International Journal of Information Movement Vol.5 Issue V (September 2020)
Website: www.ijim.in ISSN: 2456-0553 (online) Pages 24-27

USE OF RFID TECHNOLOGY IN ACADEMIC LIBRARY: A THEORITICAL APPROACH

Dr. Purnima Pandey,
Assistant Professor
Prof. H.N. Mishra College of Education, Kanpur

Abstract: Rapid development in the field of information processing, storage and communication technologies have revolutionized the role of libraries in disseminating information services to their users. Today libraries are facing new challenges, new demands, new expectations from their users and fulfilling the increasing demands of their users, libraries should reconsolidating their positions, redesigning their services, incorporating new technology. Now a day technology plays a major role in every library to provide accurate, update and quick information. RFID is one of the latest technologies used by many libraries. In this paper what is RFID technology, its components and uses of RFID technology in libraries are discussed. RFID technology has some advantages and disadvantages. These are also mentioned in this paper.

Keywords: RFID, Tags, Reader, Server

1.0 Introduction:

RFID stands for radio frequency identification. It is latest technology used in every modern library for theft detection and tracking. RFID is a combination of radio-frequency based technology and microchip technology. RFID technology uses radio waves to automatically indentify people or objects or materials. In this technology by a reader. This reader converts the radio waves reflected back from the RFID tags into digital information. This information then pass onto computer and the computer makes this information available to us. RFID technology was first used in World War II to differentiate between friendly and enemy aircrafts. After that this technology has developed much more and how it is applied in industry, commercial sector and the library community for security purpose.

2.0 Components of RFID :

The main components of RFID technology are discussed below –

2.1 Tags: Tags are also called transponders. Each paper – thin tag contains an engraved antenna and a microchip with a capacity of at least 64 bits. Tags are affixed into library materials, CDs and DVDs ets. Tags are of three types- **"read only"** (WORM) tags are programmed by the using organization, but without the ability of rewriting them later and **"read/write"** tags which are chosen by most of the libraries since information stored in these tags can be changed or new information can be added in future. RFID tags may be either active or passive.

2.2 Readers: Readers are also known as sensors. Readers are radio frequency devices. Reader consists of a radio frequency module, a control unit and an antenna. They detect and read tags to obtain the information stored on the tags. The reader powers and antenna to generate an RF field. When a tag passes through the field, the information stored on the chip in the tag is interoperated

by the reader and sent to the server, which in turn communicates with the integrated library system when the RFID system is interfaced with it.

2.3 Antenna: The antenna produces radio signals to activate the tag and read and write data to it. Antennas are the channels between the tag and the reader.

2.4 Server: Server is the communications gateway among the various components. It receives the information from one or more of the readers and exchange information with the circulation database of the library system.

3.0 RFID technology in Library :

RFID technology is used in library mainly to detect the unauthorized removal of library materials. Since academic libraries have huge collections, now it becomes very difficult to control unauthorized removal of library materials. The RFID technology in libraries can be implemented in the following four ways – (a) Library Security System (b) Library Circulation Counter (c) Self Check In and Check Out (d) Smart and Quick Inventory.

3.1 Library Security System:

The library security system through RFID can be ensured through exit sensors or security gate. When the library reader's passes through the security gate with the library materials without authorized issues from the library staff then the gate will alarm a sound and warning light signal indicating that something wrong has taken place in the library. These security gates are basically two types. One type reads the information on the tag(s) going by and communicates that information to a server. The server after checking the circulation database turns on an alarm if the material is not properly checked out. Another types relies on a theft bit in the tag that is turned on or off to show that the item has been issued or not, making it unnecessary to communicate with the circulation database.

3.2 Library Circulation Counter:

The library circulation counter is a staff assisted station. It helps in library circulation functions such as issue, return, tagging, sorting of documents etc. The library staffs puts the library materials on the reader and can view the information stored inside the tag and perform the transaction function accordingly.

3.3 Self Check in and Self Check out:

The Self Check Out station is basically a computer with normally touch screen, a built-in RFID reader and special software for personal identification and material identification. The mechanism of Self chech out station is same as an ATM machine. Here the user is asked to enter his/her personal ID number. Then next step is to enter how many books he/she want to issue. After that next step is to place the book in fron of the screen on the reader and display will show the book title and its ID number which have been check out. After confirmation by the user the check out process is finished and a receipt is generated showing which books are borrowed. The same time the RFID tag in the book is set on quite so that no alarm will go aff at the security gate. In case of return of a book the process is same as above.

Another facility available in the library where RFID technology used is that a user can return library material at any time of the day even a library is closed. for this purose Book Drops are set at different location within or outside the library. In this process, the user inserts the

library materials into book drop and RFID reader reads tagged materials and flashlight. Simultaneously tag attached to the library material is activated.

3.4 Smart and Quick Inventory:

This system helps I locating and identifying library materials on the shelves without removing the library materials from the shelves. This function is performed by a hand-held inventory reader. It helps not only to update the inventory but also to identify item, which are out of proper order.

4.0 Advantages of Using RFID technology in Library :

There are some advantages of using RFID technology in library. These are given below-

1. RFID system claims an almost 100% heft detection rate using RFID tag.
2. The use of RFID reduces the amount of time required to perform circulation operations. So it saves the time of library staff. The facility of self charging/self discharging increases the utility of the library.
3. An RFID reader can read tags faster than barcode scanner can scan barcodes. It is another advantage of RFID technology.
4. Another advantage of RFID system is the ability of scan books on theshelf without tipping them out or removing item. It is done by a portable hand-held reader. It can be also be used for sack verification and finding of misplaced items.
5. Finally, RFID tags last longer than barcodes because the technology does not require line of sight. RFID vendor claim a minimum of 1,00,000 transaction before a tag may need to be replaced.

5.0 Disadvantages of RFID technology:

There are some disadvantages are also in RFID technology-

1. RFID technology is its high cost. The readers and gate sensors cost are around $2,000 to $3,500 each and the tag cost $40 to $75 each.
2. It is possible to compromise an RFID system by wrapping the protected material in two to three layers of ordinary household foil to block the radio signal. It is also possible to compromise an RFID system by placing two items against one another so that one tag overlays another. that may cancel out signals. This requires knowledge of the technology and careful alignment.
3. RFID tags are typically affixed to the inside back cover and are exposed for removal. This means that there would be problems when users become more familiar with the role of tags.
4. Another problem with RFID is reader collision and tag collision. Reader collision occurs when the signal from two or more readers overlap: The tag is unable to respond to simultaneous queries. System must be carefully set up to avoid this problem. Tag collision occurs when many tags are present in a small area, but since the read time is very fast, it is easier for vendors to develop system that ensure that tags respond one at a time.

6.0 Conclusion:

It is clear from the above discussion that RFID technology is used in the library mainly for theft detection purpose. This technology claims almost 100% security to library materials. So every modern library should use this technology. For this, it is important to educate library staff as well as library users about this technology.

7.0 Reference:

1. www.galecia.com/weblo/mt/archives/cat-rfidandwireless.php
2. www.bibliotheca-rfid.com
3. www.ala.org/ala/pla/plapubs/technotes/rfidtechnology.htm
4. www.rfid-Library.com
5. Das, Dr Nabajyoti (2012), RFID technology:an emerging technology that is using in libraries. ACLA Bulletin,Vol 5 & 6, 53-59.
6. Gautam, Dr Chinamani (2013), Role of RFID technology in libraries. In: Libraries towards digital paradigm, edited by Dr M P Singh. 531 – 535.
7. Mittal, A. et al (2010), RFID; a complete security system for libraries. In: emerging technologies and changing dimension of libraries and information service, 327-331.