

RFID TECHNOLOGY IN ACADEMIC LIBRARIES

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Abstract:

RFID Radio frequency identification is a technology where digital data encoded in RFID Tags. It is an automatic data capture technology that use radio frequency waves to read information stored in tags.

It is the latest technology used in libraries. In library dissemination and shelving of reading materials is quit hefty work which consume most of the time of library staff. RFID gives a solution to such type of situation and problems. “RFID tags are used in a library management system which are easy and convenient for issuing, returning and sorting of books” this paper explains the RFID role, application, advantages and disadvantages related to use of RFID in Libraries.

Keywords: *RFID Technology, barcode Technology, Digital Library.*

Introduction:

RFID means Radio Frequency identification is the use of wireless non contract radio system to transfer data from a tag attached to books, for the purpose of automatic identification and tracking. It is one the most excellent technology adopted in academic world. Modern academic library is a place where millions of books, periodicals, CDs, DVD's and other electronic reading material are contained. It is a Challenge to manage for librarians such type of huge collection. In RFID Technology using RFID tags is a easy and convenient to use in library. RFID requires a device known as reader and it is receiving any data stored in RFID tags. These RFID tags havemicrochips that contain two gigabytes of data. The operation of RFID is vast and does not require line of sight path or physical contact between the reader and the tagged item.

Objectives of RFID

1. To study the different elements of RFID required for library automation.
2. To understand the working methodology of RFID technology.
3. To examine the current issue associated with the implementation of RFID.
4. To demonstrate the role of RFID technology for library management perspective.
5. To see whether RFID improve the users opinion on satisfaction.
6. To examine the competitive advantage of RFID technology.
7. To check the actual time consumed for implementation RFID in libraries.
8. To find out role of librarians while adopting RFID technology in libraries.

Components of RFID

RFID technology for libraries include RFID tags a self –check out station, self return book drop with an automatic check in feature, a tagging station a set of security gates , and shelf scanner for stock verification and administration reasons let us know about the components of RFID.

➤ **RFID tags:**

The heart of the system is the RFID tag and can be fixed inside the library books, CD's , DVD's and another materials. The antenna which grows with tag range and shrinks with frequency determine the size of the tags. An antenna and programmable chip are included with this tag. There 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.

➤ **Reader/ Sensor Gates:**

The second component of RFID system is the reader. It is also known as sensor or interrogators. The device called a RFID reader is used to collect data from RFID tag which is used to track library books. Data is transferred from the RFID tag to the reader using radio waves. When books, documents or other items taken outside the library without being checked out, sensor gates alert the library employees.

➤ **Antenna:**

An antenna is connected to the reader to help to process identification of the item and activate/deactivate the tag anti theft function simultaneously. Additional antenna can be added to increase the number of items processed in case of large transaction.

➤ **Server:**

A server is configured with RFID system and acts as a communication gateway among various components. It receives data or information from one or more of the readers and exchange information with the circulation database. Its software includes the SIP/SIP2 (Session Initiation Protocol) APIs (Application Programming Interface) NCIP (National Circulation Interchange Protocol) necessary to interface it with the integrated library software.

➤ **RFID Self Check Unit:**

User identification is done with an RFID –ID Cards users can put books onto the reader surface in front of the self check unit to be registered under particular name. It reads all information about the book and one can choose the option to check out the display on the screen to take the book.

➤ **Staff Station with Antenna:**

Staff station consists of antenna, electronic Module and power supply. Staff Station is a staff supported station to tag and register the library material into web based library software stock management system. Here RFID tags and an anti-theft sticker are implanted into the book to prevent unauthorized use of the tags. The RFID tags used for library materials contain an arming/disarming module that may be programmed to either activate or deactivate the EAS gate alarm. The staff loads the library book or material onto the reader and gives it a special identification number ('The Accession Number') which is then recorded on the server.

➤ **Shelf Management:**

The Shelf Management solution makes it simple for library staff member to find and recognize things on the shelves. It consists of a base station and a mobile scanner. It assists with stock authentication the search for any misplaced books, and user request for specific books. By moving the portable scanner across the book spine on the book shelves, these tasks are accomplished.

➤ **RFID ID Cards:**

Tag is made up of an integrated antenna and memory the information can be written and rewritten on tag memory. The unique ID written on tag at the time manufacturing is known as the EPC (Electronic Product Code). This tag is enclosed in a rectangular plastic card.

Advantages of RFID

- ❖ Increasing the effectiveness in self check in and check out: This technology is not like barcode technology. Infact RFID reader don't need line of sight and can read multiple tags concurrently.
- ❖ Reliability: we can also able to see the item which is going out of the library. The most important is when RFID is used in theft detection.
- ❖ High speed inventorying: Ability to scan book on the shelves without removing them out. A hand held inventory reader can be moved rapidly across a shelf of books to read all the unique identification information using wireless technology, it is possible to update the inventory, but also to identify item which are out.
- ❖ Improves overall efficiency of the library task.
- ❖ Long tag life: RFID tags last longer than barcodes because nothing comes into contact with them most RFID vender claim a minimum 100000 transaction before the tag may need to be replaced.
- ❖ Fast Track Circulation Operation: the use of RFID reduces the amount of time required to perform circulation operation. It is one of the most powerful time saving tool.
- ❖ Man power saving by avoiding repetitive physically stressful tasks like stock verification and shelf rectification.
- ❖ RFID made the services like payment of fees, fine etc. are very quick.
- ❖ Faster and accurate re-shelving ensures users to find items in proper place.

Disadvantages of RFID

- ❖ The implementation cost of this technology is very high the small library finds it difficult to build because the necessary hardware is pricey.
- ❖ Vulnerability to compromise: It is possible to compromise, RFID system by placing two items against one another so that one tag overlaps another.
- ❖ Removal of exposed tags: the RFID tags cannot be concealed in either spine or gutter of the books and are exposed for removal.
- ❖ Chance of removal of exposed tags exit gate sensor problem.
- ❖ Reader collision.

Conclusion:

Academic libraries are always recognized as primary adopter of technology and they are happening using RFID to offer more effective and efficient circulation services. In the first step it is very difficult to select the RFID tags for library materials. So librarian should carefully observe the tag reading range and capacity to meet expectation. And it is very important to check RFID tag is unbroken due to liquid and other issues. For better management the proper planning and budget is required. In library terms security, RFID technology is not only more advanced but also more practical, Convenient and affordable. RFID is modern technology to be used in theft detection system. RFID is becoming more and more popular among libraries. It is important to educate library staff and library users about RFID technology before implementing a program.

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