Out of Sight but Not Out of Mind

Preparing for an Automated Retrieval System

Taeock Kim and Paula J. Popma

As with many academic libraries of its generation, the University Library at Santa Clara University (Calif.) was running out of space and needed renovation to meet the needs of twenty-first-century students and faculty. To make necessary upgrades, the university embarked upon an ambitious capital campaign to raise $95 million for the construction of a new library and information commons. The board of trustees approved groundbreaking for summer 2006, with $55 million already raised and a strong commitment to raise the other $40 million. The plans called for the new building to occupy the same site as the old one, a unique situation that required special considerations.

Most libraries planning an automated retrieval system (ARS) as part of a new library building decide which portions of their collections will go into an ARS, and then load them after construction is completed.[1] Because the new building was designed to occupy the same site as the old one, the entire collection had to be prepared to be housed in an ARS prior to construction. Incorporated in the building plans was an ARS serving dual purposes: it functioned as both a holding area for library material in a convenient campus location during construction of the rest of the building and as a long-term storage facility for lesser-used items upon completion of the project. During construction of the new university library and commons, the ARS housed the university library's collections, while services were provided from an interim campus location in a temporary modular building and space in an unoccupied portion of the athletic building. Thus, with off-site storage not an option, library staff was challenged to prepare all collections for the ARS prior to demolition of the old building.

As the first phase of the building project, ARS construction began in October 2003 and was completed in January 2005. The ARS structure is located about ten feet behind the old library structure and eventually will be attached to the new building. It houses a total of 11,328 bins; each bin is 2' deep and 4' long, with 354 bins that are 18" high, 1,770 bins that are 14" high, and 9,204 bins that are 12" high. During construction of the new building, which is scheduled to be completed in September 2008, an online request triggers one of three cranes to travel down an aisle and retrieve the appropriate bin. Staff monitors the requests online and picks items from the ARS bins every thirty minutes. Items are delivered to the circulation desk, located in a temporary modular building.[2] An interface between HK Systems and Innovative had been developed previously and was already in use by Sonoma State University (Calif.) and University of Nevada, Las Vegas. Santa Clara University Library purchased and installed the interface relatively easily.

Team Planning

An ARS work group, composed of five staff representing functional areas within the library, was formed "to determine the processes that make the best use of staff time and resources in preparing materials to be housed in the ARS during the construction of the remainder of the new facility."[3] The group proceeded to survey the collections and analyzed what needed to be done to prepare them to be housed in the ARS, including drafting procedures, a timeline, and costs of staff, supplies, and equipment. The collection survey revealed that item records needed to be created and bar codes linked for 20,000 serial volumes, 160,000 bound journal volumes, 30,000 reference volumes, 9,000 government document volumes, 900 boxes of microcards, 25,000 volumes in special collections, and an unknown number of archival materials. Approximately 500,000 circulating volumes already had linked bar codes. Each one of these collections presented unique challenges.

Because the bar code number is the only mechanism for identifying a volume in the ARS, and all of the bar code labels were inside the volumes, the person retrieving volumes from a bin must manually match the bar code number on a request screen with that on the volume. Thus, the group sought to determine how to expedite this process. The initial recommendation was to write the last four digits of the bar code numbers on the top edge of the volumes with acid-free, non-toxic pens. Ultimately, though, the

Taeock Kim (tkim@scu.edu) is Associate University Librarian, University Library, Santa Clara University, California. **Paula J. Popma** (ppopma@csufresno.edu) is Assistant University Librarian, Technical Services, Henry Madden Library, California State University, Fresno.

decision was made to duplicate entire bar codes and place them on the outside back cover. Six bar code duplicators and hand-held scanners were purchased, a crew of student assistants was hired, and the duplication of 750,000 bar codes was completed in one year.

Once the ARS Work Group issued its report and recommendations, it was disbanded and replaced with an ARS Implementation Team.[4] This new team of four, with three members of the ARS Work Group carried over for continuity, was formed "to oversee the process of preparing collections for the ARS, and coordinate and monitor subject specialists' activities in completing needed collection reviews."[5] Like the previous ARS Work Group, the ARS Implementation Team reported to the university librarian.

Because it was the largest collection to prepare for the ARS, the 160,000-volume periodicals collection was given first priority. Scanning and linking bar codes for periodicals is a relatively routine procedure, so the ARS Implementation team decided that it would be adequate to employ student assistants for the task. The biggest obstacle was that the nearest PCs that could be used were on another floor. Through a combination of funding from the campus Technology Steering Committee (TSC), the Information Technology Department (IT), and the University Library, five laptops and bar code scanners were purchased, and wireless hubs were installed in the library. Unfortunately, it was discovered that the wireless was unreliable in locations with such physical features as concrete, steel beams, or metal book shelves. The wireless connections worked in the periodicals room as far as the last five rows of shelving, which were separated from the wireless hub by an emergency stairwell. At this point the staff used a one-hundred-foot cable connected to a laptop to finish linking the bound journals.

The particular challenge faced with linking the reference collection was that about one-third of the collection, or ten thousand volumes, were targeted to be available in interim space. Before any volumes could be linked, subject specialists had to review the collection to decide which volumes were to make up the interim reference collection, which volumes were going into the ARS temporarily and coming back out when the new building was complete, and which volumes were going into the ARS permanently. Different location codes were created and manually input into the item records accordingly.

Government documents were difficult because they ranged in size from heavy bound volumes to single sheets of paper. Additionally, huge portions of the collection did not have bibliographic records. To make more efficient use of space in the ARS bins, these collections were loaded using two different procedures. For substantial runs of bound volumes, brief check-in records were replaced by full cataloging, and the volumes were given individual item records. These volumes were loaded into random bins as with the rest of the library's bound periodicals. The remainder of the collection—largely uncataloged and much smaller items—were loaded into dedicated bins in SuDoc number order. An item record was created for each of these bins, with the SuDoc range it contains appearing in the volume field. These item records were then attached to a collection-level brief record in the online catalog. Extra bin dividers and upright files were used to keep these flimsy materials in order, as they get jostled around in moving bins.

Besides oversight, the ARS Implementation Team accomplished a number of other tasks. For example, a time study of the move was conducted, in which it was determined that it would take thirty minutes to move and load one hundred volumes per student assistant.[6] This calculated to approximately sixteen weeks to move and load approximately 900,000 items, utilizing three shifts of students twelve hours a day, for six days per week. In actuality, bottlenecks kept appearing that were not considered in the time study. These included problems with the ARS hardware, the concurrent need to retrieve requested materials every thirty minutes, and low student staffing during finals and intersession. Nevertheless, 22,000 volumes on average were loaded per week.

Lessons Learned

Careful planning and preparation paid off. As construction continues on the new building, all materials have been moved and successfully prepared for loading into the ARS. The old library building was demolished in July and August 2006. Throughout the process of planning, preparing, and then moving materials into the ARS, many valuable lessons relevant to any library facing construction-related disruption of services were learned. Some of the more important lessons are highlighted below.

Keep Your Key Constituents Informed

As faculty and students observed the ARS being constructed, rumors abounded about what materials were going into the ARS, how long they would be in the ARS, and what would be left in open stacks in the new library building. Problems were compounded because library staff, being fully involved in the planning and preparation, was slow to respond to the questions and speculation. A series of negative articles in the student newspaper became a catalyst for a concerted effort to get the word out. A series of open forums were held for faculty; library leaders went to student government meetings; a Web site was developed with construction information; and articles were published in the student newspaper.[7] The Web site was later adapted to provide general information on the information commons and its services.

Clarify Terminology

Make sure that there is a common understanding of terminology used. For example, the construction contractors

said that they would install the dividers in the ARS bins. For them, "install" meant laying the dividers in the bottom of the bins. For librarians, "install" meant inserting the dividers upright in the proper configuration in the bins.

Make Sure Staff Understand What Needs to Be Accomplished

Staff members often have much to do and conflicting priorities. Because no outside staff was hired, regular staff had to reprioritize in order to accomplish what needed to be done. Also, a conscious decision was made to utilize student assistants for much of the preparation and moving of materials. The ARS Work Group and ARS Implementation Team consulted with numerous staff throughout the planning process. Communication engendered support for the project from those who would eventually become affected by it.

Understand Who Is Financing the Efforts

Project money that was held centrally within the university was not immediately available. For the first two years of the project, the library paid for all student help out of its operational budget because funding from the university would not have come in time for deadlines for preparing the materials. It was only during fiscal 2004/2005 that project money was released from a university fund and allocated to the library. During fiscal 2005/2006, the library once again funded student assistants, as there was no further funding available from the university. The shifting nature of funding for the project required flexibility and creative budgetary oversight.

Talk to Colleagues at Other Institutions

Members of both the ARS Work Group and the ARS Implementation Team made site visits to Sonoma State University and University of Nevada, Las Vegas, to observe systems in action. It was very helpful to understand through others' experiences how an ARS functioned and the procedures they followed for preparing and loading materials. Instead of starting from scratch, the team was able to build upon the experiences of others.

Make Sure It Is Clear Who Does What

Often, the staff who make plans are not the same as those who make them operational. For example, the systems manager, who played a major role in making the software functional, was not a member of the ARS Work Group or the ARS Implementation Team, and thus was only brought into the project during oversight. The consequences of leaving out a key player during the planning stage is that you might overlook an essential component. Depending on what that component is, the implementation could be significantly delayed while incorporating the missing elements into the plan. By not involving the systems manager, for example, the need to develop loan rules for ARS materials was overlooked. Luckily, this did not require much time to correct, so implementation was not significantly impeded.

You Will Always Overlook Something

Despite your careful attempts to anticipate all contingencies, you have to be flexible enough to overcome the unexpected bumps in the road. If you have a team-oriented approach to problem-solving, these problems can be resolved rather quickly. For example, it was only when the library staff was ready to start loading books into the ARS that they discovered it would be necessary to develop locations and loan rules in the Innovative Interfaces library system for materials transferred to ARS. Most oversights, while problematic, are not critical, so keep perspective while working them out.

Listen to the Complaints and Move On

Even though the library had conducted focus groups asking faculty, staff, and students what they wanted in a new facility, there seemed to be numerous complaints once it became reality. Everyone wanted the books to remain on campus during construction. And, a certain vocal group wanted to retain collection browsability, which was not possible given the lack of space on campus; constructing an ARS was the only feasible solution. It seemed like the more the library tried to explain the situation, the more the complaints continued. This was frustrating for library staff and end users alike; however, it could not be allowed to delay the project.

Any major construction project such as this follows an extended timeline. In March 2002 the planning and decision-making process began. Preparation of the materials for loading into the ARS began in January 2003, and the first volume was loaded into the ARS in February 2005. Construction of the ARS was completed in January 2005, and materials were loaded until June 2006. Today, the ARS is completely loaded and is now fully functional, with materials being retrieved upon request. Staff have vacated the current library structure and relocated to an interim space for two years, until fall 2008. By using a team-based approach, the planning and implementation phases went relatively smoothly. More important, services continued without interruption.

References and Notes

1. Michaelyn Haslam et al., "The Automated Storage and Retrieval System (ASRS) in Lied Library," *Library Hi Tech* 20, no. 1 (2002): 71–89; Linda Shirato, Sarah Cogan, and Sandra Yee, "The Impact of an Automated Storage and

Retrieval System on Public Services," *Reference Services Review* 29, no. 3 (2001): 253–61; Sandy Heft and Paula Hammett, "Putting the Robots to Work: The ILS and an Automated Storage and Retrieval System," presentation, Ninth Annual Innovative Users Group Conference, Santa Clara (Calif.), May 19–22, 2001; Michaelyn Haslam, "The Lied Automated Storage and Retrieval (LASR) Unit," *Library Hi Tech* 23, no. 3 (2005): 306–12.

2. To view an explanation of the request process, go to www .scu.edu/library/services/circulation/ars/requesting.html (accessed May 7, 2007)

3. Charge to ARS Work Group, Orradre Library, Santa Clara Univ., in a memo dated March 1, 2002.

4. The ARS Work Group report is available as a Word document from Paula Popma, ppopma@csufresno.edu.

5. Charge to ARS Implementation Team, Orradre Library, Santa Clara Univ., in a memo dated July 29, 2002.

6. The time study involved having two students and one staff each take one hundred volumes off the shelves, move them to a staging area, scan the bar codes, and place the volumes in a mockup of a bin. Each of them was timed using a stop watch, and an average time calculated.

7. See "Welcome to the Learning Commons and Library," www.scu.edu/newlibrary (accessed May 7, 2007).