DIGITAL ERA OF RFID IN LIBRARY AUTOMATION

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ABSTRACT

In this paper we discuss about RFID uses in library automation. What is RFID? RFID technology in Libraries. Rfid for Libraires. Rfid advantage and disadvantage. The article saying about RFID that how can we effective uses of libraries serves with RFID systm.

Key words: RFID, Libraries, advantage, disadvantage etc

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1. INTRODUCATION

Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify and track tags attached to objects. The tags contain electronically-stored information. Passive tags collect energy from a nearby RFID reader's interrogating radio waves. Active tags have a local power source (such as a battery) and may operate hundreds of meters from the RFID reader

Libraries have used RFID to replace the barcodes on library items. The tag can contain identifying information or may just be a key into a database. An RFID system may replace or supplement bar codes and may offer another method of inventory management and self-service checkout by patrons.

Libraries across the United States and around the world have begun to use RFID technologies to streamline the materials handling, inventory control, and check-out, check-in process. The technology used in libraries is the same technology used in other applications of passive tag RFID. In the library setting, RFID is used to reach two key goals: sightless identification for a variety of applications and theft detection

2. RFID TAGS IN LIBRARIES

The RFID tags used in libraries are passive tags so the tags do not need an energy source of their own, and therefore can be quite small. There are three different types of passive tags that can be used in a library, information center, or archive. Each of these types of tags has an

antenna etched onto a microchip that has at least a 64 bit capacity. The tags differ in how the information to the tag is written. Read only tags are not re-writable and the unique identification code is encoded when the tag is manufactured. Write once-read many (WORM) tags, can be encoded at the library to match the bar code numbers if those numbers are currently in use. This tag cannot be rewritten but information about the book title and author can be added. Read/write tags are the most commonly used tags for libraries because they have the ability to have information added and changed as needed. Data concerning the library branch can be updated. Additionally, these tags can have a security bit encoded that can be turned on and off by the reader

3. RFID READERS IN LIBRARIES

RFID readers create an electromagnetic field around them. When the tag passes through this field it is read. The position of the tag within this field is irrelevant, so long as the tag is within the 1-3 ft. range of the reader. Readers have the ability to deal with a number of tags at the same time. Libraries can use readers in different locations in the library to accomplish different functions. Readers at the staff work stations of the circulation desk will allow the staff to check items into and from the library's collection. Readers at patron self check out station allow the patron to do the same. Larger walk-through readers at the exits of the library can be used for theft control. There are two types of readers that can be used at the exits, one that communicates with the Integrated Library System (ILS) to determine the circulation status of the item, and another type that reads the security bit written onto the tag at checkout. Readers at the book drop can be used to return items to the library's collection. Additionally, the book drop readers can be part of a larger system that includes conveyor belts and sorters to separate the items for return to different locations in the library. Readers can also be portable to read groups of items to complete an inventory of the library. The readers can determine if an object is present, and if an object is in the correct location without having staff actually touch the object

4. RFID SECURITY IN LIBRARIES

By using read/write tags in combination with exit readers, libraries will be able to use the RFID system for theft detection. The security bit can be deactivated at checkout. Then, the exit readers will not react to the security bit. If the bit is active, because the item was not checked out, the item will set off the alarm at the exit sensors. Some libraries use a surveillance system that is triggered by this alarm so the person taking the item though the exit will be caught on video. When the item is returned to the library, this security bit is reversed.

5. HOW RFID SYSTEM WORKS IN THE LIBRARY

The RFID technology works through flexible, paper-thin RFID tags, which can be placed inside the cover of each and every document. Complete information about each document is entered into the Library Management Software. Whenever a user brings a document 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.

Figure A System Flow

Figure B

6. RFID Technology in Libraries

The idea of RFID can be simplified to that of a digital barcode and can be used to pick out, tune or locate library holdings on the move. It eases the desk and in the everyday stock renovation. This technology includes smart RFID labels, hardware and software programs. RFID provides libraries with a more powerful way of managing their collections at the same time as offering more customer support to their purchasers.

7. RFID FOR LIBRARY

1. RFID tags replace both the EM security strips and Barcode.
2. Simplified patron self check-out / check-in.
3. Ability to handle material without exception for video and audio tapes.
4. Radio Frequency anti-theft detection is innovative and safe.
5. High-speed inventory and identify items which are out of proper order.
6. Long-term development guarantee when using Open Standard.

8. ADVANTAGES OF RFID SYSTEMS

1. Rapid charging/discharging
2. Simplified patron self-charging/discharging
3. High reliability
4. High-speed inventorying
5. Automated materials handling
6. Long tag life
7. Automation for Library

9. DISADVANTAGES OF RFID SYSTEMS

1. High cost
2. Vulnerability to compromise
3. Removal of exposed tags
4. Exit sensor problems

10. CONCLUSION

Librarians are always known as early adopters of technology and they have started using RFID to provide more effective and efficient circulation services as well as for security of library collections. Although the use of RFID by libraries over the last few years has grown dramatically, yet the major barriers of RFID technology adoption by more libraries is its cost factor, non-availability of standards and user privacy. 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. Regarding the non-availability of standards, those libraries which are planning to implement RFID must use RFID tags that are ISO 28560 compliant in addition to ISO 15693, ISO 18000-3 and other global standards and protocols given by NISO. It is also very important that to protect user privacy, libraries should follow standard guidelines and store no personal information on RFID tags. Whether the libraries are using RFID technology today or not, they cannot avoid it as nowadays the book distributors have started selling books which are already tagged without any extra cost.

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