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RFID TECHNOLOGY IN LIBRARIES

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Abstract:
RFID is the latest technology to be used in library theft detection systems. This article provides details about RFID security System. It is one of the fasted growing and most beneficial technology adopted by academic library for increasing efficiency and improving the safety, security, productivity, accuracy and convenience. This technology is also helpful in taking finding missing items and identifying misfiled items. This article also introduce of the various components of RFID system, how the system works, advantages and disadvantages of the system and various point to be consider on RFID Library Management System.

Keywords: RFID, Library Management System, Security Systems, RFID Antenna

1. INTRODUCTION

RFID means Radio Frequency Identification is the use of wireless non- contact radio system to transfer data from a tag attached to books, for the purpose of automatic identification and tracking. It is one of the most technologies being adopted by both industry and academic world. Modern academic library is a place where millions of books, periodicals, CDs, DVDs and other electronic reading materials are contained. It is a challenge to manage for librarians such type of huge collection. In RFID technology using RFID tags in library and it is easy and convenient. Library staff handle lending, returning, sorting, tagging etc, of books using RFID tags in library system. The tag contains electronically stored information which can be read from up to several motors away. RFID is an accepted technology in libraries, thanks in part to the profession's adoption of best practices that minimize the technology's potential to erode library users' privacy.

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2. WHAT IS RFID?

RFID technologies are grouped under the more generic Automatic Identification technologies. This technology includes Smartcards and Barcodes. RFID is often positioned as next generation bar coding because of its obvious advantages over barcodes. It is a method of remotely storing and retrieving data using devices called RFID tags. This tag is a small object, such as an adhesive sticker that can be attached to incorporate into a product. RFID tags contain antennae to enable them to receive and respond to radio-frequency queries from an RFID transceiver.

3. OBJECTIVES OF THE STUDY

- To understand the working methodology of RFID Technology
- To demonstrate the role of RFID Technology for library management perspective
- To examine the competitive advantages of RFID Technology
- To comprehend the implications while using RFID Technology
- To find out role of librarians while adopting RFID Technology in libraries

4. COMPONENTS OF RFID SYSTEM:

RFID technology has consisted of following components like tags, readers, antenna and server which can be explained one by one.

4. 1. RFID Tags:

It is also called transponder. Tag is the heart of the RFID system, which can be fixed inside a book's back cover or directly onto CDs and videos. Tags are electronically programmed with unique information. The size of the tag depends on the size of the antenna, which increases with range of tag and decreases with frequency. 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. There are three types of tags: "read only", "WORM," and "read/write".

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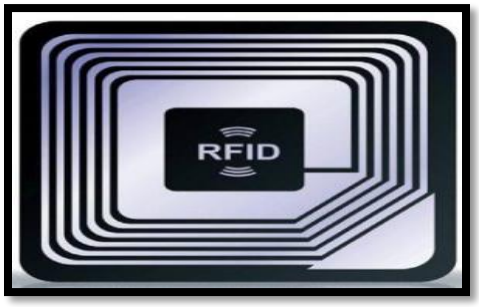

Figure. 1. RFID Tags

4. 2. RFID Antenna & Reader:

The second component in RFID system is the antenna or reader. It is also known as sensors or interrogators. Technically, its units are transceivers and their usual role is to query a tag and receive data from it. RFID reader converts radio waves from RFID tags into a form that can be passed to middleware software. RFID tag reader use antennas to communicate with the RFID chip. It can read information stored in the RFID tag and also update RFID tag with the new information.

Figure. 2. RFID Reader

4. 3. Server:

The server is the heart of 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. The server typically includes a transaction database so that the reports can be produced.

4. 4. Optional Components:

Optional RFID system includes the following three components

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- RFID Label Printer
- Handheld Reader
- External Book Return

5. RFID LIBRARY MANAGEMENT SYSTEM

Using RFID technology in libraries saves time of library staff's by automatizing their tasks. Uses RFID library management saves the times a book reader. Taking care of books and making them available to the book readers are important tasks. Majority of the library staff spent the time in keeping the record of incoming and outgoing of books.

RFID tags can be placed inside the cover of each book. All bibliographic information about the each book is entered into the Library Management Software. Whenever a user brings a book for issue-return purpose, the RFID reader from the tag reads the information pertaining to that book and transmits the data into the software and document is issued in a few seconds without the assistance of the library staff. As the user takes the document outside the library, the antenna placed at the exit gate automatically reads the information contained on the RFID tag to verify whether the document is properly issued or not. In case, it is not issued to the user as per library norms or it is being stolen from the library, the antenna senses it and gives an instant alert. Thus, it results in successful theft reduction of documents. RFID technology is not only being used for circulation purpose in the libraries, it is also used for stock taking purpose.

RFID can be used library circulation operations and theft detection systems. It is easier and faster charge and discharge of materials handling. This technology helps librarians reduce valuable staff time spent scanning barcodes while charging and discharging items. The targets used in RFID services can replace the barcodes.

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Figure. 3. RFID Library Management System

6. ADVANTAGES AND DISADVANTAGES OF RFID SYSTEMS

6.1 Advantages of RFID systems

1. Automated issue/return
2. To increase circulation staff productivity
3. Rapid charging/discharging
4. Automated materials handling
5. Simplified patron self-charging/discharging
6. High reliability
7. High-speed inventorying
8. Automated materials handling
9. Long tag life
10. Fast Track Circulation Operation
11. High level of security
12. Easy stock verification
13. Automated sorting of books on return
14. Technology standards to drive down cost
15. Miss-shelve easy identification
16. RFID tags replace both the bar code and traditional security systems

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17. So reduce tosses of library material like CDs, DVDs, books etc.
18. To provide more value added future services with same number of staff.

6.2 Disadvantages of RFID Systems

1. High cost
2. Vulnerability to compromise
3. Accessibility to compromise
4. Exit gate sensor (Reader) problems
5. Removal of exposed tags
6. Frequency Block
7. Chances of removal of exposed tags exit gate sensor problems
8. User Privacy concern
9. Lack of Standard

7. CONCLUSION

Librarians are using various new inventory technologies in libraries and they have started using RFID to give more effective and efficient circulation services as well as for security of library collections. It is more effective, convenient and cost efficient technology in library security. This technology has replaced to the traditional barcode on library items. Day-by-day the use of RFID system by libraries has grown dramatically, but the cost factor, non-availability of standards and user privacy is the major barriers in adoption of RFID technology by more libraries. As far as the cost constraints are concerned, once the libraries implement such a technology, its benefits can be realized in terms of "Return on Investments" as it will speed up the circulation process and the staff can perform other user centric services.

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