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# Smart Pull for Remote Storage: How to Keep (Mostly) Everyone Happy When Making a Large Collection Move to Remote Storage

*Tom Klingler, Assistant Dean, University Libraries, Kent State University*

## Background

In fall 2010 at Kent State University, the University president and Provost decided to build a Math Emporium, a 250-seat computer lab to deliver remedial math to about 3,500 students per year. Given students' trouble with math throughout the curriculum and the need to improve retention, the Emporium became a University priority. For a variety of reasons, from the strategic to the geographic, a Math Emporium on the second floor of the library became a University priority, necessitating the move of the complete journal collection consisting of 253,000 volumes. This collection was housed on 5.2 linear miles of shelving on our largest collection floor. This decision set off a cascade of issues. Even though we subscribed to 20,000 e-journals and over 80% of our journal content was electronic, we still had 8,000+ paper journal titles on the second floor. If we had a way, some of us believed, we could probably move a lot of books off campus more easily than the entire journal collection. We knew that the 1.1 million books in the general collection included many very old and very underused items. Nevertheless, the first approach was to come up with a plan to move the journals.

## Early Goal

The earliest goal was to establish an off-campus journal service center that would house the journal collection and the staff and equipment to service it. Very early it was realized that this goal would cost millions of dollars, require additional staff, and commit us to an expensive future. In spite of the high cost of an off-site journal center, we issued an RFP for moving the journal collection off-site.

## Change of Plans

During vendor interviews and visits that were part of the RFP process, we struck upon a different approach in conversation with one of the vendors.

This vendor specializes in high-density storage for business and government and uses very smart inventory software. We speculated that the combination of his software and staff expertise combined with ours could result in a different approach to clearing substantial shelving space.

Rather than move journals wholesale, we decided to try to design a "smart pull" process whereby we would pull enough books off of the shelves to provide room for shelving the journals a few floors higher in the building, freeing up the second floor for the Emporium. To pull off this project, instead of moving 253,000 journal volumes off campus, we would need to move 400,000 books. As planning and discussion continued, moving older, lesser-used books came to be seen as more politically and practically acceptable than moving the complete journal collection. We assumed that book retrieval and delivery to campus would be cheaper than journal article or volume delivery.

We set about to design a pull file that would include books that satisfied one of these criteria:

1. Low use with publication date before 1970.
2. Very low use with publication date between 1970 and 1990.
3. Not included in specifically requested "safe" call number ranges solicited from the faculty.

We concluded that we could empty two of the six book floors with this approach and then use the two empty book floors to house the dislocated journals.

## Turning Down the Dials

Besides wanting to build the Math Emporium, the president also had been wanting to dramatically increase student seating and lounge space in the library. Over the decades, enrollment had expanded, and library student seating had shrunk dramatically due to incremental remodeling for additional administrative offices and the steady

growth of the paper collections. We decided to try to give the president what he wanted by clearing an additional book floor. As we refined our bibliographic database pull criteria and our planning spreadsheet, we realized that we could empty ANOTHER book floor by simply adjusting the criteria of the pull. The president would love it!

We set about to design a *new* pull file that would include books that satisfied one of these criteria:

1. Low use with publication date before 1990.
2. Very low use with publication date between 1990 and 2000.
3. Not included in specifically requested “safe” call number ranges solicited from the faculty.

This new pull file included about 600,000 records, slightly more than half of the 1.1 million items in the general book collection. While to some it seemed crazy, or at least questionable, to remove over half of the book collection from the main library, when offered open second and fourth floors, the president loved it and agreed to pay the moving costs.

## The Revised Plan

The revised plan included these main features

1. No off-campus journal service center.
2. A “smart pull” of 600,000 books from the shelves to remote storage.
3. A compression of the remaining books from six floors to three.
4. The move of the complete journal collection from the large second floor to two of the former book floors.
5. An empty second floor for the Math Emporium.
6. An empty fourth floor for a new lounge/study area for students.
7. Current availability of the 600,000 remote books in the catalog for next-day delivery to campus by the storage vendor.

## Pictures of the Plan

Figure 1 shows the collection before the move. The second floor held the 5.2 linear miles of journals. Floors 4 through 9 each held about 185,000 books, totaling about 1.1 million books.

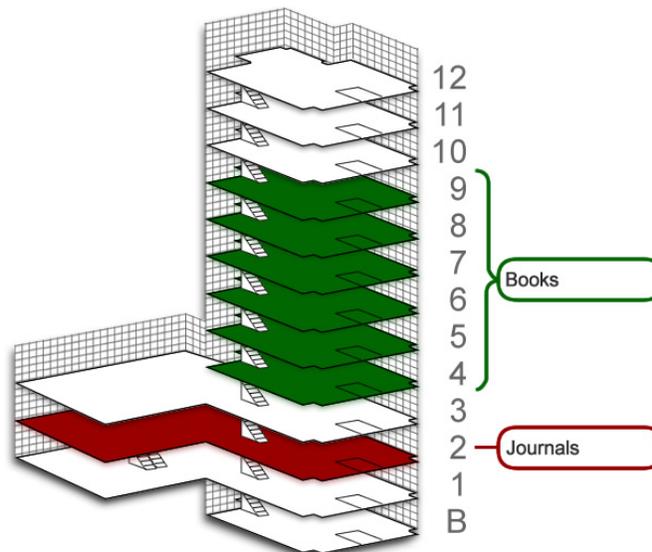


Figure 1. The Collection Before the Move

Figure 2 shows the revised goals of the project:

1. Math Emporium on the second floor;
2. Student lounge on the fourth floor;
3. Journals on the fifth and sixth floors;
4. Remaining books on floors 7 through 9.

The tower floors are about 8,000 square feet each. The second floor overall is more than double that amount. The Math Emporium occupies about 12,000 square feet and includes

250 PCs, three large teaching/proctoring stations, and two substantial open study areas.

Figure 3 shows what happened first. Since the Math Emporium construction had an early start date, we had to move the bound journal collection off campus for 2 months in late spring 2011. Current journal issues were moved to temporary new shelving on the first floor for the duration of the project. Then the smart pull began. Books started moving off site.

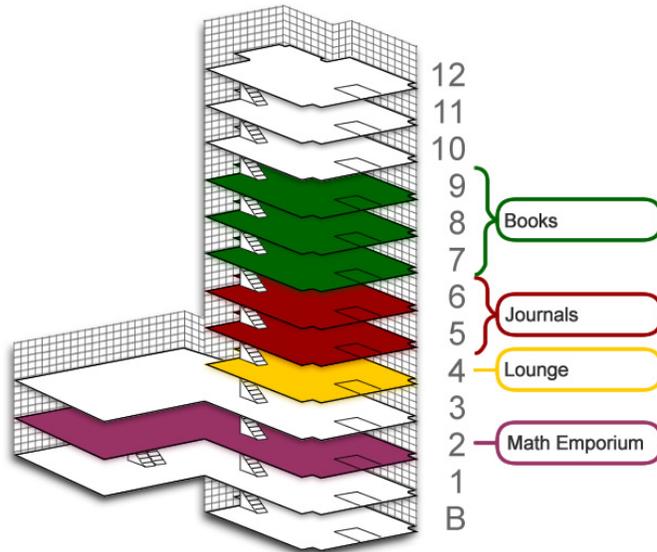


Figure 2. Stage One of the Process

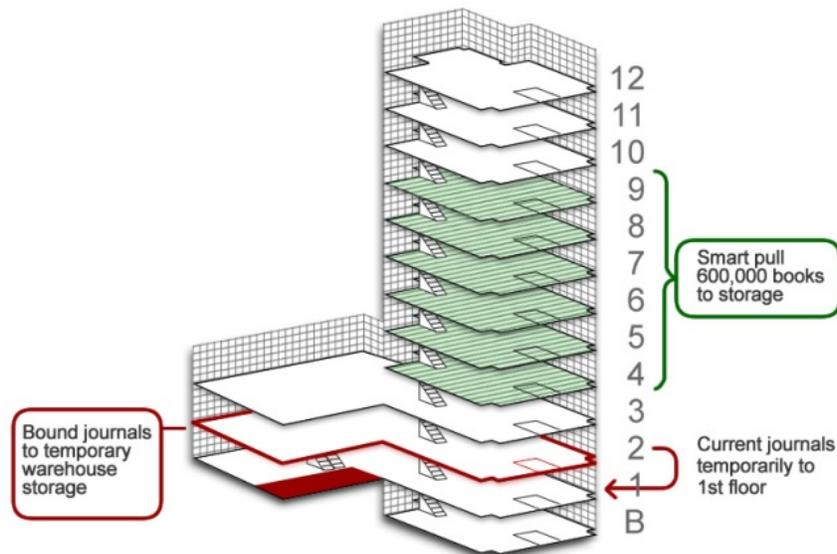


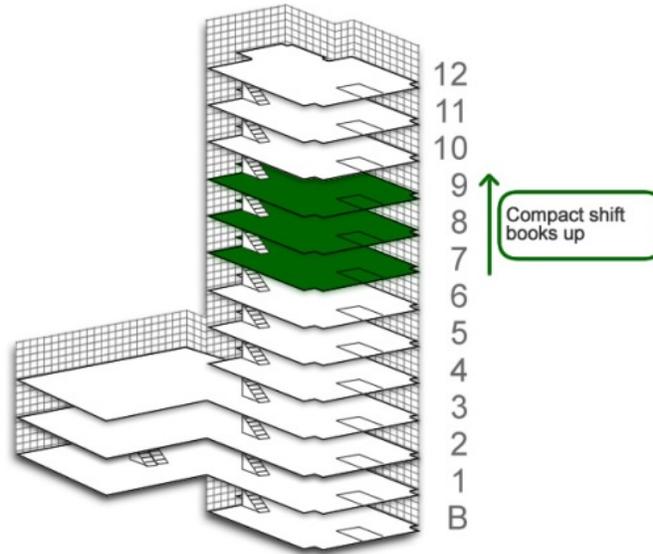
Figure 3. Revised Goals of the Project

Throughout the process, with overnight turnaround from the shelves to the remote facility, any given book was unavailable for less than 24 hours. We never changed the “Available” status in the online catalog. Books moved on day 1 were available for request on day 2 and delivery to campus on day 3. In 7 weeks, the smart pull was complete. The 600,000 books were available in the vendor’s remote storage facility.

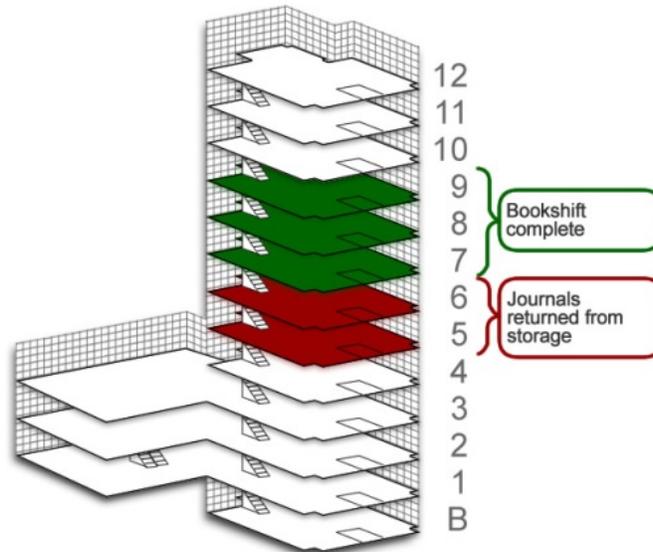
Construction was underway on the second floor. And, the tower floors 4 through 9 were half empty.

Figure 4 illustrates the fact that the mover had to compact shift the six half-empty floors of books into three full floors of books.

Figure 5 shows the return of the journal collection from off-campus storage to the newly-emptied fifth and sixth floors.



**Figure 4. The Mover had to Compact Shift the Six Half-Empty Floors of Books into Three Full Floors of Books**



**Figure 5. Return of the Journal Collection from Off-Campus Storage to the Newly Emptied Fifth and Sixth Floors**

The loose current issues that had been temporarily housed on the first floor were rejoined with their companion bound volumes and shelved in a single alphabet on the fifth and sixth floors.

And Figure 6 shows the project completed, the goals accomplished.

How many “lost” and “missing” and “on search” and “withdrawn” and “claims returned” projects to clean up these problems had not been finished over the years, and what were the true consequences of this reality? Could we really build this pull file solely from a database extract? Could we really prevent the library staff from having to do any work at the shelves as part of this project?

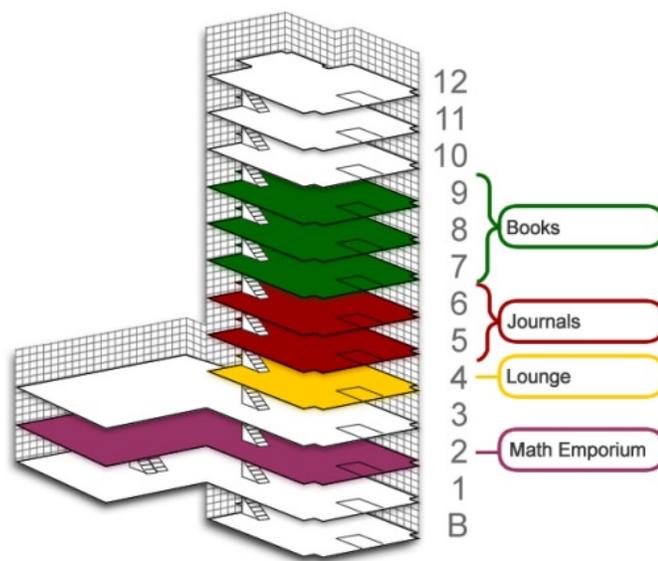


Figure 6. The Project Completed, the Goals Accomplished

### The “Smart Pull” Specifics

Identifying what books to pull from the tower collection was more difficult than initially assumed. At first we thought we would simply run a file of books with older publication dates and lower total circulation counts and take an early lunch. Comparing a few small test files to what was actually on the shelves provided an early dose of reality therapy. We realized early that sending untrained vendor staff to the shelves with barcode scanners might result in more surprises and delays than we had imagined. What about the books without barcodes? What about the uncataloged items which mysteriously had resided on our shelves in spite of 30 years of local system automation? What about those sets of classified serials with hundreds of volumes each, the ones that we knew we didn’t want to move? Did we want the vendor’s staff needlessly scanning those thousands and thousands of barcodes at the shelves? What about those items still in the database but suppressed from the public catalog?

As we mulled over these issues during the late January doldrums of a grey northeast Ohio winter, objections began to surface from some of the faculty as well. “Wait a minute,” they said. “Just because the critically important books in my field are really old and have never been checked out doesn’t mean that they aren’t critically important to me and my research and teaching! Indeed, I bring my students to the library shelves all the time to use these books!” Fascinated by the juxtaposition of such claims with our circulation data, we nevertheless realized that we would have to provide a “protection” mechanism to address these objections. The protection mechanism would work two ways. First, it would protect the faculty’s chosen books from being moved off site. Second, it would protect us from disagreeable political fallout!

After addressing all of these issues, we came up with our final search criteria for the books to move off site. Books would be moved off site if they met any of these criteria:

1. Low use (fewer than 10 checkouts) with publication date before 1990.
2. Very low use (fewer than 5 checkouts) with publication date between 1990 and 2000.
3. Not included in "protected" call number ranges solicited from the faculty.

The database search criteria first eliminated all the protected call number ranges, then it ignored the problematic statuses like "missing" and "suppressed," then it proceeded to identify specified circulation history within specified publication date ranges. A sample piece of the draft "smart pull" search strategy from our Innovative Interfaces database illustrates some of the complexity of the search:

```
ITEM SUPPRESS not equal to "s" AND
BIBLIOGRAPHIC DISPLAY not
equal to "s" AND ((ITEM STATUS equal to "-" OR
ITEM STATUS
equal to "d" OR ITEM STATUS equal to "m" OR
ITEM STATUS
equal to "n" OR ITEM STATUS equal to "z" OR
ITEM STATUS
equal to "_") AND ITEM I TYPE not equal to "100"
AND ITEM
NOTE All Fields don't have "browsing" AND
BIBLIOGRAPHIC BIB LVL
not equal to "s" AND BIBLIOGRAPHIC LINKED REC
not exist to ORDER
AND (ITEM LOCATION equal to "ma" OR ITEM
LOCATION equal to
"manon") AND ((BIBLIOGRAPHIC Date One greater
than "1990" AND
ITEM TOT CHKOUT less than "10") OR
(BIBLIOGRAPHIC Date One less
than "2000" AND ITEM TOT CHKOUT less than
"5")) OR ITEM
LOCATION equal to "mncat")
```

### The "Smart Pull" Technique

In spite of the early goal of trying to complete the project using no library staff time at the shelves, we did end up working at the shelves a little to expedite the process. The most staff time was spent applying yellow "caution" tape across large sets of classified serial volumes in order to prevent the useless barcode scanning and

handling mentioned earlier. Library staff also was available to the vendor staff throughout the project when an unexpected problem required a quick answer to keep the vendor teams moving down the aisles. Such problems included incidentals like missing barcodes, mismatched titles, and the like.

The overall pull technique worked like this:

1. Started with smart pull file of 600,000 items constructed from our bibliographic database extract.
2. Vendor loaded the pull file onto their server and 9 laptops.
3. Vendor scanned all 1.1 million items on the shelves to identify the 600,000 in the pull file. Library staff did not have to move or shift any books. Vendor did all the scanning, packing and moving.
4. Vendor scanned the found books to moving boxes, which were moved same day into remote storage inventory. Vendor tracking technology built a "FedEx-like" trail of every position every book ever occupied. A book was scanned to a box, which was scanned to a pallet, which was scanned to a truck, and then to a warehouse position, a warehouse aisle, and a warehouse shelf.
5. Book's item status remained "Available" in the public catalog throughout the process.
6. Each night upon ingestion into storage inventory, the vendor sent us a confirming file with records for all books processed.
7. We used the confirming file to update the book's new location in public catalog from "Stacks" to "Remote Storage."
8. After moving on day 1, and ingestion into the storage facility on day 2, the book was ready for online circulation requesting on day 2, and delivery to campus on day 3.

### Summary Successes

1. Collections Moved/Space Cleared

Conception and early planning took place in November 2010; RFP and vendor visits in January

2011; project redesign in February; the start of the move in March; completion of the move in April; and start of book requesting from the remote site on April 20, 2011. Now, 18 months later, we consider the project a success. In a month span, we moved the complete journal collection twice, returning it to the main library tower. In a 7-week portion of those months, we moved 600,000 books to offsite storage. We accomplished the goals of emptying the second and fourth floors, as well as keeping the remote collection available for requesting and delivery.

## 2. Collection Integrity Maintained

Floors 7, 8, and 9 still house a circulating collection that represents the complete LC call number alphabet, A–Z. No complete subject collection or call number sequence has been relegated to store. The collection includes books with more recent publication dates and some minimum total historical use. Special, narrow call number ranges were “protected” from the move off site; consequently, concerned faculty are more relieved and supportive. For example, we allowed “QE39” and “GB561–GB1282” to be protected. We did not accept broad requests like “everything in N” or “all of PQ1–PQ3999.”

## 3. Low Circulation from Storage

From April 20, 2011 through October 15, 2012, we have circulated 16,340 items from the storage facility back to campus, 2.7% of the total storage collection. These low figures show that we either moved the right books to storage or discouraged people from requesting them by doing so. Of the 16,340 items circulated, 62 have circulated 3 times from storage. The routines we have in place to track this activity have allowed us to reassign these 62 items to the main library upon their third circulation from storage.

As we continue to adjust the storage collection by sending additional materials to storage and returning materials that get used more often than projected, we expect this 2.7% circulation figure to drop. If this percentage drops in the next couple years, we will be able to congratulate ourselves on our efficiency.

Then, we’ll have to start weeding the storage collection!

## 4. Remaining Collection’s Use Maintained

In spite of moving 55% of the 2010 circulating collection off site to remote storage, total circulation activity has remained relatively constant after the move, declining only 10%. The move took place in March/April of 2011. These two figures show total checkouts the year before the move and the year after the move.

BEFORE MOVE: Total Checkouts from March 1, 2010 through Feb 2011: 245,927

AFTER MOVE: Total Checkouts from March 1, 2011 through Feb 2012: 221,732

The 10% decline in annual circulation can be attributed to a number of factors including:

- a. Decline in (paper) book purchasing.
- b. Increase in e-book purchasing and implementation of e-book DDA program.
- c. General decline in academic library book circulation.
- d. Relegation to store of 55% of the circulating collection.
- e. Partial inaccessibility of the shelves in March/April 2011 due to the move project.

In any case, the move of 55% of the collection to remote storage did NOT result in a 55% decline in circulation!

## 5. Move Costs Bundled with Construction Project Costs/Most Labor Performed by Movers

The president’s timeline and dedicated project funding, combined with our project design, enabled us to effectively outsource all the manual labor of the collection moves and shifts. Library staff was able to focus on the project plan, the details of the “smart pull” file, the system-related aspects of the move process (inventory control, daily audits, record updates, location updates, etc.), and the design of the ongoing delivery and maintenance procedures that would make the

project a true success. The moving companies' staffs did all the scanning, packing, moving, and compact shifting required of the project.

### **Cautions for Your Project**

#### **1. Make Time to Plan and Execute**

Our project was a bit too hurried. Try to start planning a year in advance of such a large project to allow time to deal with surprises.

#### **2. Confirm Your Technological Capabilities**

We offered the "protected" call number range option before realizing how difficult it would be to execute this in our database extraction.

Consequently, we had to have staff add a flagged field to each record that was to be "protected." This flagged field could then be used in the extraction logic.

#### **3. Measure Twice; Cut Once**

In spite of several double-checks, a misplaced "greater than" sign in our database extraction search logic resulted in 10,000 books going to the wrong place and 10,000 more not going to the right place. Be sure to check everything one more time than you think is necessary.

#### **4. Stick with the Plan**

Finalize your plan and stick with it. Changes to our plan after final specifications resulted in some unsatisfactory outcomes.

After the plan was finished—the numbers, dates, and prices specified—and the contract in place, several administrators added new requirements to the project. They added the journals from the Chemistry/Physics and the Mathematics branch libraries; they added wide aisles for public seating on the tower floors; they added the shift of all the shelf ranges from the old 30" aisle width to the more ADA-friendly 36" aisle width. Together these after-the-fact changes resulted in dysfunctionally high shelving densities in the remaining book collection.

#### **5. Be Patient**

Surprises will happen. Elevators will break. Contractors' temporary staff will disappear.

#### **6. Get Lucky**

Find a moving and storage vendor that uses good technology and methods and has smart, creative, hard-working staff. Combine these ingredients with your own strong technical staff, and enjoy the results!

### **Ongoing Service and Maintenance**

The plans and techniques that we have for ongoing service and maintenance must be largely reserved for a future paper. In short, our processes and plans include

- a. Daily monitoring of circulation traffic from the remote storage collection.
- b. The permanent return to the on-campus collection of remote items that circulate for a third time from remote storage.
- c. Processes for sending additional items to storage upon identification.
- d. Processes for permanently recalling items from storage upon staff request, for example, to re-unite items in a set that were unintentionally split apart during the move.
- e. Vendor processes for identifying exceptions (lost, never sent, etc.).
- f. Vendor processes for daily final circulation check-in of items returned to storage from circulation.

### **Systems Used**

1. Kent State University Libraries ([www.kent.edu/library](http://www.kent.edu/library)) uses Innovative Interfaces ([www.iii.com](http://www.iii.com)) online catalog under the name "KentLINK" (<http://kentlink.kent.edu/>)
2. Storage vendor is Assure Vault ([www.assurevault.com](http://www.assurevault.com)) a division of The HF Group ([www.thehfgroup.com](http://www.thehfgroup.com))
3. Storage vendor uses Total Recall ([www.dhsworldwide.com](http://www.dhsworldwide.com))