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In 2008 Grand Valley State University Libraries began a large weeding project in the automated retrieval system (ARS) at its Steelcase Library. An estimated 19,000 volumes were to be removed from the ARS. A systematic weeding of the ARS had never been undertaken and it presented a number of logistical challenges. This article discusses the system that was devised for this large weeding project.

KEYWORDS ARS, ASRS, automated retrieval system, automated storage and retrieval system, weeding, academic libraries, collection management

THE AUTOMATED RETRIEVAL SYSTEM

Grand Valley State University's (GVSU's) DeVos Campus in downtown Grand Rapids, Michigan opened in 2000. One of its signature features is the Steelcase Library which contains a traditional library and an automated retrieval system (ARS). Its classical reading room houses the general reference collection while the ARS stores the circulating collection and a significant portion of the legal reference collection. The Steelcase Library serves the needs of GVSU's professional programs (business, legal studies, criminal justice, public and non-profit administration, social work, philanthropy, education, and hospitality and tourism management).

At the time of its installation in 2000, there were only two other similar retrieval systems (also known as automated or automatic storage and retrieval systems (ASRS)) in use in U.S. libraries. GVSU's system, designed by Rapistan Systems of Grand Rapids, holds up to 250,000 books and consists of 2,600 bins (2 x 4 feet) in a rack structure occupying a secure vault approximately 100 feet long, 15 feet wide, and 40 feet high. A robotic crane, manufactured by Rapistan's parent company, Mannesmann DeMag, in Wetter, Germany, extracts bins of up to 350 pounds and delivers them to one of three operator stations. The crane travels horizontally along its embedded floor rail at 230 meters per minute, and vertically at 80 meters per minute. Users browse and request books using the online catalog. When a request is made the ARS automatically locates and retrieves the item.

A short video of the Steelcase ARS can be viewed at iTunes U, Grand Valley State University, GVSU University Libraries: *http://itunes.apple.com/WebObjects/MZStore.woa/wa/viewPodcast?id=386256586*

The ARS stores and retrieves materials by bar code not by call number or subject matter. Materials are assigned to bins based on their size. Consequently, bin space created by a book on loan is filled by a returned book of appropriate size, regardless of that book's content. Any given bin contains a mix of items by subject matter and call numbers.

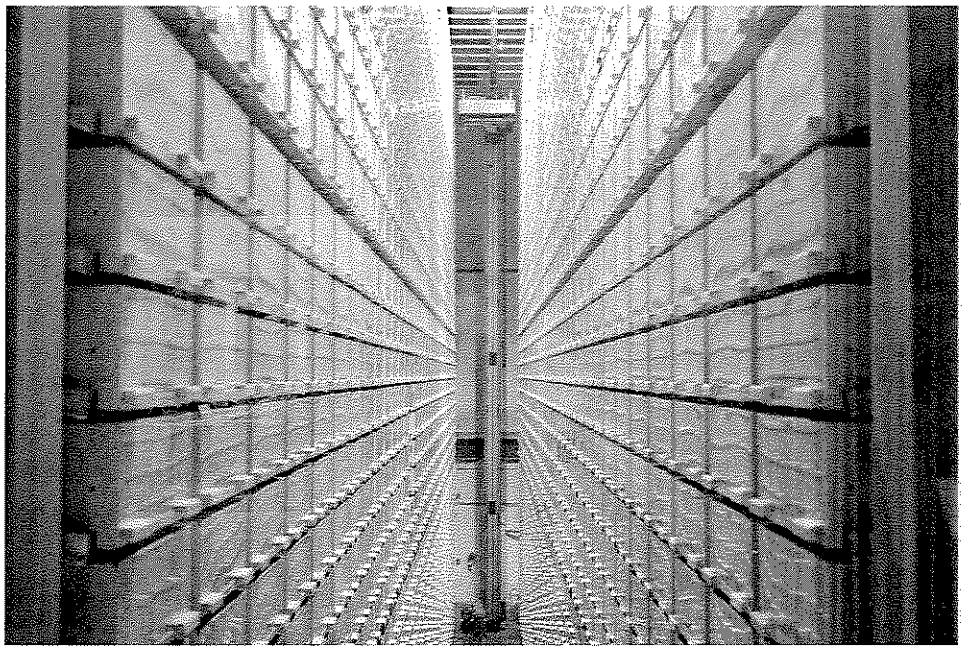

Figure 1 Photo of Steelcase Library ARS by Amanda Pitts

Materials in an ARS are essentially invisible. Items are placed in the large metal bins and those bins are stored on racks within the multistory vault. The only way to retrieve an individual item from within the bins is via the crane after it has been requested through the library's online catalog. When an item is requested the entire bin is delivered to an operator station where staff removes the item from the bin. An item cannot be physically retrieved from a bin in any other way. Consequently items can only be retrieved on an item-by-item basis. Theoretically one could remove more than one item from any given bin once that bin has been recalled to an operator station. However, since the items are stored randomly in the bins, this is not an efficient method of retrieval.

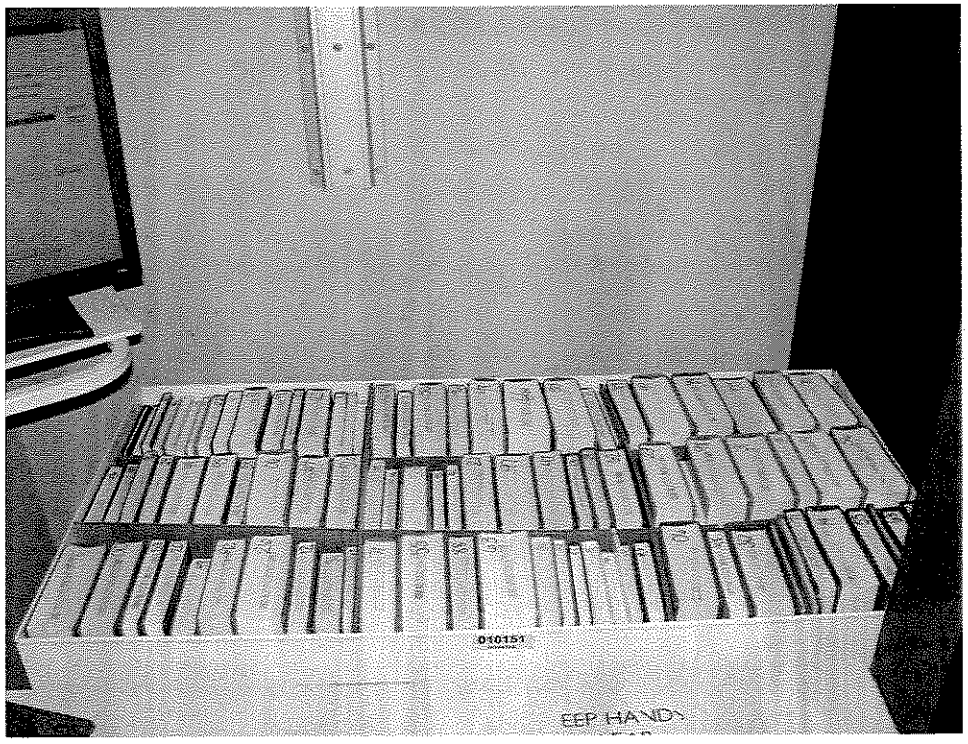

Figure 2 Photo of Steelcase Library ARS Bin by Karen Martin

This arrangement of materials in an ARS is vastly different than in libraries that use traditional library shelving. One cannot simply review a shelf of physical books or materials in an ARS. In the Steelcase Library bins do not contain call number runs or specific subject matter. Even if one were inclined to review a bin looking for books on a particular subject, books are tightly stored in each bin, spine to the back of the bin, bottom edge up. Other than a two digit identification number written on the bottom edge of every book and the libraries' identification stamp, there are no other identifying marks of any kind. Titles and call numbers are not visible. Each book would have to be pulled out and examined to determine its subject matter.

LITERATURE REVIEW

Automated storage and retrieval systems are "a combination of equipment and controls that handle, store and retrieve materials as needed with precision, accuracy and speed

under a defined degree of automation" (Material Handling Industry of America 2011, http://www.mhia.org/industrygroups/as-rs). They are commonly used as warehousing systems for storage and retrieval of products, and the literature indicates that ARS have been in operation at least since the 1960s (Roodbergen and Vis 2009; Kulwiec 2007). Savings in labor costs and floor space, security, and reliability have been cited as advantages of automated retrieval systems. (Roodbergen and Vis 2009).

The first academic library ARS was installed in 1991 at the California State University Northridge's Oviatt Library. That, and the second academic library ARS at Eastern Michigan University, are used to house infrequently used books and periodicals (Haslam et al. 2002). When it was installed in 2000, the ARS at GVSU was the only automated retrieval system that was used to hold a circulating collection. Although several other automated retrieval systems were built since 2000, some of which are used to store active collections, there is nothing in the literature that specifically addresses the management and/or weeding of active collections in an ARS.

The limited literature on the subject of library automated retrieval systems focuses on the planning necessary for preparing a collection for moving it into an ARS (Kim and Popma 2007; Amrhein and Resetar 2004; Mathisen 2005) and the impact of the ARS on patron services (Shirato, Cogan and Yee 2001; Parker 2003). Haslam et al. (2002) described the process of planning for and implementing the ARS at the Lied Library at the University of Nevada, Las Vegas. In 2005 an article extolling the success of the ARS was published (Haslam 2005).

A literature review on weeding an ARS was conducted prior to undertaking this project. We found that there is literature regarding organizing and executing weeding

projects in academic libraries (Handis 2007; Dubicki 2008), but nothing specific to weeding a collection stored in an ARS. Weeding a collection stored in an ARS is a much more complicated process than is weeding books on open shelving. The purpose of this article is to address the unique challenges that weeding an ARS presents.

THE LAW COLLECTION

The Steelcase Library was designed to accommodate GVSU's 3,000-volume law collection and other collections supporting academic programs at the downtown campus. These collections were previously housed in the university's crowded main library in Allendale. While the Steelcase Library was being built, the Grand Rapids Bar Association (GRBA) was seeking a location for its 35,000-volume law collection. The Steelcase Library was a logical choice as it was the only public university in the downtown Grand Rapids area. GVSU and the GRBA entered into an agreement where the GRBA collection would be transferred and housed at the new library. GVSU agreed to assume full responsibility for the collection, allowing GRBA members access to it in addition to providing reference services. In 2000, the two law collections were consolidated in the new Steelcase Library. The combined collection far exceeded the planned shelf space for legal materials and the vast majority of the volumes were stored in the ARS. Some of the reporters, digests, and legal encyclopedias were shelved in the reading room.

The agreement required GVSU to accept the totality of the GRBA collection. There was some overlap in the two collections and much of that was eliminated but, for the most part, GVSU did not weed the GRBA collection after it was accepted. GVSU

then further supplemented the law collection by purchasing many additional law treatises and series.

In early 2007, based on declining use, GVSU and GRBA began to evaluate what had become a large and very expensive law collection and whether it should remain in the Steelcase Library. It was much larger than what was needed to support GVSU's programs and many of the titles GVSU owned and updated in print were being duplicated in online databases. GVSU and GRBA reached a new agreement that allowed the GVSU Libraries to begin significantly reducing the law collection. Approximately 300 subscriptions to law treaties and series held in the Steelcase Library were canceled and then GVSU and GRBA devised a plan to dispose of a large portion of the GRBA collection.

FIRST WEEDING

By this time, GRBA no longer had the physical space to house its former library nor the staff and resources to maintain it. It was decided that GVSU would offer any titles that it did not want to retain first to a local private law school library and then to members of the GRBA and local law firms. It was also agreed that GVSU could dispose of the remainder of the collection according to its weeding policies.

The following criteria were considered in determining whether particular material would be weeded from the law collection at GVSU:

1. Whether the material supported the curriculum of GVSU.

2. Whether the material was outdated, was no longer being updated, or had been superseded.

3. Whether the material was duplicated in another text or online service, or was a duplicate copy of a work already held by the library.

4. Whether the material was specifically requested by professors to be retained in both print and electronic form for teaching purposes, such as *Michigan Compiled Laws Annotated* and Michigan case law such as *Michigan Reports* and *Michigan Appeals Reports*.

4. Whether the material was considered an authoritative work.

5. Legal materials that met the criteria for weeding, but had historical value regarding Michigan law and lawyers, were to be sent to the university archivist for evaluation and possible retention in the university archives.

6. The degree to which the material fit the selection and retention criteria of this weeding policy.

When GRBA materials were added to GVSU's holdings, it was noted in each catalog record that the item was donated by GRBA. Using these records, technical services generated a list of titles originally donated by GRBA. This list was reviewed by GVSU librarians and faculty and any titles that were to be retained in GVSU's collection were removed from the list. This revised list was then circulated to the private law school library and GRBA members who were given first opportunity to take the books.

During the summer of 2008, the law school library and a number of law firms requested titles on the list. This was GVSU's first experience removing a significant number of volumes from the ARS during a limited time period. Shelving was designated in the library workroom for processing these books, the great majority of which were multi-volume sets. A system was developed for retrieving the volumes as requests for

titles were received. The librarian coordinating the project would recall one volume of the requested title from the ARS and place it on the designated shelving. As time permitted, circulation staff would pull every volume of a designated title from the ARS. This was often done in the evening or on weekends, when patron activity at the circulation desk was lowest. Circulation staff would then process the title by removing it from the catalog and OCLC records.

Theoretically, a book can be retrieved from the ARS in approximately one minute from start to finish. In actuality, it often takes longer based on several factors, including the number of pending requests and patron activity at the circulation desk. Even at the rate of one book per minute, it can take over three hours to retrieve a 200 volume set if every volume is in a different bin. The process of retrieving books for this weeding project was completely dependent on the availability of staff to pull the titles and shelf space availability in our storage area. After the requested books were pulled the requesting party was contacted and they made arrangements to pick up the books.

SECOND WEEDING

After the deadline for requesting books had passed, the second weeding of the collection began. The treatises became the next priority, as many had been canceled and were several years out of date. Technical services generated a list of canceled titles by call number. This list included titles donated by GRBA as well as titles purchased by GVSU. Using the procedure described above, the canceled titles were removed from the ARS. These first two weeding passes were accomplished in approximately six months and during this time over 14,000 volumes were removed from the Steelcase ARS.

During the second weeding, a problem arose that had not previously been considered. It is GVSU Library policy that discarded books be shredded and there was a small line item of in the Steelcase Library budget for this. However, the extra costs incurred from shredding such a large amount of material in a short time frame quickly exhausted the shredding budget. This slowed both the retrieval and disposal processes until additional funds were allocated. The cost for shredding the 14,000 volumes was approximately $3,500, seven times the original line item budget of $500.

SUBSEQUENT WEEDING

The process of weeding the rest of the law collection began once the requested and canceled titles were removed from the ARS. The remaining 5,000 volumes from the original GRBA list (none of which were selected by the law school library or any law firms) have been pulled and discarded using the same process described above as time and space permitted. The majority of these consist of out-of-date treatises and miscellaneous law books collected over a period of many years by GRBA.

FUTURE WEEDING

Without a list of titles or specific call numbers, and with no personal knowledge of the content of the original GVSU collection, weeding the rest of the collection stored in the ARS has begun. First a list of titles by call number was generated. The search was limited to the LC classification "K" and further limited to the Steelcase Library. The resulting list contained almost 9,000 titles in call number order.

Review of the titles on this list is ongoing. Sometimes a decision to retain or discard an item can be made based on its cataloging record alone, but usually an item must be retrieved from the ARS and physically reviewed before a final decision can be

made. Items for discard are handled in the same way as was described for the earlier weeding passes. This continues to be a cumbersome and time-consuming process.

Staff at the Steelcase library is resigned to the fact that not every outdated law title stored in the ARS will be identified. Not all relevant titles are in the "K" classification system. These types of books are often found when searching law related subject headings and keywords. Occasionally outdated titles are discovered when purchasing newer editions of the exact or similar titles. Circulation staff also notes outdated material found.

CONCLUSION

Weeding of the GRBA collection began just as a new legal resources librarian joined the GVSU library faculty. The dearth of knowledge regarding the collection made forming a complete picture of the law related holdings quite a challenge. Browsing catalog records was not nearly as efficient or informative as reviewing books on shelves. Compounding this was that the catalog records did not always contain enough information to facilitate judgment about content or currency and a title often had to be retrieved from the ARS for review.

The fact that one cannot browse the shelves and remove outdated and unwanted materials is one of the major shortcomings of an ARS. Not only is this true when undertaking a major weeding project but also for day-to-day weeding. This weeding project revealed many examples of other, older legal materials retained in the ARS that should have been weeded from the collection when new materials were purchased.

The main advantage of having an ARS is space savings and many university and college libraries are considering using them due to the tremendous increase in building

costs. GVSU is building a new library on its main campus in Allendale which will feature its second automated retrieval system. Based upon the experience of weeding the ARS at the Steelcase Library, it is recommended that any library planning to build and use an ARS consider the following:

1. Completely and aggressively weed collections before moving them into an ARS.

2. Anticipate future weeding needs by ensuring that cataloging records are complete and contain information necessary to isolate discrete collections if any exist. The list of GRBA materials would have been extremely difficult to re-create without the notations in the catalog records.

3. As part of a collection development program, develop procedures for weeding an ARS on a regular basis, including periodic review of the holdings in an ARS by call numbers and subject headings.

4. Examine the feasibility of programming an ARS to keep multi-volume sets in the same bin. In the system in place in the Steelcase Library, these sets can initially be loaded in one bin, but over the course of time, the volumes become separated within different bins. The more a set is used, the more likely the separation.

5. Consider carefully whether an ARS is the proper location for storage of multi-volume sets and high-use items.

Weeding an automated retrieval system presents unique challenges. Without the visual clues of overcrowded shelving or older editions, it is easy to allow an ARS to become filled with outdated and obsolete materials. Librarians with collections stored in

an ARS must be diligent in reviewing and weeding to ensure that the collections remain right-sized and current.

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