Solving Problems of Library Management System

[1]S.Pothumani, [2]J.Sridhar

[1,2]Assistant Professor, Dept. of CSE, Bharath University, Chennai, Tamil Nadu, India

ABSTRACT: A major objective of Library Management is tracking of books within the library. The conventional means of this tracking is the bar-code system which has some restrictions. RFID based systems enable smoother tracking and optimized performances and also aid in lowering the worker costs as it ensures a complete automated environment. This work evaluates the functioning of an Automated Library with the aid of RFID and sensor. This project seeks to solve the problem of misplaced books in libraries. Librarians are constantly frustrated by misplaced books due to library users placing them back incorrectly onto the shelves. The Librarian is a robot that will be able to autonomously traverse the aisles of a library while scanning books to determine if they are in their expected locations. The aim is to save library employees the daunting task of shelf reading and as a result enable a better allocation of resources within the ibrary.RFID helps in telling the availability of books and sensors help in tracking out the exact location.

I. INTRODUCTION

RFID systems are mainly used to identify objects or to track their location without providing any indication about the physical condition of the object. WSNs on theother hand, are Networks of small, cost-effective devices that can cooperate to gatherand provide information by sensing environmental conditions such as temperature,light, humidity, pressure, vibration, and sound. WSNs provide cost-effective monitoring of critical applications including industrial control, border monitoring, environmental monitoring, military, home applications, and healthcare applications, book management applications. The evolution of RFIDand WSNs has

followed separate research and development paths and has led to distinct technologies. Nevertheless, there are many applications where the identity or the location of an object is not sufficient and extra information that can be retrieved through sensing environmental conditions is important. Although sensor networks may be used in these environments as well, the location and identity of an object remain critical information that can be retrieved through RFID systems. The optimal solution in these cases is the integration of both technologies because they complement each other. Utmost care has been taken to provide following features to the Library using RFID Technology and WSN technology:

- □ To remove manual book keeping of records
- □ Traceability of books and library members as they Move
- □ Improved utilization of resources like manpower, infrastructure etc.
- □ Less time consumption as line of sight and manual interaction are not needed for RFID-tag reading.
- □ To provide 2 meters read range antennas
- □ To minimize the manual intervention
- □ To minimize the manual errors
- □ To provide the long lasting labels
- □ To provide fast searching of books

II. SYSTEMDESCRIPTION

We use passive RFID tags ,RFID antennas,RFID readers integrated with sensors , a base server to track the location of a particular book. Books placed in each rack is embedded with a RFID tag.[1] Set of books belonging to a particular department are kept under each rack. We keep sensors (integrated rfid readers with sensors) in each rack. "fig1"describes integration of rfid with sensor. "Fig2"describes the components used in retrieval system.[4]
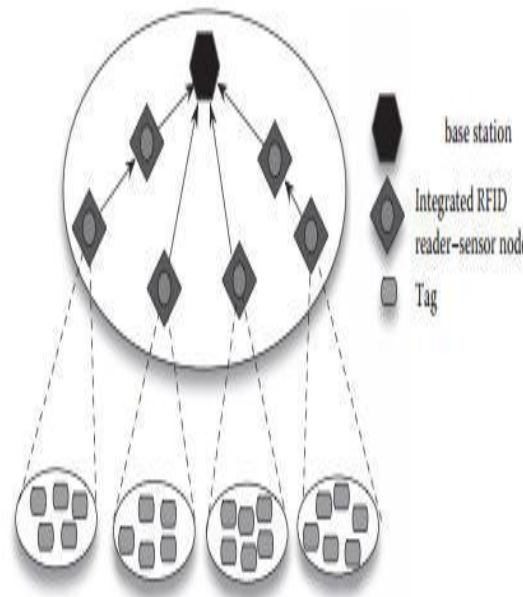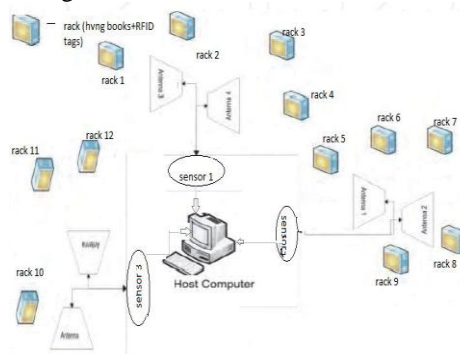

Fig1.Integration of RFID readers with sensor nodes

Fig2. Implementation in library

III. SYSTEM COMPONENTS

Tags:
RFID tag is the heart of the system as shown in fig3, which can be fixed inside a book's back cover or directly onto CDs and videos[5]. This tag is equipped with a programmable chip and an antenna. Each paper thin tag contains an engraved antenna and a microchip with a capacity of at least 64 bits.These are three types of tags 'read only', 'WORM', and 'read/write'. Tags are read only if the identification is encoded at the time of Manufacture and not rewritable 'WORM' (write once read many) tags are programmed by the using organization, but without the ability to rewrite them later 'Read/Write tags' which are chosen by most libraries, can have information changed or added.[3]

Sensor: It senses the signal from the tags embedded in the books.[6] A receiver device called as reader detects the signal as soon it enters into its radio range and decodes the number for interpretation; Reader interrogates the tags and offers optimum reading performance enabling instant data capture when passed alongside the items in a continuance movement. The devices used within the building are usually called 'readers' while the ones used at building exits are usually called 'sensors'. **Antenna:** An antenna is connected to the reader to help to process identification of the items and activate/deactivate the tag antitheft function simultaneously.[2] Additional antenna can be added to increase the number of item processed in case of larger transactions. **Server:** The server is the heart of some comprehensive RFID systems. It is the communication gateway among the various components. It receives the information from one or more of the readers and exchange information with the circulation database[7]. Its software include the SIP/SIP2 (session initiation protocol), APIs (Application Programming Interface) NCIP or SLNP necessary to interface it with the integrated library software.

IV. WORKING PRINCIPLE

The Flowchart in "Fig4" specifies the way to implement the idea. The procedure is as follows:
1. User enters rfid number and book name in the server to find whether the book is available or not.
2. The server checks the database[8]. If it is not present,
3. is present, the server returns used by someone else.
4. If the book sends the control to the sensors connected in some topology(preferably star).
5. The sensors in the reader reads the rfid signals corresponding to its fixed range. If found in first sensor it **returns the rack** number else it is continued until all sensors sense its domain[9]. Finally the rack number is returned to the user along with rfid number from the server.
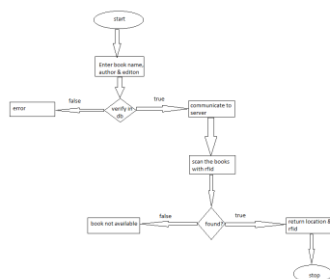

Fig4.Flow Chart for the proposed system

V. SPECIFICATIONS

Passive RFID is well suited for tracking lower cost assets where the tagged item will reliably come into close proximity to a reader or choke point, ensuring that it will be
read without requiring additional manual intervention. Active sensors are used since readers supply voltage for its function.[10] We update the database in the server by specifying
the book name, rfid number, book id, author-name, edition in the database.

VI. ADVANATGES

Primary advantage is High speed of RFID .It helps in easy retrieval of the books. Secondary advantage is its Multipurpose and many other forms. Most important added advantage is its Reduced man-power Reduced Complexity.

VII. FUTURE ENHANCEMENT

In further, these plan can be implemented are plan to do this technique through online also. Many see RFID as a technology in its infancy with an untapped potential[11]. While we may talk of its existence and the amazing ways in

which this technology can be put to use, until there are more standards set within the industry and the cost of RFID technology comes down we won't see RFID systems reaching near their full potential anytime soon.[12]

VIII.   CONCLUSION

RFID technology is not only emerging but also more effective, convenient and cost efficient technology in library security. This technology has slowly begun to replace the traditional bar-code on library items. The RFID tag can contain identifying information such as a book's title or material type, without having to be pointed to a separate. The information is read by an RFID reader, which replaces the standard barcode reader commonly found at a library's circulation desk.

The RFID tag found on library materials. It may replace or be added to the barcode, offering a different means of inventory management by the staff and self service by the borrowed. It can also act as a security device, taking the place of the traditional electromagnetic security strip. And not only the books, but also the membership cards could be fitted with an RFID tag. The cost of the technology is main constraints.

REFERENCES

[1] 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

[2] Udayakumar R., Khanaa V., Kaliyamurthie K.P., "High data rate for coherent optical wired communication using DSP", Indian Journal of Science and Technology, ISSN : 0974-6846, 6(S6) (2013) 4772-4776.

[3] Boss, Richord W. RFID Technology for Libraries. 2009 (http://www.ala.org/ ala/pla/plapubs/ technotes /rfid technology)

[4] Vijayaprakash S., Langeswaran K., Gowtham Kumar S., Revathy R., Balasubramanian M.P., "Nephro-protective significance of kaempferol on mercuric chloride induced toxicity in Wistar albino rats", Biomedicine and Aging Pathology, ISSN : 2210-5220, 3(3) (2013) pp.119-124.

[5] Firke, Yogaraj S. RFID Technology for library security. In Emerging technology and changing dimensions of libraries and information service by Sanjay Kataria and others. New Delhi, KBD Publication.2010

[6] Udayakumar R., Khanaa V., Kaliyamurthie K.P., "Optical ring architecture performance evaluation using ordinary receiver", Indian Journal of Science and Technology, ISSN : 0974-6846, 6(S6) (2013) pp. 4742-4747.

[7]Lindquist,M.G. RFID in libraries-Introduction to the issues. In world library and information congress paper presented at 69th IFLA general conference and council. Berlin.1-9 August 2003 available at http://ifla.queenslibrary.org/IV/ifla69/papers

[8] Sundararajan M., "Optical instrument for correlative analysis of human ECG and breathing signal", International Journal of Biomedical Engineering and Technology, ISSN : 0976 - 2965, 6(4) (2011) pp.350-362.

[9]Ranawella,T.C.,2006 An introduction to a library material management and security control system-Radio Frequency Identification technology. Journal of the University Librarian Association of Srilanka.10,2006.
http://www.sljol.info/index.php/JULA/article/view PDFInterestitial/316/359accessed as on 17.12.2009

[10] Udayakumar R., Khanaa V., Kaliyamurthie K.P., "Performance analysis of resilient ftth architecture with protection mechanism", Indian Journal of Science and Technology, ISSN : 0974-6846, 6(S6) (2013) pp. 4737-4741

[11] Syed, S., 2005 Use of RFID Technology in libraries : a new approach to circulation, tracking, inventorying and security of library materials. Library Philosophy and Practice. 8(1), 15-21.

[12] P.JENNIFER, DR. A. MUTHU KUMARAVEL, Comparative Analysis of advanced Face Recognition Techniques, International Journal of Innovative Research in Computer and Communication Engineering, ISSN(Online): 2320-9801, pp 4917-4923 Vol. 2, Issue 7, July 2014

[13] Dr.R.Udayakumar, Computer Simulation of Polyamidoamine Dendrimers and Their Complexes with Cisplatin Molecules in Water Environment, International Journal of Innovative Research in Computer and Communication, ISSN(Online): 2320-9801,pp 3729,25-30, Vol. 2, Issue 4, April 2014

[14] DR.A.Muthu kumaravel, Mr. Kannan Subramanian, Collaborative Filtering Based On Search Engine Logs, International Journal of Innovative Research in Computerand Communication Engineering, ISSN(Online): 2320-9801,pp 2432-2436, Vol. 2, Issue 1, January 2014

[15] Dr.A.Muthu Kumaravel, Mining User Profile Using Clustering FromSearch Engine Logs, International Journal of Innovative Research in Computerand Communication Engineering, ISSN(Online): 2320-9801,pp 4774-4778, Vol. 2, Issue 6, June 2014

[16] P.Kavitha, Web Data High Quality Search - No User Profiling, International Journal of Innovative Research in Computerand Communication Engineering, ISSN(Online):2320-9801,pp 2025-2030, Volume 1, Issue 9, November 2013