

Is RFID Right for Your Library?

Trevor A. Dawes

ABSTRACT. RFID technology is taking off in libraries at an increasingly rapid pace. Though there are few libraries employing this technology today, the benefits are great. The cost is still prohibitive however. This article discusses some of the benefits and drawbacks to RFID to provide information for librarians that will be useful when deciding if the technology should be employed. *[Article copies available for a fee from The Haworth Document Delivery Service: 1-800-HAWORTH. E-mail address: <docdelivery@haworthpress.com> Website: <<http://www.HaworthPress.com>> © 2004 by The Haworth Press, Inc. All rights reserved.]*

KEYWORDS. Privacy, Radio Frequency Identification (RFID), security of library collections

Radio Frequency Identification (RFID) technology is rapidly being embraced by the library world as a resource that will aid in many areas. By one estimate, there are currently over 300 libraries worldwide with this technology already in use, and growth is expected at a projected rate of 30 percent per year through 2006 (Dawes and Anderson 2004). Indeed, the benefits of RFID technology, some of which will be discussed in this article, are great. In addition to cost savings over time, there can be benefits of increased speed in patron self-service, greater inventory management and control, and better security control over the library collections. There are still some drawbacks to this new technology, however, not the least of which is initial cost.

Trevor A. Dawes is Circulation Services Director, Princeton University Library, Princeton, NJ (E-mail: tdawes@Princeton.edu).

Journal of Access Services, Vol. 2(4) 2004
<http://www.haworthpress.com/web/JAS>
© 2004 by The Haworth Press, Inc. All rights reserved.
Digital Object Identifier: 10.1300/J204v02n04_02

Radio Frequency Identification combines radio frequency and microchip technologies to create a smart system that can be used to identify, secure and inventory items. The technology was developed in the 1980s, primarily for use in the industrial sector. Today, large retailers such as Wal-Mart are investing heavily in this new technology in the hope of saving billions of dollars in inventory costs (Gilbert 2004, online). With such a system in place, retailers can more easily identify and track their millions of cases of inventory electronically. The retail industry can see the benefits of RFID almost immediately by giving easy access to inventory management. While RFID systems may work for Wal-Mart and other retailers, before making the investment, librarians should ask what benefits will it bring to their library environment?

HOW DOES RFID WORK?

For the library to employ this technology, each item in the collection must first be “tagged.” The RFID tag is a special label, a transponder, containing a microchip and an antenna, which allows communication with the RFID reader that, in turn, communicates with the library’s integrated library system (ILS). The tag will have at minimum some information about the item such as the barcode. Most RFID vendors supply programmable tags, allowing the library to add brief bibliographic or other information to the tag, as desired.

Tagging the items in the library requires a process of conversion. In this process, the tag in the item is associated with the already existing item barcode. The library may also choose to add more information to the tag, though, for privacy reasons as well as to increase processing speed, including speed at check out and security control, this is not generally recommended. The conversion process requires very little training for staff, and conservative estimates based on this author’s conversation with several vendors suggest that a minimum of 200 items may be converted per hour.

RFID tags can be read through the item in which they are placed so there is no need to open the book in order to check it out, as has to be done with barcoded items. These tags allow for easier circulation transactions as, unlike barcodes, they can be read from a distance ranging generally up to three feet. Circulation functionality may be achieved from either a self-check unit, from which the tags of several items may be read simultaneously, or from a circulation desk. This tag may also communicate with the library security gates’ sensors via a security bit

embedded in the chip. If the item is not checked out, the security bit will be set to “on,” setting off the alarm if an attempt is made to remove the item from the library. This type of security can be best likened to that in commercial retail outlets. It should be noted that the RFID security system requires new security equipment, as they will not work with the electromagnetic (tattle tape) systems that can be found in most libraries today.

WHY USE RFID IN LIBRARIES?

Enhanced Circulation Capabilities

RFID can greatly reduce the amount of time required to perform basic circulation transactions. A fully tagged collection can allow the user to use the self-check option, and if available, the self-return option that may contain an optional sorting unit. Because the RFID tags can be read through the item, and also utilizes an “anti-collision” feature, many items may simultaneously be checked out. The anti-collision feature prevents the information stored on the tag of one item from being mistaken with that of another. The systems can generally process about four to six items at a time. In addition to checking out the items, if the security component is active, the security bit will be turned off and the item is recognized as checked out and will not set off an alarm when leaving the library building. This transaction may occur at a self-check station or at the circulation desk. If performed at the circulation desk, it reduces the number of repetitive steps involved in the transaction, such as scanning the barcode and desensitizing each book.

As this circulation process requires less physical handling of the material, there may be positive implications for use with archival or special materials. Some systems are equipped with a self-return unit as well, and this unit may have an optional sorter. If purchased, and if the library location information is stored on the tag, the sorter will enable the users to return items at any time to the designated area(s), and the system will do the initial sorting of returned items.

Better Inventory Control

Libraries may also benefit from RFID technology through enhanced inventory control. With the aid of a portable hand-held reader/scanner, a library staff member may examine a particular stack section and deter-

mine if items are either missing or out of place. This task can be accomplished without the need to tip or remove the item from the shelf.

Reliability

All vendors of RFID products will tout the reliability of their product. This reliability can be achieved because of the relatively short read range of the tags. The tags operate on a 13.56 MHz frequency, allowing a read range of up to three feet. This is a significantly lower frequency than the tags used in the retail sector. The shorter read range helps to protect the privacy of those with tagged items, as one would need to be within that specified range to read the tags. This range, however, allows the library staff or user to imprecisely place the items on the circulation unit to check out items. Again, unlike with barcodes, the items do not have to be in a particular place or order to be scanned and processed.

With RFID in place, staff may be freed to work on other tasks in the library, including assisting patrons with the self-check units. The technology also has the potential to lower the risk of repetitive motion injuries as staff are no longer required to open the item, scan the barcode and desensitize the item. What would have been a three-step process can now be achieved in one step.

AREAS OF CONCERN WITH RFID

Cost

The biggest hurdle to implementing RFID technology in any library is the cost. Richard Boss, in his report on RFID technology, details the cost of the technology for a small library. By his calculation, a library with a collection of 250,000 volumes would need to make an initial investment of \$333,500 to implement RFID (Boss 2003, 39:6-58). Although some of the equipment costs involved would remain the same for larger libraries, the price of the tags still represents the major investment. Depending on the volume, the price of the tags range from \$0.60-\$0.90. A large academic research library with five million volumes could expect therefore to spend a minimum of \$3,000,000 on initial tags alone. This is not an insignificant expense. In some libraries, grants have aided in the RFID implementation costs (Lichtenberg 2003, 250:14).

Tag Visibility

Like the barcode, the RFID tag is highly visible, and can be removed by distrusting library patrons. One vendor suggests using RFID in conjunction with the traditional electromagnetic security systems, but even that vendor has now entered the “one-tag” security embedded chip. Similarly, common household items such as aluminum foil may compromise effectiveness of the tags. Libraries should attempt to assess the risk of these factors in light of the risks currently faced with barcoded items.

Exit Sensor Readability

This is an area where some of the vendors disagree somewhat. Some recommend an exit gate width of three feet, and others suggest that four feet would suffice. All would agree, however, that the smaller distance would be ideal. Exit sensors must read the tags at a greater distance (An Overview of RFID 2003, 39:7-17). This requirement could result in fewer reads of the tags based on the relatively short read range. Libraries have not yet provided any statistics on collection loss rate pre- and post-RFID implementation.

Standards

There is currently a standard for RFID tags used in the retail or industrial sector. All vendors tags currently conform to the ISO 15693 standard—designed for the transportation industry—and will soon support also the ISO 18000 standard—designed for inventory control (Dorman 2002, 33:76-76). The conformance to these standards by the vendors, however, is voluntary. There is no library standard, and vendors are not likely to take the lead in developing one. The potential downside to this lack of a library standard is the interoperability of the tags with different systems. Libraries investigating RFID systems will want to ensure the ISO 18000 standard but will also want to make sure that the selected vendors tags are programmable. Programmable tags have a greater likelihood of working with other vendors’ systems should it become necessary for a library to do so. Standards do exist for the transfer of data from the RFID system to the library’s ILS, and all vendors meet this NISO standard.

Privacy

Much of the literature on RFID technology in libraries raises some concern about privacy (Oder 2003, 128:19-20; RFID Raises Questions 2004, 53:91-92). These concerns, though not unfounded, are somewhat exaggerated. There is little threat to patron privacy as there is no information about patrons stored on the tag. The tag will contain as much or as little information about the item as the library chooses. Most vendors will recommend only the barcode information, although if the library will use the sorting feature, some location and possibly call number information may be added. Like the barcode, the RFID tag itself is meaningless.

There is a general belief that, "Anyone with a handheld wand will be able to scope out that copy of *The Anarchist Cookbook* in your book bag. Perhaps it will be an airport screener, who may then ask you to step out of line" (RFID Raises Questions 2004, 53:91-92). This scenario will only be possible if the tag contains bibliographic information about the item and if the scanner is within the specified read range of three feet.

The deluge of literature on this topic suggests that there needs to be more education surrounding privacy issues and RFID. Librarians, as educators, should take an active role in this process as we seek to implement this technology.

RFID AND YOUR LIBRARY

RFID technology is still relatively new to libraries, but there is a wealth of experience with the product in the retail and industrial sectors. Libraries, in making a decision to implement RFID, will need to consider the advantages of circulation speed, better inventory control, and returns with sorting capability. The shortfalls also need to be weighed: cost, lack of standards, and privacy concerns.

There are several companies that provide RFID for libraries. Some of these are Bibliotheca, Checkpoint, ID Systems, Libramation, 3M, Tech Logic, Vernon, and VTLS. Libraries interested in RFID should be sure of the benefits this technology will bring to them. Does the library want to have increased patron self-service and better inventory control? Are the associated costs prohibitive? How will the library secure funding? What is the best system for the library? The November 2003 issue of *Library Technology Reports* provides guidelines for writing an RFP for

RFID. Libraries may wish to consult this guide as it also helps to clarify some decision points.

Ultimately, however, the library will need to perform its own cost-benefit analysis. What will RFID do for you? How will this benefit the patrons? The staff? The community? These are benefits that often cannot be measured.

REFERENCES

- An Overview of RFID. 2003. *Library Technology Reports* 39 (6): 7-17.
- RFID Raises Questions in SF, Other Libraries. 2004. *Newsletter on Intellectual Freedom* 53 (3): 91-92.
- Boss, Richard W. 2003. RFID Technology for Libraries. *Library Technology Reports* 39, (6): 6-58.
- Dawes, Trevor A. and Rebekah Anderson. 2004. Conversation with Rebekah Anderson, 3M Marketing Manager, 9 September.
- Dorman, David C. 2002. New Vendors Heating up Radio Frequency ID Market. *American Libraries* 33 (8): 76-76.
- Gilbert, Alorie. 2004. Oracle Joins Race to Bring RFID to Retailers. *CNET News.com*. 30 March: <http://news.com.com/2100-1012-5182178.html>.
- Lichtenberg, James. 2003. Industry Exploring Viability of RFID. *Publishers Weekly* 250 (46): 14.
- Oder, Norman. 2003. RFID Use Raises Privacy Concerns. *Library Journal* 128 (19): 19-20.

Received: 10/04/04

Revised: 10/12/04

Accepted: 10/13/04