (RFID), Library Management System, Barcode, RF module, Fire sensor, Smoke sensor, cards, PC, GSM kit, RFID READER ,Tag, Theft detection.

I. INTRODUCTION

RFID (Radio Frequency Identification) is the latest technology to be used in library theft detection systems. Unlike EM (Electro-Mechanical) and RF (Radio Frequency) systems, which have been used in libraries for decades, RFID-based systems move beyond security to become tracking systems that combine security with more efficient tracking of materials throughout the library, including easier and faster charge and discharge, inventorying, and materials handling[1]. This paper presents a methodology of using low cost RFID tags for a library management system to protect the books from unauthorized capturing and usage.[2] Library management system is used to maintain the records related to number of books issued and the number of books returned to the library by the student, searching of books available in library, sending message on mobile to the student and regarding the due date of book to be returned and fine applicable, if the book is not returned on time to time by using the GSM technology and necessary requirements for the library to manage day to day operations taking place in the library[3]. Now-a-days, there are lots of colleges and Universities around the world and some of them consist of students up to thousands or more[4].

II. RELATED WORK

RFID in the library speeds up book borrowing, monitoring, books searching processes and thus frees staff to do more user-service tasks[1]. The Book Drops can be located anywhere, within or outside the library It is the most important link in any RFID system. It has the ability to store information relating to the specific item to Counter Station is a staff assisted station on services such as loan, return, tagging, sorting. This solution makes locating and identifying items on the shelves an easy task for librarians.[2]. The new designs like ARM11 are likely to replace the desktop PC's in near future as what is being done in above system and so as space being used by such bulky equipments making them more and more task specific[20].The methodology for implementation can be divided into many phases taking into

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 8, August 2016

consideration of budget provision, the types of document holdings, number of volumes, types of items meant for circulation, and the number and types member the institution has.[19].

III. METHODOLOGY

When a student enters class, the RFID reader reads his/her student ID card, while the detect simultaneously takes his/her id cards and sends it to the PC. After some time, the professor submits all data for storage in a database.[4], In libraries there are tasks, such as check-in and check-out, that can be further automated by use of this technology[5] This RFID system can also be implement for Library Management System. When student enters into library it scans the student ID same as attendance and only allow authenticate students in the library and when ever student leaves the library it checks for the RFID tag.[4] The architecture for library management system using RFID is shown in below figure. [4]As shown in the below figure for library management, RFID card will be used for entry and exit checking in and from library, for book checking (availability) purpose and for book withdrawal and return purpose.

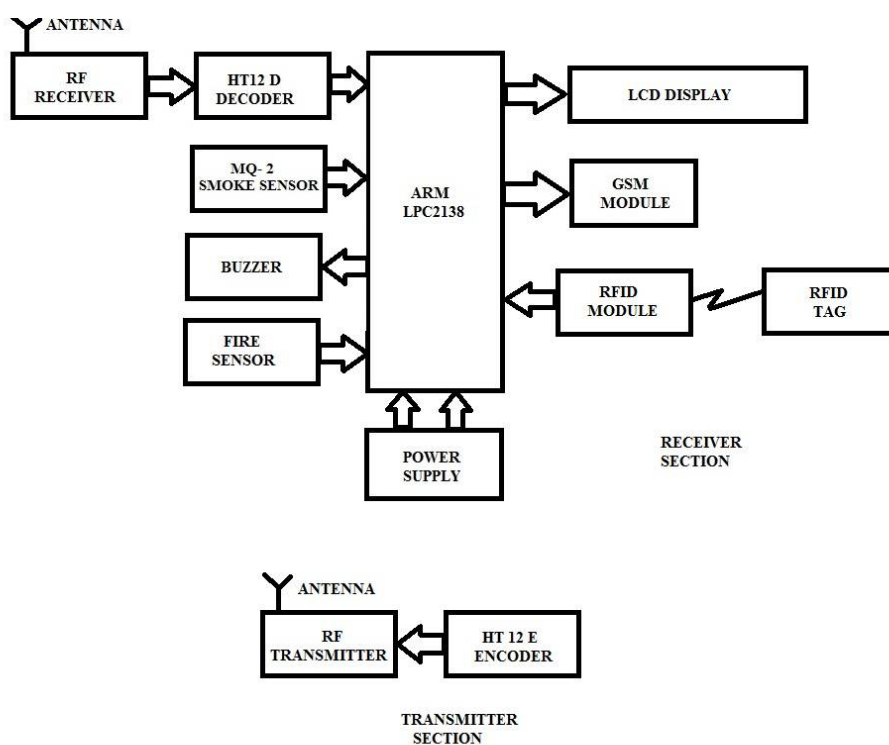


Fig.1System block diagram of the library management system.

A. Benefits of RFID Technology in Library are as follows:-

- ✓ Fastest, easiest, most efficient way to track, locate & manage library materials.
- ✓ Efficient Book circulation management.
- ✓ Automatic Check-in and Check-out.
- ✓ Library inventory tracking in minutes instead of hours.
- ✓ Multiple books can be read simultaneously.
- ✓ Unique ID of the RFID tag prevents counterfeiting.
- ✓ Automated material handling using conveyor & sorting systems.
- ✓ Facilitate inter library & intra-library borrowing

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 8, August 2016

IV. SYSTEM HARDWARE AND SOFTWARE CONFIGURATION

A. EXISTING SYSTEM

Till now the barcode system used in libraries. It is extremely time consuming. Relative advantages of RFID technology to current “barcode” based technology have become widely known such as contact-less recognition, batch processing of data. When an item is borrowed the barcode tag is desensitized and when returned the tag is activated again. It can be said that the defining characteristic of barcode based library management is the lack of efficiency. In libraries there are tasks, such as check-in and check-out that can be further automated by use of this technology. Though self-service check-in check-out units can also be based on barcodes, RFID offers better functionality. RFID readers can recognize several books at once whereas with barcodes each book needs to be read separately. This will save time as the library staff.



Fig 2 .book and user cards



Fig 3. Hercules software

B. SOFTWARE IMPLEMENTATION FOR THE SYSTEM

To accomplish the system, the choosing of software is very important. The Hercules and Microsoft Visual Studio 2008 are used as Integrated Development Environment (IDE). The C language is also used to implement the system. The Language is familiar with many users and suitable for design. Hardware & Software should meet global recommended standards for use of RFID in Libraries[5]

C. DESCRIPTION

The main objective of this system is to design a system for efficient library management. We are designing this system using RFID. The RFID tag would be with all the students and books. Whenever student enters the library, he will be given access by this system. All information regarding this student will be stored in this system. RFID tags will be given to each and every student and information for each tag will be stored in microcontroller. When tag given to student swiped, information of particular student will be displayed on LCD and PC through HyperTerminal. The information may contain roll number; class.. RFID stands for Radio-Frequency Identification. This is sometimes referred to as contact-less technology and a typical RFID system is made up of three components: tags, readers and the host computer system. Also RFID tags will be attached with every book and after swapping this book it will be assigned to that student. The sequence of swapping will be like this: First the student will have to swap the card and then the student should have to swipe the book. Also GSM is attached to this system for sending as SMS to student in

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 8, August 2016

case if student is not returning book after due date. Message will be generated by PC automatically to which GSM module is attached



Fig 4.GSM Module

D. GSM Modem (SIM900)

In this system GSM is used, operating frequency of GSM lies in between 900MHz and 1.8GHz bands. One of the most leading digital systems is GSM. GSM uses narrow band (TDMA).Of all time GSM becomes the world's fastest growing communications technology. It is the leading global mobile standard. GSM is an open, digital cellular technology, which is used for transmitting both data services and mobile voice .The GSM is able to support data transfer speeds of up to 9.6 kbps. It also allows the transmission of basic data services such as SMS.

E. FIRE SENSORE

A **fire alarm system** using in library is number of devices working together to detect and warn people through visual and audio appliances when smoke, fire, carbon monoxide or other emergencies are present. These alarms may be activated from smoke detectors, and heat detectors. Alarms can be either motorized bells or wall mountable sounders or horns. They can also be speaker strobes which sound an alarm, followed by a voice evacuation message which warn people inside the building not to use the elevators.

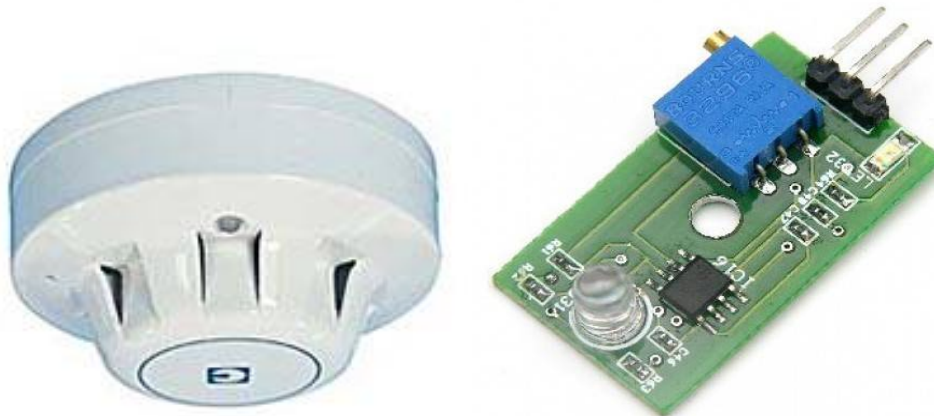


Fig 5-Fire Sensor

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 8, August 2016

F. SMOKE SENSORE

A smoke detector is a device that senses smoke, typically as an indicator of fire. Commercial security devices in library issue a signal to a fire alarm as part of a fire alarm system, while household smoke detectors, also known as smoke alarms, generally issue a local audible or visual alarm from the detector it self. Smoke detectors are used in library ,typically shaped like a disk about 150 millimeters (6 in) in diameter and 25 millimeters (1 in) thick, but shape and size vary. Smoke can be detected either optically (photoelectric) or by physical process (ionization), detectors may use either, or both, methods. Sensitive alarms can be used to detect, and thus deter, smoking in areas where it is banned. Smoke detectors in large commercial, industrial, and residential buildings are usually powered by a central fire alarm system, which is powered by the building power with a battery backup. Domestic smoke detectors range from individual battery-powered units, to several interlinked mains-powered units with battery backup; if any unit detects smoke, all trigger even in the absence of electricity.



Fig 6-smoke sensors

V. SIMULATION RESULTS

Each book would be uniquely identified via the RFID tags attached to it and communication would be done wirelessly. An RFID sensor would be placed near the library desk wherein one should only place the book near the sensor and it would get reissued/issued/returned depending on the actions required. Moreover information regarding the asset i.e. Book can be gained by both the authority and students remotely instead of the traditional way of manually searching the book. This would save a lot of time and enable efficient queue management. As actions on these tagged assets are being recorded, data can be usefully exploited as per librarian's need. Hence, it is tracking books within a limited transmission range.fig.5

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 8, August 2016



Fig 5 Controller Circuit

VI. CONCLUSION AND FUTURE WORK

This paper deals with the proposed system has made use of the latest technology available taking into account the cost optimization too to meet the application requirements and hence avoided higher precisions where not required. RFID, its application, standardization, and innovation are constantly changing. The RFID is an intelligent library management system which creates better service qualities like book searching, issuing and returning. The most significant time saving with bootable to the fact that information can be read from RFID tags much faster than form barcodes and that served items in the stack can be read at the same time. This system mainly reviewed the research and development work with the help of passive RFID technology .Future, this project is advanced point fire sensor and smoke sensor,its benefits for short circuit in library and detection over the problems occur due to short circuit in library and more over smoke detection.

REFERENCES

- 1.Dhanalakshmi M, UppalaMamatha "RFID Based Library Management System" Proceedings of ASCNT , vol.11, pp. 227 – 234,2009.
- 2.AUNG KYAW SAN, CHAW MYAT NEW "Library Management System using RFID" ,international journal of scientific engineering and technology reserch , Vol.03,Issue.08,Pages:1450-1454,may 2014.
- 3.PritiPawar, Kavita Shegaonkar, "RADIO FREQUENCY IDENTIFICATION BASED LIBRARY MANAGEMENT SYSTEM",INTERNATIONAL JOURNAL OF INNOVATION IN ENGINEERING, RESEARCH AND TECHNOLOGY [IJIERT] NATIONAL CONFERENCE ON INNOVATIVE TRENDS IN ENGINEERING & TECHNOLOGY,vol.03,ISSN NO - 2394-3696,march 2016
4. Karen Coyle, "Management of RFID in Libraries" ,Preprint version of article published in the Journal of Academic Librarianship, v. 31, n. 5, pp. 486-489,2010
5. Molnar, David and David Wagner. "Privacy and Security in Library RFID: Issues, Practices, and Architectures" in: ACM Workshop on Visualization and Data Mining for Computer Security (Washington, D.C.), vol.05,Pp. 210-219,2004.
- 6.Priyanka Shambharkar, Ravina Sukhdeve, Swapnil Gujjanwar, RFID Based Library Management System, Discovery Publication, Volume 19,pp 55, May 11, 2014.
- 7.R.Praveen Kumar,M.Ruba,P.Sathish kumar, D.Sowmiya, SK.Varsha, RFID BASED LIBRARY MANAGEMENT SYSTEM, International Journal of Advanced Research in Biology Engineering Science and Technology (IARBEST) ,Vol. 2, pp.398-402,10, March 2016.
- 8.MrinaliniGhewari, Soniya Shetty, Bhagyashree Shinde, Akshata Patil ,“Automated Library Management System” International Journal of Advanced Research in Electronics and Communication Engineering (IJARECE) Volume 5, pp-92-93,Issue 1, January 2016

BIOGRAPHY



1.Supriya .C.Kulbhaiyya : Student of ME (E& TC) 2ND Year CSMSS Engineering collage, Aurangabad, Maharashtra ,India. B.E (EC) From M.I.T Engineering collage Aurangabad, Maharashtra.



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 8, August 2016



2.**Devendra.L.Bhuyar** did his Master of Engineering in Electronics & Telecommunication from Sant Gadge Baba University, Amravati in year 2012, has 12 year of teaching Experience. Presently working as an Assistance Professor & HOD in Electronics & Telecommunication department of CSMSS Chh. Shahu college of Engineering, Aurangabad (M.S).Has Published 5 Papers in different journals and conferences