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A Smart Approach to RFID Technologies

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Smarter Libraries through Technology

by Marshall Breeding

A Smart Approach to RFID Technologies

Radio Frequency Identification (RFID)-based technologies have grown into a major portion of the library automation landscape. While this topic has not been covered extensively in *Smart Libraries Newsletter*, RFID increasingly warrants attention. Not only are larger numbers of libraries investigating and adopting RFID products, but there are important conversations taking place regarding new standards and issues of interoperability with existing technology infrastructure components. This topic has been on my mind as I prepare for my keynote presentation at the CLIP RFID Conference to be held in London in November (http://www.cilip.org.uk/rfid2010/).

In the current economic climate, libraries struggle to maintain budgets in a difficult economy, the efficiencies and innovation made possible through RFID-based technologies can be an important aspect of a library's technology strategy. Though not necessarily a panacea for all libraries, it's an area of technology of increasing significance with an ever-expanding reach. RFID-based technologies today fit best into public libraries with moderate to high circulation volumes. Many academic libraries, especially those that serve large undergraduate populations, also experience the need to leverage technology to handle physical collections more efficiently. For these kinds of libraries, investments in technology can lead to improvements in service to patrons through more efficient handling of routine tasks related to physical materials. These investments give librarians and other staff more time to focus on providing services of higher value. Librarians should be careful to avoid the patterns we often seen in retail outlets with self-service, where too few personnel remain to deliver high-quality customer service.

RFID lends itself to more sophisticated automation of the process of handling library materials, to a degree that is not possible with conventional barcodes. Compared to barcodes, RFID offers several important advantages, including the ability to identify an item in close proximity without the need to find or touch the actual tag and the capacity to store the status of the item along with its identifier or other data. These characteristics enable many forms of automation related to self-check, returns with automatic sorting, as well as security systems that sound an alarm at an exit gate for materials not allowed to leave the library, such as reference materials or items from the circulating collection not properly charged out.

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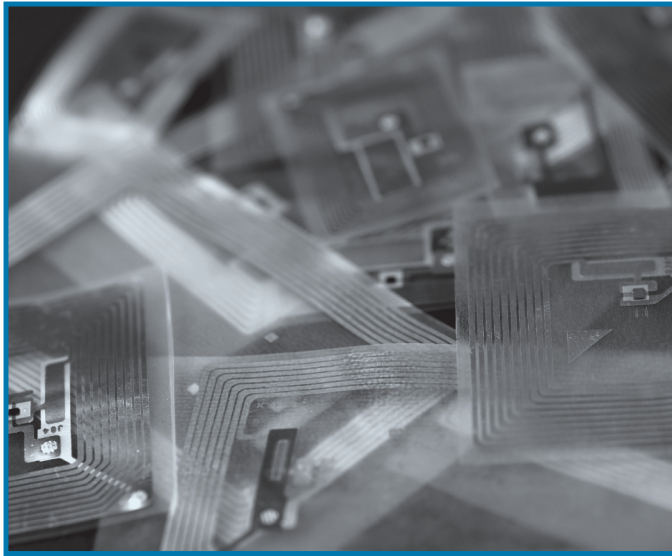
Academic or research libraries with large collections and lower circulation volumes may not find sufficient benefits to justify the expenses involved with converting to RFID from barcodes.

Academic or research libraries with large collections and lower circulation volumes may not find sufficient benefits to justify the expenses involved with converting to RFID from barcodes. Some research libraries have made use of RFID with selective parts of their operations, but I'm not aware of any with multi-million volume collections that have performed a wholesale conversion. As I do more research on RFID deployments, I'll be interested to learn about the libraries with the largest collections that have fully tagged their collection.

I think that public libraries have a long future with physical books and will continue to need strong automation support like that provided by RFID. Sure, ever higher proportions of their collections will come in digital form, but I think that it's a long way into the future that the typical public library will see a huge impact on its need to handle physical materials. I think that media lending will see changes first. Lending CDs and DVDs represents a large portion of a typical public library's circulation activity. Given the rapid shift away from publishing on physical media in favor of streaming delivery, one of the most pressing issues for libraries today involves finding ways to remain relevant through this critical transition.

I should also point out that many libraries implement functions such as self-check and automated materials handling without RFID. These functions can also work with conventional barcodes. King County Library System, featured in this issue for its Evergreen implementation, operates a large-scale self-check and and automated return and sorting systems using barcodes.

This arena of RFID-based products raises a variety of ques-

tions related to standards and interoperability. Some relate directly to the technology itself. The technology is beneficial if the tags employed by one library can be read by its peers and partners, especially by those mutually involved in resource sharing or inter-library loan. Libraries also want to avoid proprietary solutions that lock them into a single vendor. They prefer to have the ability to acquire equipment form different suppliers without having to re-tag their collection. We also need standards that will ensure that the tags used today will continue to be supported through multiple cycles of equipment replacement. Since RFID tags rely on computer chips which naturally turn through technology cycles very quickly, we need to know that those that we buy today won't be phased out as obsolescent, but will endure for reasonably long periods. Given that RFID finds use in many different industries, some standards apply very broadly, with profiles and best practices developed to address library use specifically.

I'm especially interested in the issues of interoperability among the different components of a library's technology infrastructure. In the present stage of library automation, we're seeing the integrated library system become increasingly decoupled from front-end discovery interfaces, connected through applicable standard protocols or APIs. As libraries implement RFID equipment, we also face the need for interoperability with the core ILS, mostly using protocols such as SIP2 or NCIP. Yet, the functionality addressed by these protocols is limited and efforts are underway to modernize how these systems interoperate using Web services and to extend the vocabulary of supported features and functions.

As with any other technology product, investment decisions must take into consideration a total cost of ownership that considers all expenses though many years of use. These calculations can be especially critical when evaluating strategies involving potential reductions of personnel versus efficiencies gained through RFID-based technologies.

The obvious cost components of an RFID implementation include the initial cost of equipment such as self-check stations for patrons, equipment needed at the circulation desk; return stations, sorting systems, the cost for the RFID tags for each item and personnel costs for installing tags. Ongoing costs will include service

contracts on equipment. As with all other technology products, upgrade or replacement costs must be factored into the long-term budget. With RFID implementations, new generations of equipment and tags that warrant new investments may become available over time.

I expect that RFID will become a larger portion of the library technology sector, initially in routine functions such as self-check and processing of returned materials, but eventually in other areas that will tap the potential of the technology to offer more innovative services to library patrons. Self check and automated materials handling improve the efficiency of traditional operations. The challenge lies in using the technology in ways that go beyond perceptions of reducing labor costs, but in delivering new services that library patrons will value.

When looking at the library automation industry broadly, we can expect RFID technologies to represent a growing opportunity. Sales for new ILS products once dominated the industry. As the ILS market became increasingly saturated and presented limited opportunities for new business, we've seen many companies become involved with new discovery products. Given the growing importance of RFID-based products, I expect to spend more time researching issues relating to the technologies involved and providing more coverage in this newsletter.

Library Automation at the State-Wide Scale

Computing platforms available today can scale almost infinitely, removing technical limits that previously may have constrained the number of libraries that can share common infrastructure, such as an integrated library system. Municipal or county library systems and regional consortia routinely share an ILS. Recently, some libraries have begun to strive for state-wide sharing of library automation systems.

The state of Delaware recently achieved an important milestone in resource sharing through the completion of a project to bring all of the public libraries in the state under a single automation system. The Delaware Library Catalog, based on a shared SirsiDynix Symphony ILS, provides the automation infrastructure supporting a multi-type consortium of throughout the state spanning 52 facilities, including public, academic, school, and special libraries. This consortial ILS has been in place for over 5 years, including most, but not all the public libraries in Delaware. In recent months the remaining 13 libraries joined in, most moving from independent Sirsi-Dynix Horizon systems. The consortium also includes the four campuses of Delaware Technical and Community College,

Wesley College, and the University of Wilmington, which also has four campus libraries. Richard James, the Administrative Librarian for the Delaware Division of Libraries, headed the effort to migrate the remaining libraries.

This project stands out in that it provides a comprehensive statewide automation environment for public libraries, each under the control of its local government. The Delaware Library Catalog is a true consortium of public and other libraries, though it is managed by the Delaware Department of Libraries. Though Delaware, with a population of less than one million, is a very small state (45th out of 50), bringing all of its public libraries, plus others, into a single shared system stands as a major accomplishment. Vermont, by contrast ranks 49th in population, and has over 60 separate ILS implementations in operation, and as many as 100 libraries with no automation.

Comprehensive statewide library automation is not unprecedented. All of the fifty-one public libraries in Hawaii, for example, are all part of the centrally managed Hawaii State Public Library System, which has been in place since 1983. Hawaii has carried this statewide system through multiple generations of ILS products, beginning with a Ulisys system, and moving through Dynix and DRA, and now sharing a SirsiDynix Horizon ILS.

The WYLDCAT, the Wyoming Libraries Database, shares a SirsiDynix Symphony ILS among over 100 libraries in the state, including all 23 county library systems, as well as several community colleges, school districts and special libraries. This automation project has been underway since its 1983 implementation of a GLIS system from Geac, replaced by a system from DRA in the mid 1990s, and onto its current platform in 2002.

In Rhode Island, all 50 public library systems participate in Ocean State Libraries, sharing a Millennium ILS from Innovative Interfaces.

Other projects are underway that aim toward state-wide scope. The PINES consortium in Georgia, for example, serves 282 libraries with the open source Evergreen ILS it developed. PINES does not include many of the population centers of the state, including Atlanta - Fulton County, Cobb County, DeKalb County, and others. In Canada, British Columbia is working toward a province-wide implementation of Evergreen, with 66

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out of 252 libraries currently participating.

A more nascent statewide effort was recently announced in Pennsylvania. An initial group of libraries participating in a shared Millennium ILS hosted by HSLC, will migrate to Evergreen with a VuFind discovery layer later in 2010, paving the way for additional migrations in the coming years. Though the project has ambitions toward statewide participation, its success will depend on attracting independent library systems to shift from other systems.

As libraries plan strategies for automation, it's interesting to consider the practical limits of shared automation systems. Here in the United States, we can see several examples of sharing at the state-wide level. We see some longstanding projects, some emerging only recently, and spanning organizational configurations from centralized to consortia of independent libraries, some multi-type and some homogeneous. Most of these projects are based on proprietary ILS products, though recent efforts rely on open source software.

—Marshall Breeding

King County goes Live with Evergreen

The open source ILS movement reached a significant benchmark with the implementation of Evergreen in the King County Library System, the second busiest library system in the United States in terms of circulation activity. Located in the suburban areas surrounding Seattle, WA, KCLS includes 46 branches circulating over 21 million items annually.

King County has been investing the possibility of implementing Evergreen for over three years. In March 2007 KCLS engaged Equinox Software (http://www.esilibrary.com) to perform a variety of services, including installation of an instance of Evergreen for testing and evaluation, data migration, customization, and other activities. To meet the requirements of KCLS, a number of new features were developed for Evergreen, which have been contributed back according to the principles of open source. Many of these features will appear in Evergreen Version 2.0, currently in Alpha release. Galecia Group

(http://www.galecia.com) will also provide consulting services for the project.

The KCLS implementation of Evergreen included a customized end-user interface, or skin, that delivers a unique appearance and different aspects of functionality from the standard distribution of Evergreen. The user interface development was contracted to FGI, a consulting firm based in nearby Kirkland, WA (http://www.fgi.com) working closely with the library's Web Services Department. The coding involved with the interface work will also be open source and available to other libraries that use Evergreen.

One of the challenges of implementing Evergreen involved interfacing with the self-check and automated materials handling systems installed in many of the KCLS facilities. Provided by Lyngsoe Systems Inc. (http://www.lyngsoesystems .com), the AMH systems work with traditional barcodes rather

than RFID tags, and communicate with the ILS via SIP2 protocol. KCLS also makes use of over 250 self-check stations throughout its 46 branches. The library designed and assembles its own self-check stations. An important part of the project involved creating open source self-check software for Evergreen.

Evergreen was phased into production between October 1st and 4th, 2010. The completion of this migration marks a milestone in the progression of open source ILS, demonstrating an ability to handle a large and busy suburban library system. Other Evergreen installations manage large numbers of smaller libraries, but have not yet been adopted by a library system with the more strenuous requirements of KCLS. The library is migrating from a Millennium ILS from Innovative Interfaces installed in 2004.

King County has also spearheaded initiatives to pave the way for the adoption of open source automation software by other libraries. As reported in the November 2009 issue of SLN, IMLS awarded KCLS a National Leadership Grant of $998,556 for the development of non-technical infrastructure, such as documentation and support channels, to facilitate libraries in adopting open source ILS. King County and other library partners committed in-kind resources of over $1 million as matching requirements to the grant.

According to Jed Moffitt, Director for Information Technology Services, the transition went as smoothly as could be expected. Library operations continued relatively normally after the transition to Evergreen without significant down time. The initial response times delivered by the new Evergreen system were a bit sluggish. Technical changes introduced in subsequent days brought improvements to around three seconds per transaction, with work underway
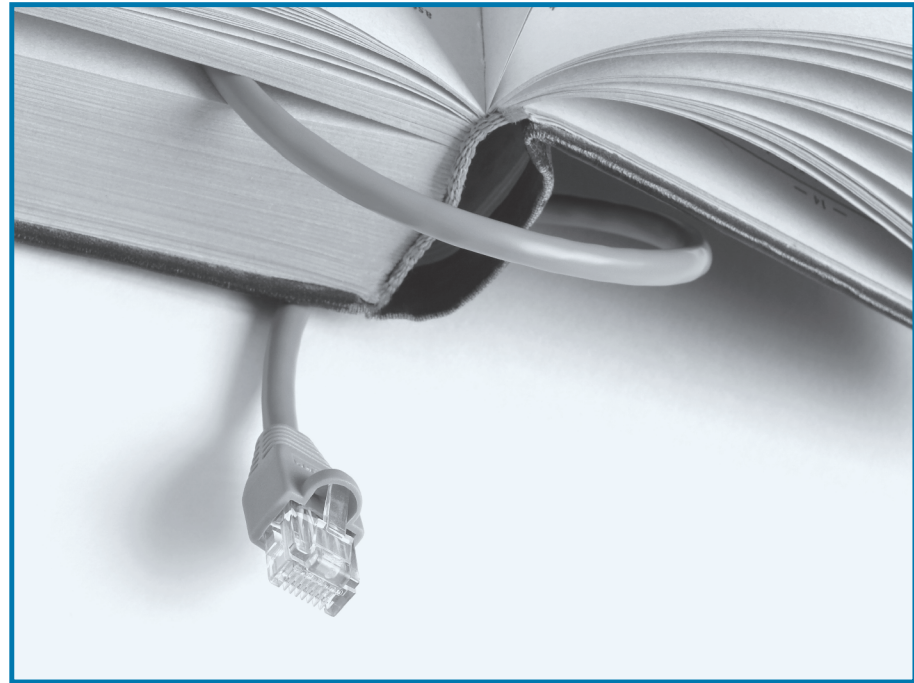
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to meet the target specifications of less than two seconds per transaction. Work continues to make further improvements in performance. Moffitt reported that initial customer reactions have been mixed, though with a slant toward the critical. Many of the comments submitted by patrons in the first days of the transition questioned when specific features to which they had been accustomed would return. Some comments praised the new look of the catalog; some complained of slowness. The prevailing approach in the implementation process was to launch the new system with all the basics in place and quickly address any issues that surface

afterwards rather than attempting to anticipate all possible problems before going forward. Overall, Moffitt characterizes the migration as successful, though much work remains.

In the conservative automation arena where many libraries prefer to hold back until a given product or trend has been implemented successfully by others with similar or more complex circumstances, the implementation of Evergreen stands as an important catalyst to further momentum of open source ILS in general and Evergreen in particular.

—*Marshall Breeding*

Executive Changes in the Industry

Ex Libris Group announced major changes in the executive leadership of its North American division. Carl Grant, named President of Ex Libris North America in July 2008, shifts to a new role, that of Chief Librarian for the global company. Grant's new position includes strategic leadership and guidance for the company as a whole, with influence beyond the North American division. As the company's Chief Librarian, Grant will promote the values of the profession both internally, to its customers, and throughout the broader industry. This role leverages Grant's deep experience as an industry veteran, having held executive positions in many automation companies, and his passionate advocacy of the value of libraries and librarians.

Mark Triest joins the company, stepping into the position of President of Ex Libris North America. His 20 years of IT experience includes roles as Senior Vice President at Sunguard, and most recently as President of Inigral (http://inigral.com/), a company offering a service that builds Facebook communities for institutions of higher education. Triest takes responsibility for the operations of Ex Libris North America as Grant assumes a more strategic focus.

Over at **Innovative Interfaces**, Hilary Newman has been promoted to to Vice President of Library Services. This division of Innovative Interfaces includes technology support, Encore Services, implementation services, technology support, union database services, with personnel in North America, Europe, and Asia. Newman's new assignment falls within the tendency in this company to promote from within and follows a series of upward shifts beginning with the August 2010 appointment of Neil Block as the company's new President.

OCLC announced major executive changes in its Europe, the Middle East and Africa (EMEA) division. Rein van Charldorp, will retire as Managing Director of this division effective the end of 2010. Van Chaldorp joined OCLC PICA in 2002 with prior experience at Reed Elsevier. Eric van Lubeek, currently Director of Sales and Operations for this division will assume the role of Managing Director. Van Lubeek served as the General Manager of Infor Library Systems, previously called Geac, before joining OCLC PICA in January 2007.

—*Marshall Breeding*

Interacting with Digital Natives

How would an anthropologist describe digital natives? They are young, they speak in text messages, and they are armed with increasingly mainstream digital devices such as iPhones, iPads, Nooks and Kindles. Some have been known to hear ringtones barely audible to non-natives. They live very publicly in the fish bowl of social media. They have already infiltrated a school or workplace near you, and scores more are on the way. Are you ready?

In the past decade, digital information has grown at an unprecedented rate. Digital natives access information in a way that is fundamentally different than previous generations. They have grown up with fast and convenient access to information on just about everything. You need to look no further than the iPhone App Store to get a glimpse of how they use and interact with data.

Digital natives are highly active users of content, not passive. They publicly voice their opinions by commenting on blogs, websites and social media channels. They are more likely

We've all evolved to take advantage of digital assets. We now bank, shop, get directions, plan vacations and complete endless tasks online. To provide meaningful service, organizations must talk to their customers, track and analyze trends to quickly adapt, regardless of what industry they are in.

to get news from the articles their peers post online than by watching it on TV or reading a print newspaper.

We've all evolved to take advantage of digital assets. We now bank, shop, get directions, plan vacations and complete endless tasks online. To provide meaningful service,

organizations must talk to their customers, track and analyze trends to quickly adapt, regardless of what industry they are in. Academic, public and corporate libraries, at different times, have been in the lead of adopting online technology to satisfy their patrons and users. Digital content collections, for example, enable libraries to provide cost-effective information and expose patrons to a wide range of content that may not have been feasible to offer previously. What's next?

As content is commoditized, interactivity has an increased role in the value chain. For example, having access to your bank account online is one thing. The value lies in what you are able to do with the account information. The ability to transfer money, pay bills, download statements and view charts and graphs to analyze spending habits has much greater value than simply reading a balance. When you shop online, you can read consumer reports, view your preferred color of an item, chat with customer service representatives via Instant Message (IM), receive notices about discounts and track delivery of a purchase. These are just a few examples of how consumers regularly interact with information. Similarly, we expect more interactivity in business and, more importantly, education.

Interactive content is an asset of great benefit to professors and their students, and the learning curve for using it is very short, particularly for digital natives. Professors use interactive content as part of their arsenal of teaching tools to provide students with a wide array of problems to solve. Professors encourage students to use multiple sources so they can check their understanding of materials and create a deeper knowledge of core principles. For engineering students, no single calculation is enough – it's necessary to compare and validate results using multiple sources and methods.

Knovel, for example, offers interactive, online technical reference information to engineers at best-in-class companies and academic institutions worldwide. Working with Cengage Learning, Knovel recently added a set of problems in each chapter of the 6th edition of "The Science and Engineering of Materials" by Askeland, Fulay and Wright. The problem and solution sets are also available on the textbook's website, with solutions accessible to professors only. These problems require students to find answers using a variety of sources and interactive tools available via Knovel. For example, a student would be asked to "describe the problems associated with metal impurities in silicon devices." The answer to this includes material not covered in the textbook. As a result, students learn to use Knovel and its interactive tools as a resource for coursework, while expanding their knowledge.

There are several advantages to interactive content. Interactivity:

- Supports a granular, sophisticated search that enables users to quickly find information that would be difficult to locate in static content alone;

- Allows users to interpolate information by plotting data on malleable graphs;
- Enables customized results that help students to develop a better understanding of the relationship between conditions and the property of materials, for example.

As another semester approaches, students seek what's hot on campus. Whether it be classes, resources and tools, they're always looking for appealing options that offer a leg up on the competition as they prepare for the workforce. Information has always been a powerful asset. Modern libraries and librarians who find ways to offer information in fresh, interactive ways will stay in tune with the needs of the new class of digital natives.

—*Delores Meglio*

Delores Meglio is Knovel's Vice President of Publisher Relations, where she is responsible for guiding content selection, licensing, and production. Meglio is a graduate of City College of New York and holds a Masters Degree in Information Science from St. John's University.