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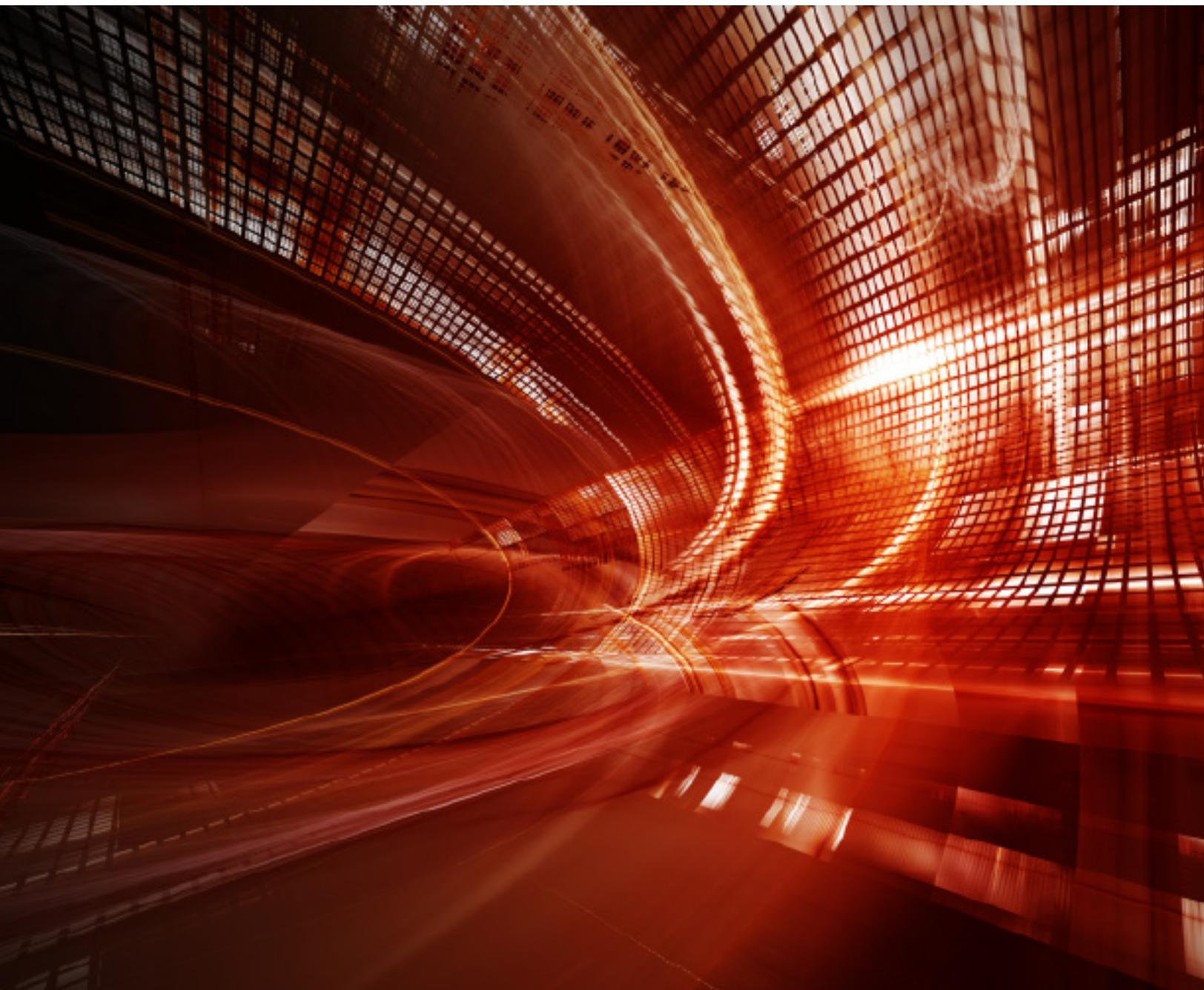
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- User-Centered Design for Online Reference Systems
- E-book Strategy
- Creating Tech-Agile Students

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From the Editors

WELCOME TO THE SECOND, Winter 2014 issue of *eContent Quarterly*. Since launching the journal at 2013 ALA in Chicago, our goal has stayed the same: while the library and publishing industries remain in a state of flux, we want to tackle e-content from every angle and through the voices of a variety of information professionals shaping it. This includes public, academic, and school librarians as well as publishers, aggregators, book distributors, and all others in the business of selling e-content to libraries.

While the intention isn't to center each issue of the journal on one theme, things often serendipitously fall into place, making it hard to ignore the common threads among the articles. So while Issue 1 offered four articles on four distinct topics by four individuals with varied backgrounds—an experienced book vendor, a gadget-loving academic librarian, a metadata specialist, and a K–12 educator and a children's librarian—the issue's overarching theme was the importance of partnerships. Issue 2 is as eclectic but it, too, echoes a subject that rises to the top: the needs of the user.

In the opening article, Lura Sanborn provides a sweeping overview of the digital market and the reasons why embracing a buildingless library makes sense for every institution not “there” yet. With an “I've made up my mind” attitude toward e-only collections, Sanborn addresses “the sheer magic digital collections bring to the research environment,” encouraging librarians to consider moving “beyond the building.” And Sanborn's actions speak as loud as her words: at St. Paul's School in Concord, NH, she replaced the Faculty Room Library (after it was shut down) with a Faculty Digital Library (with the help of the LibGuides software), which led to an even more comprehensive and tightly welded collection.

While most articles featured in the journal are narrative-driven and tell stories to inspire and instruct, general overviews such as Sanborn's are just as important. As we

get tangled up in in-depth discussions about e-content—replete with words and phrases that often have entirely different meanings outside the confines of our professional worlds—we shouldn't forget that a significant number of information professionals still needs this type of encouragement and sobering reminders of why their resistance (or inability) to go digital is only hurting them and those they serve. "I will happily push our photocopier into the pond if it means I can buy the last three years of Harvard University Press's titles in e-format," proclaims Sanborn, rightfully asking: "When did the academic library become all things for all people: copy center, university press, maker space, snack bar, and study center?"

What follows Sanborn's overview are three articles discussing, in different ways and within very different cultures, the importance of the user in the process of creating as well as implementing e-content. John G. Dove, currently senior publisher at Credo Reference, shares perspectives of three distinct "e-reference" companies catering to libraries. Dove has extensive experience in technology businesses, including e-publishing and online education, but it is his fascination with the purpose of the reference book that has informed much of his research in recent years and has contributed to solidifying the Credo brand in library circles. Quoting the first sentence of the preface to the first edition of *Encyclopaedia Britannica*, Dove reminds us that no matter what type of content we are aggregating online, we must always pay close attention to the utility of the published work. And to be successful at transforming the purpose of a published work online, we must put the user at the center of design. Dove profiles three companies whose products represent user-centered approaches to designing online reference platforms, including Credo Reference, iFactory, and Reverb, and shares insight from their leaders.

The remaining two articles may be defined as informal (but insightful) e-content case studies, in which two academic librarians and one school librarian share the initiatives they've taken at their institutions to bring e-books to their users. We have strong, personal interests in these two stories, since we attended the two schools during our formative (alas, predigital) years: Mirela attended New York University (NYU), both undergraduate and graduate, while Sue is a graduate of the Mother of Mercy High School (MMHS) in Cincinnati.

Angela M. Carreño and Bill Maltarich, both involved with expanding NYU's e-collections, share their institution's much-admired, dual-hosted e-book strategy and describe each of its three imperatives—Aggregation, Integration, and Cooperation—in great detail and with realistic expectations for the future. Their goal: to highlight what has worked well and what hasn't, in the hope of helping others avoid the pitfalls NYU faced along the way. What resonates throughout, among other things, is the librarians' keen awareness of the users' needs and the insistence on giving them as many "points of entry" into the content as possible. While NYU's e-book strategy has been quite successful and has helped serve the needs of what has become a Global Network University requiring a true "global" library, Carreño and Maltarich remind us that the strategy remains and will likely remain a work in progress.

Linda Behen of MMHS also points to the constancy of change in her own story: “At the time this article is published,” she says “it’s to be assumed that we’ve already made some changes to our program.” She describes her school’s approach as “not necessarily original,” but its combination of various tools and strategies make it unique. MMHS takes into consideration that there is no single device or method that can solve every information need. This is why its students have access to both a Mac and a PC lab, a 1:1 iPad program, a BYOD (Buy Your Own Device) program, library loaner laptops, Kindles, and more. “Individual preferences change as an assignment or informational need changes,” says Behen, “and the library’s goal is to satisfy that momentary need, and more importantly, to develop students into curious, savvy information literate users who confidently approach, and perhaps even embrace, the hunt for useful and reliable information.”

Regardless of what type of library user we may be profiling—be they experienced researchers using sophisticated reference products, undergraduates attending a “global” university, or high school students in the Midwest with varied financial backgrounds—placing their distinct, and constantly evolving, needs at the center of product development (as described in Dove’s article) as well as a library’s e-content strategy (as described in NYU and MMHS stories), is paramount. The articles in this issue attest to the fact that the needs of the user are the single most important aspect of content development.



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Bookless Library?

I Raise You the Building **by Lura Sanborn**

PREDICTIONS FOR A bookless library have appeared in popular media for the last decade, with ponderings on the subject dotting the professional literature. What seemed like science fiction just a few years ago has now become the reality. The question is no longer “Is ‘bookless’ the future?” The question is now: “What of the building?”

As libraries push further into predominantly digital content, there is an opportunity—particularly for small and mid-size academic libraries—to reinvent their physical paradigm. If more library-purchased content is being housed in the ether, what then of the library as space? It would appear that digital movement presents an opportunity to more precisely define and adhere to a research support/acquiring/teaching mission.

Just as the digital transition is underway for libraries, the concept of formal education is simultaneously undergoing great change. MOOCs, flipped classrooms, and a move from the didactic to the cooperative are shifting the paradigm for education, much as digital content is shifting the paradigm for academic libraries. Now is a great time, then, to be conversing as this massive evolution is occurring in education. Doing so would seem essential to continue ensured placement of the library firmly and more evidently within the academic ecosystem.

Last spring, my school (St. Paul’s School in Concord, New Hampshire) boxed up and deposited on the main library’s front steps the library’s single branch

collection known as the Faculty Room Library. The Faculty Room Library was a long-existing physical space housed in a separate academic building. It contained a print collection of pedagogical titles, a small print reference collection, as well as a browsing collection of a few dozen periodicals. When the school made the decision to create more faculty offices by renovating the space, the Faculty Room Library print collection was handed back to the Main Library. To replace the loss of a faculty-specific space, I created the [Faculty Digital Library](#). The mission of this digital library, as stated on its top page, is to be “a digital library of sources, curated and purchased by the SPS Ohrstrom Library, to engage, enrich, and aid the SPS Faculty.”

Utilizing the LibGuides software as a frame, I extracted content from the library’s existing subscriptions that directly support educators and academic subject specialists. Some education-specific collections had been living more generally (languishing?) on the library’s main website. Other collections were included with accompanying directions and screenshots demonstrating how to extract education- and/or subject-specific research (such as pulling out an education-based subject from ebrary, GVRL, Project Muse, or JSTOR). Additional support documents that had been living more broadly on the library site (such as a general overview of education and copyright, citation information, a plagiarism guide) were also placed within this LibGuide space. As an additional bonus, the top page of the LibGuide very publicly honors the donor family that made many of these digital collections possible. The new Faculty Digital Library was shared via e-mail, featured in a library blog post, and is listed on the top page of the library’s site within the bulleted list of our most important services. This digital library, a response to a lack of physical space, actually led to a more cohesive, comprehensive, and tightly welded collection, with 24/7 access and the blessing of remote accessibility.

This article is an attempt both to identify mass movement and advantages in libraries going digital and to provide ideas and real-life examples related to deconstructing the stacks. It is a discussion of the sheer magic digital collections bring to the research environment, with reasoning encouraging librarians to consider moving beyond the building. Digital collections bring a powerful thoroughness to research, never before seen. Never before, indeed, have academics been able to approach a million newspaper articles, 300,000 e-books (or more; you choose the number), a million journal articles, and be able to, in seconds, extract from all of that, or just the pages, or the paragraphs, or the sentences that contain their chosen search terms.

This can be achieved using individual platforms and now, with ever-improving discovery services, a single platform. From anywhere, too. Digital collections are not bound by location nor by when the library has its doors open. Print has a very important, critical history and has led both libraries and research to where we are today. Moving into digital in no way diminishes this past. Today, to provide the best, most effective, and most efficient research tools, libraries have to step from that past and into the digital. I believe that, in order to most wisely use our institutional allocated resources, that move must include both collections and spaces.

Masterful and Efficient Research

The efficacy of digital text, and digital collections, is breathtaking. To be able to approach a collection containing hundreds of thousands of digitized books (or archival newspapers and journal articles) and type keywords that are then searched across every page in every book (or journal, or newspaper) is a mind-blowing feat of efficiency. In thirty seconds, a researcher has at hand a clean list of all the e-books in the searched collection that contain the chosen keywords or phrase, with the page containing those search terms neatly presented at the forefront. Never having to fiddle with an index again: priceless.

At this point, we haven't even left the breakfast table; with academic institutional privileges, one can access the associated library's digital collections from any location with an Internet connection. Delightfully powerful, scholarly e-book and digital collections bring research to wonderful new place of thoroughness and convenience. Locally, at my institution, the superiority of E over P seems to have been realized this past academic year (Sept. 2012–May 2013) as indicated by rough house usage stats counting over 18,000 e-books viewed and 4,000 print books circulated.

Importantly, the one e-book/one user model does not always hold true in the academic environment. While this is sometimes the case, libraries are frequently (but not always) able to purchase academic titles with a multiple, sometimes unlimited, user license. For other products, such as digitized collections of journals, magazines, newspapers, art, newsreels, and artwork, the industry standard is to provide unlimited simultaneous access. This means that in some cases all students and faculty at a given institution could be reading the same text at the same time—a far cry from the over-eager student who once hoarded all available print library books on a topic, to the dismay and potential ruin of fellow classmates.

The speed, effectiveness, and availability of digital content all cause the print collection to pale in comparison. Digital simply outstrips print. Britannica gets it. In March 2012, the company, after a 240-plus year print history, decided to go digital only. If Britannica feels libraries don't need a shelf to store its volumes on, should we?

Evolving Market and Models

The market for academic e-books is, as we all know, burgeoning; just recently it saw the addition of 20,000 e-books from Project Muse; 15,000 from Oxford Scholarship Online; 120,000 from the EBSCO's Academic eBook subscription service; and 90,000 from ProQuest's ebrary subscription—not to mention offerings from JSTOR, Ingram, De Gruyter, Gale, Cambridge, and Springer, among others. These are just some of the more well-known vendors that offer the option of simultaneous user access. Each company routinely adds new content to their collections.

Some offer close to a million titles, and only those that are used by patrons are actually purchased by the library. All those years librarians spent trying to figure out what might be helpful to researchers, and now, the researcher gets to trigger a library e-book purchase (provided the library/institution wants to enact this model). Only what is actually used is what gets paid for. The library then avoids purchasing titles no one uses. Many success stories exist of libraries, from the early days of Bucknell (Perdue and Van Fleet 1999) to the recent Brigham-Young (Schroeder 2012), successfully incorporating this type of model, including the Sam Houston State University library that found “students and faculty performed admirably in the selection of titles appropriate to or recommended for an academic setting” (Shen et al. 2011). In addition to the power of digital text comes the power of new acquisition models (such as demand-driven acquisition), firmly enabled by this digital environment, further facilitating a library to spend its money on titles actually being used.

There are still challenges, however, with the most important being that not everything needed is available yet. Backlist titles seem to be the last to be digitized. Springer, though, in a sweeping move, has made their entire catalog available as a stand-alone database. I am hopeful that other publishers will follow this model and offer comprehensive imprint collections as well as the ability to purchase title-by-title from e-book jobbers and vendors. Although academic libraries focus most heavily on research collections, many do collect some fiction/recreational reading. While OverDrive, 3M, and Freading all make good products, their models, availability of titles, and pricing structure are not quite as easy to embrace as the scholarly e-book models.

But even without having “everything” to hand, libraries today have options like never before. A colleague of mine will sometimes joke, after downloading a batch of e-book MARC records, “I cataloged 7,000 books this afternoon. What did you do?” Massive scholarly acquisitions, available immediately, available (many times) to all simultaneously. The digital marketplace has allowed for an evolution of acquisition models, not only of what, how many, and when, but also who. And nothing about this takes up shelf space.

Future Developments

Once upon a time, in order to find a journal article on a topic, researchers needed first to consult a print journal index. They needed to locate the correct subject index and also determine what index terms were used that represented their research topic. Next, they had to determine if the library collected the journal referenced by the index. (Maybe yes, maybe no, depending on the size and pocket depth of the institution.) And finally, they had to locate the physical journal and consult, and possibly photocopy, the found article.

Now: JSTOR, Project Muse, IEEE Databases, EBSCOHost Academic, ProQuest, and others make millions of journal articles available inside of a twenty-second search; anytime, anywhere (so long as one’s institutional login

credentials are handy). These journal databases utilize natural language searching, allowing the researcher, with surgical accuracy, to locate precisely the location of relevant terms. Searched terms are typically even highlighted, furthering the ease of literature-based research.

The first decade of the millennium saw the transition from print to digital in regard to scholarly journal content. The majority (75–80 percent) of journal collecting, curation, and usage is now achieved via digitized journals in large amalgamators, such as our “old friend” JSTOR (Emery 2013). The second decade of the millennium, predictably, will see the same type of market penetration, this time with e-books. As David W. Lewis recently wrote in a March 2013 piece for *College & Research Libraries*, “The book is departing its physical codex manifestation and will quickly join most other documents as digital entities on the web.”

Add to the equation another newish type of library product titled Discovery Service and things get even more electrifying. This (expensive) service overlays and searches all of the library’s digital content/collections, allowing researchers to enter in any keywords into the discovery service and those keywords will be searched in all of the library’s e-books, alongside all other library-purchased digitized content, such as archival and current newspaper/magazine/journal content. And, these discovery services will often also allow the selection and inclusion of freely available, librarian selected, high-quality content from the web (I’m looking at you, DPLA. And you, Open Access.). Suddenly, and instantly, all components of one’s library digital collections, and beyond, are searched simultaneously.

Libraries have seamlessly transitioned from print-to-digital in the journal marketplace. Books are soon to follow. Additionally, discovery services marry the glory of Google (e.g., DPLA, Open Access, historical library/museum digitized freely available content) with library scholarly collections. And once again, nothing here takes up shelf space.

Wide Acceptance

It seems that almost weekly a new report is released pointing to wider e-book acceptance, use, and purchases by both individuals and libraries. Springer (Lenares 2013), JISC (Connaway 2010), OCLC (Littman and Connaway 2004), ebrary (McKiel 2012) and Pew (Rainie and Dugan 2012) have all released reports tooting this horn within the last few years. On a consumer level, remember in 2007 when the first Kindle sold out in hours (Meyers 2007)? OverDrive recently published on its blog some astonishing circulation stats (a cumulation reflective of all OverDrive’s library partners): in 2009, 8.7 million digital titles were checked out, and in just three years that number increased to 70 million digital titles (Orr 2013b). Another OverDrive survey, conducted in June 2013 with over 70,000 respondents, found that 81.7 percent of respondents visit the digital library at least monthly, if not weekly, while 40 percent of respondents never or minimally visit the physical library (Orr 2013a). Big love then, for the digital codex.

This growing e-book satisfaction, acceptance, use, and purchase is likely a foreshadowing of e-book permanence and widespread preference. Just as a Kindle/Tablet/Nook does not require a bookshelf, a large collection of digital files does not require a large physical library.

Beyond Resistance

Are there going to be growing pains and resistance? Sure. In fact, absolutely. A body at rest wants to stay at rest. There will be those embedded in print that wish to stay in print. Internally, there will be those who throw their hands up in the air and declare it is all too much, too complicated, and too difficult to simply keep up. What was shiny and astounding three years ago looks ridiculously musty at this point. Keeping up with and making the best decisions possible regarding digital text is hard, and there will be those who refuse to embrace the new. This is predictable behavior. Fifteen years ago, working as a student assistant at a busy university reference desk, I, and everybody on staff, knew “that professor” who never got over the movement from the card catalog to the OPAC. He would always call the reference desk when in need of a book, refusing—on some principle important in his mind—to learn to use the OPAC.

Evolution takes time. We can stick with what we have, or we can move to make it better. Case in point: iOS 7 is much more sophisticated and pleasing than the initial OS X. Should Apple not have evolved in order to keep a population afraid of the learning curve within their comfort zone? To compare, so too have advancements been made to many of the digital text interfaces available to libraries. And much like with Apple, the interface, quantity, and search capabilities just keep getting better.

Despite the strong movement forward, some still find the concept of a digital library uncomfortable. When the director of the Johns Hopkins Welch Medical Library announced last year that the library was going online only and closing its physical doors, the Johns Hopkins constituency shrieked and formed a committee (Nichols 2013). However, the transition has since moved along and from the outside looks both inevitable and wonderfully enviable (Michael 2013). Instruction librarians are in a discrete space, while the emphasis of the collection is on digital holdings. This model speaks to the essential, core functions of an academic library: collection and instruction.

During the transition, will mistakes be made? Undoubtedly. Should progress and invention not exist for fear of error or discomfort? Surely not. It isn't as if we're throwing out all the printing presses, burning all our paper, and flushing the ink. Instead, we are thoughtfully trying to provide an exponentially greater quantity of text, accessible with no location or time barriers that simultaneously better meets our academic mission. Should the old brick-and-mortar, one-book-one-user in a giant book warehouse actually prove superior, that situation is re-creatable. Unpleasantly and expensively re-creatable, but re-creatable nonetheless.

On that note, there are earlier digital-only library success stories occurring over the last five years that show no signs of reverting back to paper: The Cornell Engineering Library (Lowery 2010) moved to digital; the University of Texas at San Antonio's Applied Engineering and Technology (AET) Library was built digital; Stanford University's Terman Library removed most of its print books (Haven 2010); Drexel University's library is again digital only; and a San Antonio public library recently announced its plans to go all digital (Bustillo 2013). Plus, who can forget the ground-breaking, gutsy move by the Kansas State University Library system that moved its Fiedler Engineering Library to digital-only as early as 2000.

All of these institutions chose to focus on the click and ditch the brick. And that's really the essential question: click or brick? The Johns Hopkins Welch Medical Library committee final report made a crucial distinction in asking probing questions regarding "library as research institution" and "library as space" (Committee for the 21st Century Welch Library 2013). Both of these cost money. Do institutions need to continue the "library as space" model? To provide a photocopier, work table, café, group study space? Are these essential functions of an academic research institution? And if yes, at what cost to digital collections?

I raise my hand for digital research collections. I will happily push our photocopier into the pond if it means I can buy the last three years of Harvard University Press's titles in e-format. When did the academic library become all things for all people: copy center, university press, maker space, snack bar, and study center? It feels like our academic contribution is an addendum, a side bar when it should be our essence (not a vapor). Better to chase just one fox (et tu, Borders bookstores?). I move to make our academic contribution—meaning, our digital research collections and our research instruction—our unequivocal core.

Deconstructing the Stacks

So while we are adding gloriously accessible digital collections to our institutions that reflect the research habits of the students who grew up with Google, and thus moving away from the physical library, we need to start deconstructing the stacks. What, then, of those volumes currently on the shelves?

Many e-book jobbers (such as Yankee Book Peddler, a much-used provider of print and digital content to academic libraries) can run a report identifying existing print titles currently held within the walls of a library and then further identify which of these titles are available to purchase in e-book format. This seems like a pretty good starting point. One could keep the same content already in print, and replace it with digital content. I'd take a hard look first, though, at the associated circ stats of those same titles. A recent Cornell study revealed that approximately 55 percent of the book collection published since 1990 never circulated between the years 1990 and 2010 (Collection Development Executive Committee 2010). If those print titles never circulated anyway, and there seems

to be little sense in instantly repurchasing them as digital titles, consider tossing them in the demand-driven acquisition pile, where they can still be seen by patrons but purchased only if used.

In another move to transition older print titles into their parallel digital counterparts, an idea related to public domain titles was recently tossed out at a round-table held during a small New England–based conference (Eight Schools Director Conference, Concord, MA, 2013). One area prep school library has begun identifying print titles within its collection that are both available in digital form and sitting in respected public domain sites, such as the Internet Archive and HaithiTrust. Their plan is to toss the print, keeping the OPAC record and adjusting it to both reflect and lead to the title’s digital presence in either the Internet Archive and/or HaithiTrust. Not a bad plan at all, depending on an institution’s comfort level in linking to public/free sites, especially considering that this school is moving forward with a discovery service, allowing these free texts to be captured in a search in the same way purchased digital titles would be.

In that same vein, if one has an excellent discovery service, does this not call into question the need for an OPAC? The OPAC was designed around the printed manifestation of a book, and utilizing it to locate helpful material leaves the researcher in a position of having to guess from roughly twenty words in each item’s record (author, title, subject headings) that might bring up a relevant title. This seems to be the opposite of thoroughness and leaves far too much to guesswork. The recent OverDrive survey referenced above revealed that of the 70,000 OverDrive users who responded, more than 80 percent skip the OPAC altogether and choose instead to visit the OverDrive e-book platform directly. I’m in favor of reinventing the OPAC as part of this recrafting of the library paradigm process.

Interestingly enough, a new white paper from the ProQuest family states that the traditional ILS/OPACs “is no longer adequate and is, in fact, holding libraries back.” (Serials Solutions 2013, 2). Also worth repeating from this white paper: “With 60 percent of library materials budgets devoted to e-resources, and on a trajectory to reach 80 percent by 2020 (source: U.S. Department of Education) libraries are recognizing the need to move away from the print-centric ILS” (5). As library materials budgets are on track to move almost completely to digital purchases, don’t we then also need a finding aid for this digital content? Furthermore, if faculty feel library databases are nearing the point of obsolescence, as a result of users having to click three or more times to locate a digital item (Mathews 2013), what then of the dusty old OPAC?

Digital Duplication

We are all in the process of writing our own library’s “digital manifesto” (Laughy 2013). And as we do so, we need to ask about the necessity of digital duplication from library to library. Back in the day, every library—including the local public library, the local high school library, and the area academic institution—wanted

and needed to own core print titles, including, for example, the *Encyclopaedia Britannica*. This same duplicative purchasing of print titles occurred, and was in fact necessary, with title after title (core reference, popular fiction, local authors), across every town with libraries within it. When it comes to this content in digital format, however, how many times do multiple libraries need to (re)purchase a single digital file (read: title)? In other words, we've all read about large print repositories being formed by collaborating libraries interested in centralizing a shared print collection. But how about creating a similarly-modeled, shared, digital repository?

As one example, many state libraries do oversee a large OverDrive collection available to many/most libraries in the state (in my state, New Hampshire, this collection happens to be available only to public libraries). Other digital products (by EBSCO, ProQuest, and Gale) are made available, again by select state library governance. What would an expansion of this type of digital repository look like? Would every state library then provide a specific set of core digital titles to its populace? What if this were to be a federal government service? What products should be unequivocally, universally, digitally accessible to our citizens? A general encyclopedia, specialized reference sets, JSTOR, popular fiction, and nonfiction?

Will digital access to unbiased information, to scholarly information, to educational information, become a basic, democratic right? I don't have the answers to this. But I do see the power of information in my work daily. I want that for every citizen of my country (and of the world, in fact). I want access to quality, vetted information to be entirely independent of geography, local property taxes, the affluence of the community, and those old grants and funds that give select institutions crazy-deep pockets.

Of course, the question of who selects is important. Should this be a demand-driven acquisition (DDA) model invoking large democracy? Or 75 percent DDA and 25 percent librarian selected? What should this formula look like? The thought of one overarching governmental purchase does bring to mind Orwellian concerns, although aggregators of content, such as JSTOR, offering comprehensive collections without a selection component, would presumably remain free of government influence. Maybe, for fiction titles, for example, something like the OverDrive Advantage model would work best, with the federal government supplying a base platform and a universal base collection, allowing state libraries/constoria/library agencies the ability to build on that base collection for their constituents.

The DDA model is appealing as a democratic movement but comes with a different risk. Crowd-sourcing the collection entirely may lead to a Wikipedia-like, society-created, and society-reinforced reality. On the other hand, if DDA works so well in academic environments, surely those same advantages (money spent on titles that are viewed/used/opened, instant access to desired titles) could be employed on a national scale. With a formula in place, to prevent a collection composed of nothing but *50 Shades of Grey*, surely sharing collection development with the country's populace will provide greater efficiency, greater use

of the library, and better, more targeted spending. Another option would be a national Netflix for e-books–type model, where the content isn't paid for or owned by the government.

I can envision an enormous digitized back and front list from all publishers, in one aggregate database, an annual access fee paid by the government, with no selection needed as everything available is already within the database. Citizens can then access the database, select the titles they find relevant in that moment, and read on whatever device they already own. No overdues, no fines, no Orwell. No building.

I find the idea of true access for all purely and delightfully democratic. Digital products have the capability to provide a resplendent future of universal democratic access—far more so than their print counterparts. Print collections are dependent on space, staff selection abilities, and more than anything else (typically), budgets. A small, rural community library may be able to acquire and hold only twenty thousand print titles, whereas persons with access to the New York Public Library has fifty-plus million items at their disposal. Digital has the magnificent potential to become a great equalizer and truly embody the essential library principle of access for all.

Directing the Change Wisely

Are we at a place where digital texts and collections can replace the top ten research libraries? Well, no. Not quite everything we need is yet available digitally; more scholarly e-book backfiles (like Springer's) are needed, more digitized special collections/archives would move us along, as would better models for popular materials like fiction. Are we at a place where purchased digital texts and collections can recraft the space of small and mid-size academic physical libraries? If thoughtfully done, I believe yes. But this doesn't mean I'm suggesting to "delete" the library itself. Instead, I propose we recraft it in largely digital form to successfully create an environment that is more helpful and more accessible to our patrons, and that contains more content than previously imaginable. It's not that the library is nowhere, it's that it is everywhere. To do this we simply don't need a warehouse to store a legacy collection of paper. As finances are closely watched, as resources are carefully meted out, let us converse now; let us plan well today for that new library of tomorrow.

Let's lean in and meet our administrators at the table before this decision is made on behalf of the academic library, while we still have a moment to bargain. Before the decision-makers observe and point to the denouement of print, let's cultivate and construct the outcome. Take the building, yes. Make it into a dorm (how many of those will be needed with the rise of MOOCs and the expansion of online education more generally?), a student center, faculty offices. Give the library a small, thoughtfully constructed space. A few offices for a handful of staff, space to teach, to tend to special collections, manage a digital repository, and any print titles deemed essential. In exchange for that valuable real estate,

let me—the librarian—give you a healthy list of digital collections that would benefit our institution’s researchers.

At a recent parent orientation to kindergarten at a nearby elementary school, the principal began by saying that the school’s curriculum “is that of any school, to create lifelong readers, writers, mathematicians, and researchers.” Research is an acknowledged integral skill in today’s fluidly digital world. Accessing, extracting, and distilling information from the digital universe are all components of being a successful member of our species. These are the skills developed and taught by academic librarians. Digital collections—accessible anytime, anywhere—provide the content in which students (our species) execute these skills. No longer necessary, then, is a behemoth of brick and mortar. Essential now are the digital collections and the research skills taught and imposed upon them.

As David Bell (2012) said in his *New Republic* article “The Bookless Library”: “Don’t deny the change. Direct it wisely.”

Welcome to the ivory pavilion. ☺

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ABOUT THE AUTHOR

Lura Sanborn is the research and instruction librarian at St. Paul's School in Concord, New Hampshire. She is the author of an assortment of articles on e-books and library instruction, as well as a chapter in *E-Learning in Libraries: Best Practices*, ed. Charles Harmon and Michael Messina (2013). She continues a decade's worth of reference reviews for *Library Journal*, to which she contributes the annual "Best of Databases" feature. She is looking forward to blending her two dominant areas of interest, digital libraries and digital education, while earning her CAS in Digital Libraries program at the Syracuse iSchool.

Online Reference Systems

Putting the User at the Center of Design **by John G. Dove**

IN THE LOBBY of the Encyclopaedia Britannica building in Chicago, inscribed in marble, is the first sentence of the preface of the 1771 first edition of this iconic work:

Utility ought to be the principal intention of every publication. Whenever this intention does not plainly appear, neither the books nor their authors have the smallest claim to the approbation of mankind.

At the end of her career, my mother worked for about ten years as a library researcher for Encyclopaedia Britannica in Chicago. It is no surprise, then, that my career in online information systems would eventually lead me to online encyclopedias. I am also one of those few people who takes the time to read the prefaces of reference books. As former CEO and then president of Credo Reference, I have needed to familiarize myself with the intention of reference books of all kinds and always be on the lookout for how the creator of a reference book envisioned it being used. Reference books and textbooks are the two types of book for which a very particular use or workflow is envisioned; a reference book's preface will often indicate who the intended audience is and what special design features are intended to improve its utility.

The purpose of this article is to introduce the reader to both the general principles of user-centered design and its application to online reference works. The

article does not provide a complete description of all the tools and techniques used in user-centered design but enough to give you a sense of the topic's scope. I discuss three companies that serve as examples of ground-breaking work that has led to significant innovations of reference products. With each company, I highlight specific aspects of its user-centered approaches when designing products used for online research. For the serious student or practitioner of user-centered design in online reference systems, I've also assembled, with the help of others, an annotated list of books and resources for more background on the subject ([see page 31](#)).

The Basics of User-Centered Design

Terry Winograd, professor of computer science at Stanford University, is one of the top leaders in human-computer interaction. For a dozen years, he has collaborated with the Institute of Design at Stanford's "D School" to present a course on the design of computer- and telecommunication-based applications. All courses in Stanford's Institute of Design are presented as a collaboration between the D School and other schools or departments at Stanford. So the Computer Science Department, the D School, and a third school or department make it a three-way collaboration. The course participants are grouped into teams with someone from each of the other groups. And three becomes four when the teams link up with an external organization.

I've been lucky to attend the end-of-course presentations for two of these courses. The first was a collaboration with Stanford's School of Education, which recruited an inner-city elementary school with the objective of developing computer games that would be supportive of the curriculum. The second was a collaboration that included the Political Science Department and the Law School. They then recruited students and faculty from the University of Nairobi in Kenya and obtained sponsorship from Nokia. The task in this case was for student teams to create applications of cell-phone technology that would demonstrably and cost-effectively improve the lives of people in the slums of Nairobi.

One of the striking things about both of these classes was to see how students worked toward creating solutions that could be measured in multiple aspects of usability. Each student team had to report on how their proposed idea would demonstrate:

- emotional appeal to the likely users of the product or system;
- measureable effectiveness of the design functionality;
- economic feasibility of the solution; and
- alignment with cultural factors of the intended users.

Often in the process, an effective design had to take into account that there was more than one user. For example, a proposed cell-phone app for encouraging expectant mothers to attend the prenatal appointments had to be easily used

both by the pregnant women and by clinic staff who would help personalize the app.

In reference products for libraries (defined here as online platforms housing various types of content used in research, including A–Z encyclopedias, dictionaries, chronologies, etc.), one has to consider the design, usability, and appeal of the product for students and patrons, as well as the administration of the product by members of the library staff. A large university library can have as many as 2,000 databases available to their students and faculty. On the other end of the spectrum, a small community college is likely to have dozens of online resources for their students, but, in some cases, only a single librarian on staff. So a deciding factor in whether a product’s “user-centered design” will do well in both environments is how easy the product is to administer and integrate with other library resources.

Adding a new online reference product to the suite of online tools available in a library raises lots of questions about the interfaces to authentication systems, usage reporting tools, linkages to and from OPACs and learning management systems, participation in metasearch and discovery tools, and many more.

In some cases, understanding that there are multiple groups of users may allow for a completely different approach to the economics of providing an effective reference resource. Two e-resources that stand out in this regard are [Birds of North America](#) and [The Encyclopedia of Life](#). Their creators have recognized that there are multiple groups of users who can be served by (and in return, can serve) the collective asset represented by the two encyclopedias. Both have very different functionality for amateurs and scientists. Alan Poole, editor of *Birds of North America for the Cornell Lab of Ornithology*, calls this system “wiki with gates.” They’ve found that they can provide a specific user experience for individual bird enthusiasts and charge a subscription fee, which provides significant revenue for running the whole effort. But they also provide functionality for professional ornithologists through partnerships with the AOU (American Ornithologists’ Union) and the OSNA (Ornithological Societies of North America).

From what was originally an eighteen-volume print encyclopedia (completed in 2002), the Cornell Lab has created a living, up-to-date e-resource with appropriate contributions from bird enthusiasts, scientific researchers, and specifically designated editors and reviewers. The subscriptions paid by individuals and the support of the professional associations combine to make the effort economically sustainable. But this could not have worked out if they hadn’t recognized the differing needs, interests, and resources of each audience.

The Encyclopedia of Life (EOL) traces its origins to the appeal from E. O. Wilson in his March 2007 [TED Talk](#) for documentation of all known species in a single online resource. EOL is a free resource, but it also implements Poole’s idea of “wiki with gates.” Different (albeit related) functionality is available to general visitors, more serious enthusiasts who have registered with EOL, and those who have applied to be, and have been accepted as, curators of EOL. Communities of users interested in specific topics are also able to share ideas and propose specific improvements to this ever-growing work.

To provide a fuller picture of how various companies put the user at the center of design, I've chosen the three recognized for their innovative work with online reference resources and have interviewed key players at each: Tom Beyer of iFactory, known for building many of the award-winning reference platforms for a number of well-regarded publishers; Nancy King of Credo Reference, known for its aggregation of high-quality reference works; and Erin McKean from Reverb, known for having built the Internet's largest online English dictionary and a set of application development tools used to imbed that dictionary in other applications.

iFactory

BACKGROUND

iFactory has built numerous reference sites for Oxford University Press (OUP) and continues to do so, including such online products as the Dictionary of National Biography, Oxford Reference Online, and Oxford Bibliographies Online. iFactory has also built online reference platforms for other academic publishers, including SAGE Publications, Columbia University Press, De Gruyter, and Bloomsbury Publishing. In 2010, the company launched its own white label platform, PubFactory, to incorporate the elements it identifies as important when building customizable reference products.

Tom Beyer is director of platform services at Safari Books Online, which purchased the PubFactory group at iFactory in early 2013. Tom received a BA and an MS in computer science from Harvard and Brown, respectively. Back in 1999, Stanley Katz, the president of the American Council of Learned Societies, was looking for a new publisher to take on the publishing of the American National Biography. He allegedly insisted that an essential requirement was that the prospective publisher commit to providing an online version of the iconic biographical dictionary. OUP got the bid. The product manager at OUP charged with the mandate of coming out with an online version was a friend of Tom's, and she called him to get advice about whom OUP should count on to build such a system. "That's how we got into this business," says Tom, "[it all started with] Oxford's American National Biography."

IFACTORY'S CHALLENGE

Since iFactory is a development house, it usually wins an assignment to build a reference platform after the publisher already has defined its audience and its unique needs. iFactory needs to find ways to bring the concerns of the user into the process somewhat after the fact. One way it does this is through exemplary user testing implemented as early in the process as possible. This early testing exposes difficulties to the development team before the system is fully built.

IFACTORY'S APPROACH

Below are the highlights from my conversation with Tom about what makes iFactory's model unique.

John: What early techniques does iFactory develop to define user needs?

Tom: It feels like we can never get in early enough. Oftentimes, we find that simply the questions we ask make it clear that we need to be involved right from the beginning, because we are asking things that the publisher has not anticipated, or we have definite opinions about particular pieces of functionality and can back up our opinions with specific data from the field. We also always advocate a requirements analysis and design phase as part of the development project. It is critically important to understand the kind of data involved and the ways in which the users will be interacting with the data to understand how to build an appropriate interface for the product.

John: Can you give an example of how a user test necessitates that you "go back" and redesign a feature?

Tom: The Dictionary of National Biography (DNB), for example, has five different advanced search forms (this was before we discovered that users hardly ever use advanced search). We were having trouble coming to an agreement about the best way to code the input fields for dates—OUP wanted to allow users to put in dates at varying levels of specificity and to support both single dates and date ranges and for the system to make intelligent inferences about user intent when the fields were partially filled in. We put together a quick example of the two leading contenders for the interface and tested these with users. It quickly became apparent that one was significantly easier to use than the other. We've gotten to the point now that we don't even bother to argue about it; if there seem to be a couple of obvious solutions, we will quickly create a survey and send it out to a bunch of users. The data that we get back usually makes it clear which is the better solution.

John: This brings up the increasing importance of empirical data to test a system under development. Can you elaborate on what methods/techniques have been most beneficial to iFactory and its clients?

Tom: It is critical to make sure that sites are coded so that it is easy to see how users are navigating them and what features they are using. This is a huge help in improving existing sites. We are making increasing use of A/B testing as well. And during development we use quick surveys as a mechanism to prove out particular user interface elements.

John: What is uniquely relevant to reference content that impacts your approach to user-centered design?

Tom: It is important to remember that reference sites are not generally destination sites in and of themselves. Of course, there are reference sites such as the Oxford English Dictionary, where the brand is so great that the user does generally search out the site itself, but for most reference sites, users first arrive to it after doing an external search, either via Google or via a library discovery service. That means that it is critically important to orient them to the site from the page from which they “entered,” which is most likely a piece of content. It is also critical that it is easy to get from that piece of content to other related content, since there’s a good chance that the user has not landed on the exact page he was looking for. Consequently, the following things are important for reference sites:

- They support deep linking.
- They are easily discoverable both from external search engines, such as Google, and from library discovery services and from any other external services that users of the content are likely to be using.
- The content page gives a sense of the site and the authority of the content.
- There is a rich set of metadata that helps the user contextualize the content.
- The content page provides a variety of links to other related content using different relatedness criteria: similar subject matter, disambiguation (did you mean Mercury the god, mercury the element, Mercury the planet, etc.), more detail or less, etc.

Credo Reference

BACKGROUND

Credo is an information skills solutions provider that serves educational institutions worldwide. Its mission is to build customizable research platforms that enable the flexible configuration of content, technology, and services for the purpose of connecting learners, faculty and teachers, librarians, and publishers.

In her role as product manager for Credo Reference, Nancy King has been instrumental in bringing the “voice of the user” into all aspects of the development process. She has overseen several significant redesigns of the platform, which have improved the user experience of Credo’s product lines, including the General Reference product and the Literati offering. Nancy received both her BS and MA from Carnegie Mellon, studying technical writing and communication planning and design. She then went to work at Gomez where she was director

of design, before heading out on her own as an information architect and web designer. She then got an MLS degree at Simmons College. This is not the typical career path for a web designer and information architect—but it is a perfect path for a designer of online reference systems sold to librarians.

CREDO'S CHALLENGE

One of Credo's key challenges is the creation of an online user experience that brings the best presentation of information from a wide variety of publishers and content types. Reference content and a user's experience of that content in print can be very different from one content type to the next, or even from one title to the next. English language dictionaries, bilingual dictionaries, subject-specific dictionaries, general encyclopedias, atlases, gazetteers, handbooks, and the flagship of reference, subject encyclopedias—all of these content types demand a very specialized user experience if handled book by book. But a book-by-book design would be confusing to the user and would fail to bring out some of the inherent advantages that Credo has as an aggregator of content. By creating a more generic interface for reference content across different "book" types, Credo affords users the ability to seamlessly follow the best path of inquiry across various resources within the Credo platform as well as within the myriad other resources in the library.

CREDO'S APPROACH

To define the best user experience, Credo gathers input through focus groups as well as user testing. Focus groups help provide direction on the ideas being pursued and validate product choices. The company's user testing takes two forms: online testing with remote users and in-person testing. Credo regularly gathers feedback through remote testing, while in-person testing happens with each new product or major feature release. These usability tests help identify any problem areas of the platform and provide insight into the user's impressions of the product.

Especially important to Credo's design of these user experiences are Nancy's interviews with potential users. "Our process brings together the wants and needs of the end user and librarian with our strategic objectives," says Nancy, adding, "Finding librarians or end users to include is never a problem for Credo. Our customers are always willing to get involved and contribute their opinions, whether it's meeting at a conference or coming into the office for a focus group. For the end-user perspective, we regularly have college students working as interns in our Boston office, and they, as well as classmates they've recruited, have provided input regularly."

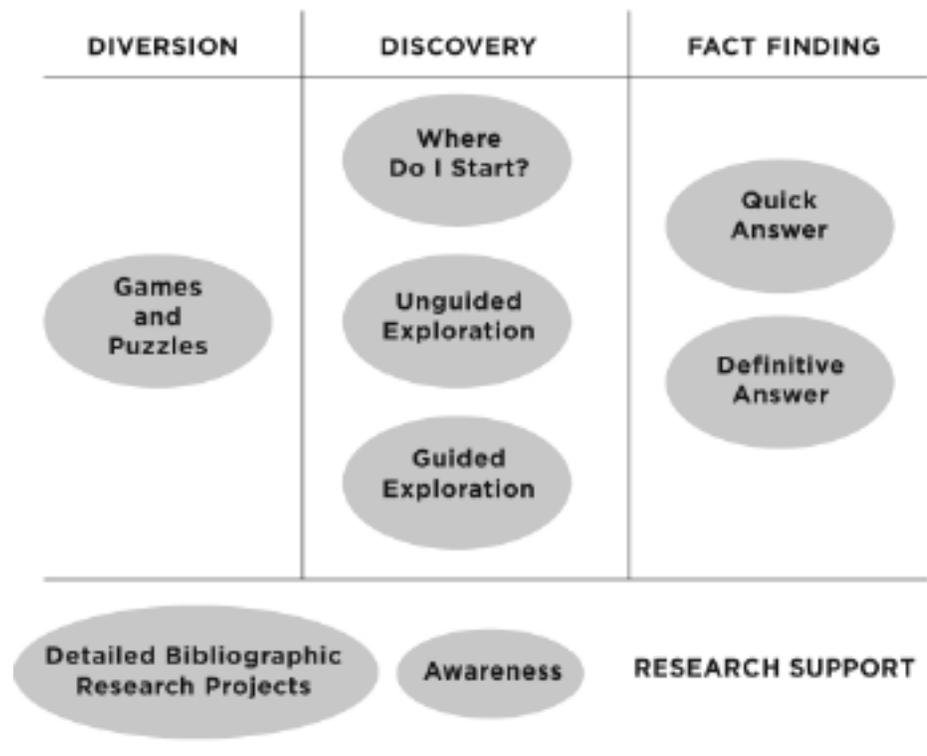
Over the years, Nancy and I have found it useful to have a framework with which to communicate regarding the expectations that users have when asking a reference question. We call this framework the Modes of Reference.

It is not unusual that different users will have different search patterns and behaviors. An example common in many software products is distinguishing between “experts” and “novices.” Some of the things a novice needs to get their bearings become cumbersome if they continue to be part of the user experience for the expert user. Credo’s Modes of Reference is not about a division of users into different classes; rather the modes represent different states of mind of the user, dependent on the nature of the task he or she is trying to accomplish.

For instance, is the user looking for a quick fact? If so, how important is the source of that fact? Perhaps they are in a more exploratory state of mind and not sure exactly what they are looking for. Perhaps they are ideating over a topic to choose for their research project. Perhaps they are seeking guidance that will take them through a complete topic of study. Credo’s Modes of Reference has eight modes, and each differs in terms of the user’s goal, their concern about sources, and their tolerance (and even delight) or abhorrence of false-negatives or false-positives. We’ve captured this set of eight modes through our extensive interviews with and observations of users and our discussions with reference librarians.

The modes divide into four major categories: Fact-Finding, Exploration, Diversions, and Detailed Bibliographic Research. Credo has chosen to focus a

FIGURE 1.
Modes of Reference



Credo's Modes of Reference framework identifies the expectations that users have when asking a reference question.

very large percentage of its time on the Exploration modes, including guided exploration, unguided exploration, and a particularly important mode: “Where do I start?” One of the key things about these modes is that users are not aware that they are in one mode or another. The transition is often facilitated by a choice the user is offered that invites them into a change of expectations. Names of links and buttons can let users’ self-select for the mode that would meet their needs. If a user is offered a link that says “Show me the details,” they are not likely to be thrilled with lots of false positives and unnecessary clutter. But if that same user clicks on a button that says “Surprise me!” they are clearly willing to have serendipity prevail.

Reverb Technologies

BACKGROUND

Reverb and its online English dictionary, Wordnik, were inspired by founder Erin McKean’s 2007 [TED talk](#), in which she laid out what a dictionary could be if “born digital” and freed from the design constraints of print dictionaries. In Erin’s own words, “Back then, we were called Alphabeticall, Inc., but we changed the name to Wordnik when we launched the world’s largest English language dictionary site, Wordnik.com, in 2009. As we’ve expanded from single words to blog posts and beyond, we’ve changed our name again to reflect our focus on the effect of connections between words. At Reverb, our focus has always been on blending technology and words to give readers the most meaningful experiences possible.”

Before founding Reverb Technologies, Erin (BA/MA, Linguistics, University of Chicago) was editor-in-chief of American Dictionaries at Oxford University Press. She is a prolific author: a former columnist for the *Boston Globe*’s column “The Word,” editor of the semidefunct, not-so-quarterly journal, VERBATIM, and author of a number of books including the series, *Weird and Wonderful Words*, a novel *The Secret Lives of Dresses*, and the recently published *The Hundred Dresses*, a field guide to dress archetypes. She leads a double online life both as a leading lexicographer and as a blogger for [A Dress a Day](#). She also claims to be bad at Scrabble (but I have my doubts).

REVERB’S CHALLENGE

Reverb’s success is centrally dependent on the ease and effectiveness of having their technology embedded in other applications and products. This means that their users are coming to use Reverb’s Wordnik dictionary in the midst of another product’s workflow. It also means that an important group of users that Reverb needs to understand and support are the developers who decide whether, and how, to integrate Reverb’s Wordnik API capabilities within another application.

REVERB'S APPROACH

A common tool used to focus a design process on the needs of specific users is that of “personas.” These are often elaborately drawn descriptions of individual groups of users describing whole persons, their daily life and preferences, and their likely interactions with the system being designed. Personas have played a central role in Reverb’s ongoing development work. They already had significant experience using personas to focus their design process when they decided to step up their game and train several of their key staff members in a workshop program called LeanUX (provided by the company [Luxr](#)). Erin describes some of Reverb’s personas as follows:

Our personas include “confirmers” who come to Wordnik to complete their understanding of a word’s definition and use. Then there are the “explorers.” They come to Wordnik to find out more about a word. Usually they want related words, they want synonyms, thesaurus-type data, and they want to look at words in the same universe as the word. That’s where our lists really help. They will come to Wordnik and find that there is a list of all these different kinds of words, and then they’ll dive in and jump from one list to another. They like browsing, and we believe they come to Wordnik for particular words but then they get lost and they stay for a while.

Then there is a group that we call the “collectors.” We have a couple of different collector personas, and one is the “student collector.” They make lists of GRE words; we have lots of GRE word lists that are all user created. They might save some of their favorite words and they might save some words they look up a lot, but that’s the extent of their collecting.

There are also the “super collectors.” The super collectors make lots and lots of lists, several dozen lists. Some are topical like lists of kinds of breads. Others are characteristic lists such as all words that have four consonants in the middle. The people that are the super collectors tend to make their lists open so that other people can add to them.

Each list has a title and a description and then comments on the list which attract other users. One of my favorite examples of the super collector list is the sweet-tooth-fairy list. It’s a collection of overlapping bigrams where the word in the middle is in both bigrams. So free-throw and throw-rug is free-throw-rug. And so they make these great mental images, and the guy that started the list, he’s a character actor and he’s a grandfather, and he has a second career playing grandfatherly roles. He started this list, and it includes 3,000 or 4,000 items by now. Then imagine you’re a writer and you’re going to Wordnik to find a better word and you stumble across the Sweet-Tooth-Fairy list. This list is not going to help you with your college essay. But if you fall into it and you’re the right person, you end up thinking about Sweet-Tooth-Fairy all day long

and end up coming back just to see what additions there have been to the Sweet-Tooth-Fairy list since your last visit.

The “English language learner” persona is one that we looked at and then realized that we don’t have the resources right now to do things specifically for learners of English. So we acknowledge their use and we don’t go out of our way to make their lives harder, but we also have not invested a lot in feature development targeted for ESL. This is mostly because we know there are a lot of great online dictionaries for ESL people, like Cambridge, McMillan, and others which are really targeted at that market.

Now we even have two API personas: Sanjay and Dave. Sanjay works for a startup. Sanjay is maybe in college and maybe building his own app, or he’s a new developer at a startup and he is coding when most things are closed. In the middle of the night, he’s got this great idea; he wants to finish it. He’s in this creative flow state, and he wants to put a dictionary in what he’s building and he doesn’t want to send an email to a business development person and ask for permission and wait to get approval and wait to get his key. So the way that the API works is that you sign up and you get your key by return email; no speed bumps. By the time everybody wakes up in the morning, he will have built his app. I know this persona is accurate because I get all the emails from the people who have questions about our API. I get a lot of e-mails that are time-stamped at three in the morning asking about our licensing requirements. They have just built it and now they want to know if they can release it into the world, and they missed the link on our site that says here are all of our terms and here are all of our requirements. That’s why they are e-mailing me.

Dave is the other API user persona. He works for a much bigger company and his boss asked him to look at the Reverb Wordnik API. Now Dave’s got a zillion things to do, and he has a manager who doesn’t quite understand what’s involved with anything. From his manager’s point of view, there is a word he’s heard of, API. And he asks Dave to “do it.” What we want it to be for Dave is the one time where his manager is right. It is actually as easy as his manager said it was. And so that’s why we have Swagger, which is our API description framework. On our developer site you can test any call; you can see all the parameters; you can put in any data you want; and, you get the sample response back. There are no surprises when using our API because we want Dave to be able to go home at six o’clock and see his kids. Dave can test it before he finishes it; our documentation is always in sync and you can sandbox test anything that you want on our developer site. We want it to be the easiest possible API. In fact, we open-sourced the Swagger framework for doing this within the API so that our documentation is always in sync with what the API actually does.

Erin has had significant design experience in both print reference works and online reference and app design. When asked about the differences between user design in print vs. online worlds, she gives the following response: “In the print world, we tried to design with an eye on being utilitarian, to think what would be the greatest good for the greatest number, and then design that user experience in the book. On the web, I can solve more people’s problems at once and I get feedback much faster. We make a change and that day I get email from someone who either loves it or hates it. On the print end, how many months elapse between sending the final files to the printer and to the store? And there is no undo button. I can’t revert to the earlier code, like I can with an online product, and say, ‘oops, that was a mistake.’”

In print publishing, even if you tested something for months and were convinced you’ve got the best possible thing, you can’t test it on everybody. On the web, you can test it on everybody or even half of everybody. You can also A/B test it. And then it’s a real-world test.

Looking Forward

The conversations with Tom, Nancy, and Erin bring me back to that first sentence of the preface to the first edition of *Encyclopaedia Britannica*: “utility ought to be the principal intention” of every product sold to libraries. These are exciting times for creators of reference products, who must keep up with ever-evolving tools and contexts to meet the needs of researchers in the twenty-first century. Yet as far as they have come in recent years, there is more to be done. I look forward to seeing more innovations come out of the efforts underway that will continue to enhance the user experience of these and other reference products.

From iFactory, I look forward to seeing developments with the online version of the *Dictionary of Regional English* (Harvard University Press). This iconic work in the study of regional speech and language patterns has been developed continually for the past fifty years. As much as I am a fan of the print version, I anticipate much greater utility with the online version.

From Credo, I look forward to seeing the company use its aggregation of multiple reference sources as a foundation for building a set of advanced (and customizable) services that will help libraries promote life-long learning and information literacy.

From Reverb, I look forward to seeing what the company is able to do to capture people’s enthusiasm for specific words and phrases and use them as a window into the network that is the World Wide Web.

I predict that the next decade will see reference content play an instrumental role in eliminating the speed bumps that library researchers still experience today and that the techniques employed by the three companies profiled in the

article as well as by other library vendors will help make paid-for reference content as seamless as web-based information tools are on the open web. ☺

ABOUT THE AUTHOR

John G. Dove has worked for Credo Reference for the past ten years, first as CEO, then as president, and now as senior publisher. John has extensive experience in technology businesses including electronic publishing and online education. In 1968 he joined a start-up on Wall Street that produced the first end-user accessible online database of stock market information. In the early 1990s, he was on the executive team of a Boston area consulting firm, Symmetrix, which was instrumental in building learning organizations and electronic performance support systems to back them up. Subsequently, he was president and COO of SilverPlatter, a supplier of electronic and online bibliographic information to research libraries worldwide.

resource shelf

Where To Turn for Background, Context, Ideas, and Inspiration on User-Centered Design of Reference Systems

by John G. Dove with Terry Winograd, Erin McKean, Jodi Wing, and Josh Orum

Classics of Reference Content and Reference Librarianship

Green, Samuel. 1876. "Personal Relations between Librarians and Readers."

Library Journal 1 (October 1876): 74–81.

Green's article never really mentions the word "reference," but it clearly visualizes a set of a dozen or more library patrons and identifies the right service interaction to have with each. In some cases, these imagined patrons learn a skill for future self-service at the library; in others, it's about quickly pointing out the one book in the library that will delight them or be useful in their research.

Janes, Joseph. 2003. *Introduction to Reference Work in the Digital Age*. New York: Neal-Schuman.

Before describing the challenges and opportunities that the digital world offers to implementation of good reference services, Janes provides an extensive survey of the history and theory of reference and user services. Especially valuable for the design of online reference systems is his description of the work of Robert Taylor from the 1960s, identifying five elements of context surrounding the reference interview. These are just as relevant to today as they were in the predigital age.

McArthur, Tom. 1988. *Worlds of Reference*. Boston: Cambridge University Press, 1988.

This book covers the history of reference content over the past 2,000 years. Ever wonder who came up with the importance of multiple learning styles and applied those principles to a reference book in the mid 1600s? Ever wonder why people at the pinnacle of their careers often put their great effort into writing a subject encyclopedia that ends up being a seminal work for the next couple of generations of researchers in that field? McArthur's vision of the future comes from the vantage point of 1988, so it is not distracted by the specifics of Second Life or other fads. Instead, it is based on human principles relevant at any age.

Ranganathan, S. R. 1961. *Reference Services*. London: Asia Publishing House.

Ranganathan is most famous for his *Five Laws of Library Science* and is featured in the first chapter of almost any introduction to library science textbooks. After all, he apparently coined the term "Library Science." Worldwide he is most recognized for his unique classification scheme based on facets. This scheme has had a rebirth of importance since it is the same approach that underlies most "faceted-based" search models of many modern websites and online tools. In this book, Ranganathan says that as he looked forward in his career he knew his success required three things: coming up with a new classification system, implementing such a scheme in a real library, and creating a library with an effective set of reference services. Reference Services was so important to him that he purposely hid it from view in his first several budgets so he wouldn't have to advocate for it before stakeholders had experienced first-hand how important it was in the functioning of the library.

Classics of User-Experience and User-Centered Design

Cooper, Alan. 2004. *The Inmates Are Running the Asylum: Why High-Tech Products Drive Us Crazy and How To Restore the Sanity*, 2nd ed. Indianapolis, IN: SAMS.

This classic shows why it takes an organizational commitment right from the top of the organization to effectively embrace user-centered approaches to design.

Kelley, Tom, and Jonathan Littman. 2005. *The Ten Faces of Innovation: IDEO's Strategies for Defeating the Devil's Advocate and Driving Creativity Throughout Your Organization*. New York: Currency/Doubleday.

Kelley is one of the top industrial designers in our time, who previously authored the bestselling *The Art of Innovation*. Here he shows that design is a team effort bringing together a diversity of talents (e.g., the “anthropologist”).

Krug, Steve. 2005. *Don't Make Me Think: A Common Sense Approach to Web Usability*, 2nd ed. Berkeley, CA: New Riders.

If you read and truly implement what Krug suggests in chapter 9 (“Usability Testing on 10 Cents a Day”) of this book, you will make a big difference in the user-centered development process at your organization—and with very little cost. According to Krug, “User testing—done simply enough—is the cure for all your site’s ills.”

Moore, Geoffrey A., and Regis McKenna. 2006. *Crossing the Chasm: Marketing and Selling Disruptive Products to Mainstream Customers*. New York, NY: Collins Business Essentials.

This book shows that many innovative products fail to make it into the mainstream because they don’t embrace solving 100 percent of their users’ needs. Moore’s section on Scenarios, aka “Target Customer Characterization,” shows how taking on “whole product management” requires looking at factors beyond the software, including wrapping the tools inside a set of services so that the buyer gets their problem solved.

Morville, Peter. 2005. *Ambient Findability*. Sebastopol, CA: O’Reilly Media.

Morville, the author of the influential *Information Architecture for the World Wide Web*, here addresses what has to be a concern of anyone building an online reference resource today: how is a prospective user going to find your wonderful resource? Those who blindly follow the hope of “if we build it, they will come” are almost always cruelly disappointed.

Norman, Donald A. 2002. *The Design of Everyday Things*. New York: Basic Books.

This classic in designing products that have the user in mind has enduring value. Using metaphors like “the handle and the blade,” Norman’s principles are memorable. Readers will be continually amazed to learn from this book that apparently those who have designed such things as a TV remote and many other gadgets in our lives have never read a book on product design.

- Tufte, Edward R. 1990. *Envisioning Information*. Cheshire, CT: Graphics Press.
- . 1997. *Visual Explanations: Images and Quantities, Evidence and Narrative*. Cheshire, CT: Graphics Press.
- . 2001. *The Visual Display of Quantitative Information*, 2nd ed. Cheshire, CT: Graphics Press.
- . 2006. *Beautiful Evidence*. Cheshire, CT: Graphics Press.

Tufte is a towering figure in the field of graphical display of information. His examples transcend media. All four of these books need to be on your shelf and referred to frequently if you are in the business of designing reference products for libraries. Tufte's one-day course, offered every year or so on the east and west coasts, is also well worth the time and money—and these four books are provided to every attendee.

- Winograd, Terry. 1996. *Bringing Design to Software*. Boston: Addison-Wesley / New York, NY: ACM Press.

This compendium has essays by many of the early leaders in applying principles of design to software including, among others, David Kelley, Don Norman, Sarah Kuhn, Paul Saffo, John Seely Brown, and Mitch Kapor.

Modern Textbooks on User-Centered Design

- Goodman, Elizabeth, et al. 2012. *Observing the User Experience: A Practitioner's Guide to User Research*, 2nd ed. Waltham, MA: Morgan Kaufmann. Looking for research to back up the principles of design for usability? This is the bible on the subject.

- Klein, Laura. 2013. *UX for Lean Startups: Faster, Smarter User Experience Research and Design*. Sebastopol, CA: O'Reilly Media. Klein, an experienced engineer and designer, focuses on helping startups learn more about their customers, providing an introductory overview of user experience (UX) and discussing ways in which to design an easy-to-use, effective product.

- Preece, Jenny, et al. 2011. *Interaction Design: Beyond Human-Computer Interaction*, 3rd ed. Hoboken, NJ: Wiley. This is the standard text Terry Winograd uses in the introduction to his popular user-centered design course.

- Saffer, Dan. 2009. *Designing for Interaction: Creating Innovative Applications and Devices*, 2nd ed. Berkeley, CA: New Riders. Offering perspectives from an expert on the subject of interaction design, this book shows how to use design research to understand behaviors and motivations and create a design strategy that makes a product stand out.

———. 2013. *Microinteractions: Designing with Details*. Sebastopol, CA: O'Reilly Media.

Saffer shows readers how to design effective microinteractions (the small details that exist inside features), learn the triggers that initiate a microinteraction, and help users understand the rules with feedback by using graphics and sounds.

Websites

Hot Studio: <http://www.hotstudio.com/thoughts/experience-design>

Creative Good: <http://creativegood.com/blog>

37 Signals: <http://37signals.com/svn>

NN Group: <http://www.nngroup.com/articles>

A List Apart: <http://alistapart.com/topics/user-experience>

Smashing Magazine: <http://uxdesign.smashingmagazine.com>

Zurb: <http://zurb.com/apps> 

Aggregation, Integration, Cooperation

The Three Imperatives of New York University's E-book Strategy by Angela M. Carreño and Bill Maltarich

FOR NEARLY TEN years the New York University Libraries have been designing, refining, and deploying a multiformat collection development, acquisitions, and discovery strategy for books. Because the book environment—particularly the e-book environment—is rapidly and constantly changing, this strategy remains a work in progress. Nonetheless, the principles from which we started, the methods we have employed to meet the goals these principles imply, and the difficulties we have encountered may prove instructive to other academic libraries. Although our dual-hosted e-book strategy in particular is idiosyncratic, a look at our efforts can highlight challenges faced not only by libraries but also their partners: vendors, publishers, and aggregators. In the end, we seek here to point out those problems in the hope of helping others avoid some pitfalls we faced. If some of our strategies resonate elsewhere, all the better.

NYU's decision to move toward an e-book-heavy collection development policy grew out of the local culture and a close consideration of the industry-wide climate. NYU Libraries needed to respond to the university's growth as a Global Network University¹ with a fledgling library in Abu Dhabi and plans for a branch in Shanghai in 2014. NYU was and is committed to faculty and students' ability to carry on the same sorts of research with the same collection of resources across all of NYU, regardless of physical location. Given the limited size of the libraries at these two international sites and the prohibitive cost of mirroring NYU's print collection, our options were two: shipping material across the world

or concentrating on e-versions of many, if not most, of our resources. With the transition to e-journals essentially complete, this meant that NYU's e-resource collection development policy would need to focus on e-books.²

In this environment we realized that our e-book acquisition would, at least initially, focus on the acquisition of backlist e-books from major academic publishers. These large purchases offered clout in negotiations due to their size and expense and had immediate and noticeable impact on our collections upon their completion, so they seemed the most efficient first acquisitions. Thinking through our needs and the options current at the time, we developed the three imperatives of our e-book strategy: aggregation, integration, and cooperation. Below, we describe these three strategic pillars and explain why they are necessary to found a successful collection strategy for monographs in multiple formats. Given the importance of these tenets, we next describe the tools and partners we have employed to fulfill our vision. Finally, we present the difficulties we have faced implementing this strategy and our plans for moving forward.

Aggregation

For every e-book title, we soon realized, libraries face the choice of multiple platforms for delivery.³ Quite often a title will be made available through multiple channels with multiple business terms on multiple platforms: titles are sold outright or leased; sold in collections based on publication year, on subject area, or sold individually; sold direct from publisher, through library vendors; made available through Patron Driven (also known as Demand Driven) access models and purchased individually only after some amount of usage, etc. The complexity of this environment is multiplied by the various permutations of platform and business model options.⁴ NYU determined early on that e-book titles scattered across multiple platforms caused problems for our internal workflows and, more importantly, for our patrons in terms of discovery and consistency of user experience.⁵ We also predicted that the sheer volume of content on an NYU e-book platform would make an aggregated collection a discovery destination for patrons.⁶

We first faced the choice of a platform—a task that ended up being simpler than we had predicted. NYU lacked the staffing, the mandate, and the inclination to develop our own e-book platform, so we had to search for vended solutions. We had been subscribing to an aggregated collection of e-books that was being rather heavily used despite some complaints about interface and DRM. Discussions with ebrary, the vendor for that collection, were fruitful: NYU would purchase e-books through various channels (including ebrary-brokered purchases), and ebrary would, for a fee, host those e-books on an ebrary channel available only to New York University. This would allow NYU to include e-books from publishers who did not work with ebrary (e.g., foreign-language publishers and holdouts among larger academic publishers).

ADDITIONAL ADVANTAGES OF AN AGGREGATED BOOK COLLECTION

We determined that in terms of serendipitous discovery, this aggregated collection of e-books would be a boon, but there were other reasons to seek an aggregated book collection.

A Broad and Quality Collection of Books

As noted above, we recognized that the size of the leased collection of books we had in place made the platform an e-book destination. By extension, we believed that by consistently adding quality content in quantity, the value of the site would increase. We also imagined that additional content would add to the “gravity” of the site, that is, its ability to attract e-book seekers.

Consistent User Experience

It was important to us that basic functionality such as navigation and search, as well as tools such as bookshelves, citation export, annotation, and highlighting be consistent across the e-books NYU purchased. This is possible when the books are available in an aggregated collection on a single platform.

Optimum Flexibility

Taking into account the rapidly changing e-book environment, NYU believed that keeping up with technological change across our books and integrating e-books into other library tools would be simplest if we had the option for a single platform solution rather than many solutions for each publisher platform. Having all of our purchased e-books in one file format on one platform would also make migration to an entirely new solution legally possible and technically feasible.

A prime example of the advantage of this single technical solution is the ability to download books to a device. Although many publishers do not offer this functionality, NYU’s platform, because it is powered by ebrary, allows for download to phones, tablets, and laptops for many titles. This has proven a boon to users and answered (if only in part) one of the most prominent complaints about e-book functionality at NYU across the majority of our books immediately upon its introduction.

Of course, the advantage of a single technology carries with it the universality of any technological disadvantages or limitations of the chosen platform. Because of this, we strive to be vocal contributors to our platform vendors development and improvement cycles.

Full-Text Searchability Across the Collection

Having the majority of our books available on a single platform would enable a native search on that platform to include the broadest possible range. It would also make mediated searching via API or index sharing a simpler prospect given the single source of this data represented by our platform. These considerations

led us to believe that an aggregated collection offered discovery advantages both within that platform and, potentially, via other systems.

Shared E-book Indexing and Technical Specifications

Although web scale discovery services offer a chance for aggregated search across books on separate e-book platforms, a single, institution-specific platform allows for indexing across the majority of that institutions books, including from publishers not included in the arrangements of specific search tools. The common indexing system, thesaurus, vocabulary, and technical specifications on a single platform should make search across books more efficient and consistent, even via one of those webscale tools. We also expect that having this platform simplifies maintenance as regards knowledge of full-text accessibility via any third-party tools, since we know that every book indexed from our aggregated collection is, by definition, available as full text.

Identifiers

A single platform also provides a single set of consistent book identifiers, a true boon in the current e-book environment. As we discuss below, these identifiers can aid linking, de-duplication of records, the association of electronic and print formats, and many other technical processes that rely on a unique match point associated with a book.

WHY DUAL HOSTING MAKES SENSE

As we began to explore the possibility of an aggregated e-books platform, we did not lose sight of the benefits of access on publishers' and other e-book platforms. There were several reasons to seek dual platform access—that is, to include access via native platforms alongside access via the NYU e-book collection.

Search and Discovery Across Genres

Many, though not all, publisher sites have consolidated their e-book and e-journal collections on a single platform. Some, in fact, have been banking on the value of this consolidation as a major value (JSTOR and Project Muse, for example), and we saw clearly the additional utility inherent in this move. Often researchers have little reason to prefer journal to book-length material and a search across both formats can prove fruitful, especially when a publisher puts out a large number of edited works, whose chapters are not often functionally different from journal articles. Our e-book aggregation strategy attempts to solve the problem of publisher/platform silos for e-books and access via publisher sites trades off an acceptance of these silos for the integration of the book/journal silos.

Citations and Links of Record

As we considered aggregating e-books we worried about false negative availability results based on links in citations to the standard platform for books rather

than to our NYU platform. Citations to books on publisher platforms, were we to license strictly for local platform access, would appear to our users as books that NYU has not purchased and currently there is no technically feasible option for redirecting those links and no publisher incentive for redirecting patrons to the books on our site. Links using DOIs and crossref still require information about the location of the specific digital object and can lead to the same sort of false negatives. There is currently no comprehensive, reliable e-books link resolver.

DIGITAL RIGHTS MANAGEMENT

In our negotiations for dual platform access we quickly discovered disparities in the application of DRM between what publishers would allow on their own platforms and what we could enable at our aggregated platform. In part this stemmed from specific publisher policies and in part this was the result of a need to apply a least common denominator DRM across the e-books on our platform. Although in concept it is possible to apply varied DRM by publisher to our collections, to date this has proven a technical and workflow challenge we are unwilling to undertake.⁷ In other cases, publishers are very liberal with DRM on their own platform and more restrictive for content available from aggregators. By making books available simultaneously on our platform and the publisher platform, our patrons can take advantage of the most liberal DRM available in either case.⁸

Perpetual Access and Preservation Rights

As a research library, NYU is concerned not only with access to content but continued and perpetual access to content. In order to guarantee perpetual access rights to the book content, NYU saw the need to deal with publishers directly. Book aggregators sell publisher content under different restraints, terms, and conditions from what publishers may offer when selling content directly, and certainly only publishers themselves have the authority to alter standard permissions as part of purchase negotiations.⁹

Clearly the aggregation and dual-hosting strategies NYU employs involve close cooperation and open communication with our aggregator platform and direct with publisher. The necessity of including print in our thinking, however, carries along with it the need to cooperate closely with a third entity—our traditional book vendor.

Integration

As NYU moved toward collecting e-books intensively, we quickly realized the importance of incorporating this relatively new format in the existing library environment. We planned our expansion into electronic books and designed our strategy with an eye toward the best possible integration of the new process into

selector workflows, into the processes for selecting print monographs, and into our ILS/discovery tools. In addition, we considered the importance of interlibrary loan, NYU branding, the new burden on our staff, and the consistency of the online experience of NYU libraries. We did not deem the latter considerations secondary in terms of importance, but because they required broader input and consideration than the former concerns, they were part of a separate process outside of our initial strategic planning.

PRINT AND ELECTRONIC INTEGRATION

NYU started our e-book collecting with the primary impetus coming from the university's expanding global presence, specifically in Abu Dhabi and, soon thereafter, in a planned library in Shanghai. The nature of these two international sites and the NYU mission demanded that NYU researchers at any NYU facility have access to a consistent breadth and quality of resources. Given the small size of the libraries at these sites and the cost of shipping material globally (which we have done and continue to do with great efficiency), we determined that overlapping print and e-book collections for backlist from major publishers was in the end the cost-effective means for serving our Global Network University.

For the continued collection of newly published books, we have initially been comfortable with overlap between new print and e-book purchases with the understanding that such duplication, which without other arrangements can mean paying on the order of 2.5 times the list price of material for unlimited simultaneous electronic access and the print format, was not sustainable in the long term. Therefore, we focused on two principle factors in the selection process: (1) avoiding duplication of electronic book purchases between centrally negotiated publisher packages and selector-driven book-at-a-time e-book acquisition; and (2) exploiting our backlist purchase experience to pave the way for format-specific acquisition of books as we move forward. It was immediately apparent that both of these considerations demanded the integration of our North American print approval vendor and distributor, YBP.

We reasoned that making information about our e-book purchasing centrally visible in the vendor's web-based acquisition tool, GOBI, was the primary way to avoid duplicate e-book purchases. Involving YBP in prepurchase package negotiations and in the acquisition of large packages of backlist electronic books, or, alternately, including them postpurchase through holdings loads in their system, we could ensure that selectors have up-to-date information regarding our purchases at the time of selection decisions.

The plan, growing from this reasoning, was to expand the workflows for retrospective purchasing to include ongoing purchases of e-books and print in tandem and thus allow our approval plans to exclude titles in print for which we had a standing order for an electronic version when that print was deemed redundant. Our initial plan was to begin with major publishers from whom we purchased what was effectively full press coverage and to initiate a process by which we had immediate access to electronic books as they were published on

the publisher platform. In addition, we sought access as soon as possible on our platform via file transfer from the publisher to ebrary when necessary and by transfer of a purchase list from the publisher or vendor to ebrary, where titles would be activated in our NYU channel, when possible. The only gap this would leave to fill would be titles available in print only and titles for which NYU wished to purposefully duplicate print and electronic coverage. Ideally, for those titles, we have sought a business model based on the historical model for electronic journals—a deep discount price (DDP) for additional formats.¹⁰

Practical considerations, a fluid industry in terms of business terms, and publishing patterns have made this vision difficult to fulfill. The primary issue is the lack of readily available information prior to and even at the time of publishing regarding format availability. For many major presses, NYU is unwilling to wait for format decisions from publishers before purchasing a book because we have experienced dissatisfaction and sometimes disbelief among our users when, for example, a title they have discovered via book review or publisher announcement is available for sale but remains outside our collection while we await format information. For most subject areas, then, we have kept our print approval plan intact and supplemented it with ongoing e-book purchases.¹¹ This model, however, is cost prohibitive and unsustainable, so we continue to tout the importance of simultaneous electronic and print publishing or, at the least, clear information at the time of publication regarding format availability.

The need for an integrated print and electronic purchasing plan and the demand for deep discount pricing necessitates the involvement of parties that understand the universe of available content and formats as broadly as possible. Publishers have not traditionally understood their print sales to libraries because of vendor involvement as distributors. E-book aggregators have no tradition of dealing with print for libraries and all that print purchases entail: producing order records and customized MARC records, shipping, returns, and, for many libraries, shelf-ready book delivery. Even if either of these parties could manage these tasks, print sales of North American imprints must be immediately, reliably, and accurately reflected in our current vendor system and integrated with print approval plans.

No party outside of our traditional library vendor has the wherewithal at this point to deal with these concerns, and hence YBP has been an integral part of our e-book purchasing, functioning as a pilot partner when they are directly involved in our e-book purchases as well as when they serve as the database of record for the relationship between our purchasing history and the universe of available books in any format.¹² We see this involvement as crucial to our plans to rationalize and economize the relationship between our electronic and print book purchasing patterns, both as one-offs via selectors or in packages with or without a deeply discounted print component.

INTEGRATION WITH OUR DISCOVERY ENVIRONMENT

The integration of e-book metadata into the discovery environment has served as the topic of multiple articles in the library literature and could easily stand as its own article in our environment, too.¹³ The following should point out some of the considerations, solutions, pitfalls, and concerns we've faced at NYU, where this integration has always been crucial to our e-book strategy.

Clearly, any electronic resource that remains unknown to the library's discovery systems (specifically the catalog, but also our link resolver, our metasearch tools, and our reference and public services staff) is effectively unavailable. For e-books, adding MARC records, as one example, equals in importance to actually having the physical book.¹⁴ It could be argued that for e-books discoverability becomes a much more integral part of both collection development (a decision to catalog a free resource, for example, amounts to collecting it) and acquisitions (in a very real sense, libraries do not "hold" materials until they are discoverable). Integrating these e-books may best involve new discovery tools and systems (although that is by no means a settled point), but even work with standard metadata formats like MARC takes on a new complexion and demands new techniques, workflows and skills from traditional cataloging departments.¹⁵

Two major differences are scale and workflow cues. MARC records for e-books often arrive in large batches but unlike in the process for print books, we cannot rely on physical cues to initiate and forward workflow. For print, the arrival of a box of books triggers workflow, and diminishing piles of books represent progress—e-books leave no trace in our physical environment to indicate necessity, difficulty, or success. NYU's dual-hosting strategy adds an extra wrinkle to the cataloging process since for each e-book we purchase there are at least two functioning and important URLs which should be included in our records and must be clearly distinguished for our users.

Our e-book purchasing falls into two categories: large purchases of e-books in backlist packages and ongoing purchases of newly released e-books through package arrangements, which most closely resemble standing orders. Each offers its own challenges.¹⁶

BACKLIST PACKAGES AND BATCH RECORD WORKFLOWS

Given NYU's global presence, we've focused on supplementing much of our backlist print holdings from major publishers with e-books. This makes financial sense given the cost of shipping books across the globe and the discounts available when books are purchased in large quantities. It also makes strategic sense given our commitment to a consistent research experience across all NYU global sites. Workflows surrounding these purchases must focus on a few crucial benchmarks: title level reconciliation, MARC record quality control, inclusion of platform URL, usage analysis, and troubleshooting.

Title-Level Reconciliation

Although it seems elementary, we have found that we need to focus from the very initial stages of backlist e-book purchasing on a mutually confirmed, stable list of titles purchased confirmed by the publisher, any vendor serving as middleman, and the library. It seems glaringly obvious that date ranges of books included in a purchase (e-books 1995–2000, for example) are not sufficient for any aspect of collection development or discovery work, but quite often initial proposals for e-book purchases are described only in this rudimentary way. Title-level information is imperative: It ensures the value of the purchase, aids in cost-sharing analysis across subject funds and specific libraries (for example, in determining the expected contribution of a law library to a purchase), it is the foundation for ensuring delivery of books purchased, and it grounds ongoing discovery workflows.

Title lists first serve to determine the value of a proposed package of e-books: Overlap with the print collection, subject-specific coverage, knowledge of excluded titles, and simple metrics such as average cost per title clearly all depend on a transparent and mutually shared title list. A changing list of books covered by a purchase changes everything from the value of a package to the expected contribution from our libraries.

Comparison against title lists is the first step in our cataloging workflows, too. These lists must contain a functioning unique identifier that can be employed to match incoming MARC records against the agreed upon list of titles purchased. The first step in the cataloging process, then, is to compare the list of MARC records received with the list of books purchased. E-books cannot be considered a part of our collection if records for those books have not been received, so this comparison is fundamental to the collection development, acquisitions, and cataloging/discovery functions of the library.

It bears mentioning that books in a series and multivolume works prove especially thorny problems in this process. A note that a library has purchased all the books in a series does not serve the same function as a title-by-title list of those books, especially because we will expect these books to be analyzed—that is, cataloged as individual titles—during the cataloging process. Multiple volumes of a single work, each volume representing a separate e-book, pose the same difficulties: If the work is listed as a single title on the title list, cataloging must mirror this listing in order for basic comparisons such as title count versus record count to be reliable. Again, this is not always the case and often must be discussed and specified during the negotiation process.

Often, once the issues of multivolume works and books in a series have been settled, the remaining reconciliation process involves an identifier match across title list and MARC records and a more or less intensive back and forth with the publisher and/or vendor regarding missing, extra, or duplicated records.¹⁷ Once a title match from list to MARC records received has been confirmed (or conceivably alongside this reconciliation process), these batches of records must be analyzed for record quality. Depending on the workflow, cataloging or acquisitions staff must also ensure that two URLs for each book are included on the

initial record set or, alternately, that URLs for each book purchased on the second platform arrive, indicating that the dual-platform requirement at NYU has been fulfilled.¹⁸

MARC Quality Control

Once the initial accuracy of the match between title list and MARC records received has been assured, or is at the least being pursued, records received are analyzed for quality. NYU has determined that because of the large numbers of records received for these packages and the wildly variant quality of records depending on record source, our first priority is to limit the number of MARC record sources we need to deal with. For NYU, our primary sources of records are our aggregator, our historical book vendor, and OCLC collection sets. Limiting these sources, in theory, provides a template for analysis and more accurate expectations for quality. History has proved, however, that quality can still vary from set to set because the initial source of records, even for our preferred MARC suppliers, varies as does, correspondingly, record quality. Backlist purchases also often require that we deal with other MARC suppliers, often the publisher or platform from which the books were purchased. Free e-books, especially, often require that we manage record sets from sources outside our three preferred providers.

Regardless of the source, NYU's Knowledge Access and Resource Management Services Department (KARMS) reviews records for quality. Although we would prefer that all records loaded match our high internal standards, NYU has decided that minimum standards for batch loaded records can be below those of our internal cataloging as long as they serve basic discovery functions without damaging the reliability or functionality of our catalog as it stands. Intrepid bricoleurs, the Batch Record Loading Team uses MarcEdit, spreadsheet analysis, sampling techniques, and a focus on the previously mentioned problem areas (books in a series, multivolume works) in order to ensure that the records meet these minimum standards. Beyond this analysis work, the team focuses on open lines of communication with MARC sources (another reason limiting these sources seems wise) in order to improve records that fall below our standards or even to raise the quality of records that we have determined could be loaded but which we have also determined could be improved. The specifics of their techniques, experience, and ongoing workflow improvements fall outside the scope of this article but, it should be emphasized, are crucial to efficiently allowing NYU's population to discover, access, and use these e-books in their work.

In addition to the catalog, NYU has looked to promoting its platform among users, to the use of our SFX knowledgebase, and our A-Z and metasearch database tool (xerxes on top of metalib) in order to provide e-book discovery. To a great extent, the link resolver knowledgebase has proven ineffective for e-book discovery. Many of the sets of books NYU has purchased are unique to NYU, the content on our own platform is often unique, and e-book identifier chaos has led to thorny issues with matching across the print and electronic formats. For the time being, we seek to rely on our catalog, with a combination of records

loaded direct to our ILS (Aleph) and records loaded direct to the discovery layer (Primo), as the primary database for e-book discovery. Nonetheless, we believe that our aggregated e-book collection serves discovery, too, and that the sheer number of e-books available on our own platform makes this a go-to location for those seeking e-books.

Ongoing E-book Purchases

In many ways, the concerns relevant to collecting backlist e-books and to current collections parallel one another. However, because current collecting is without exception predictive, at least if the library wishes to have access to e-books from the moment they are available, there are additional difficulties related to ongoing collections. Ideally, integrating e-books into approval plans from a library's vendors would allow this current collecting, but vagaries in the publishing process, demands from library patrons for immediate access to newly published books, and complex pricing models make this option, at least in its current form, less than satisfactory for major publishers' output.

An e-preferred or e-only approval plan fails NYU's libraries in at least two important ways. First, because publishers often hold off on e-versions of books, often those they think will be of greatest interest to the academy, an approval plan that incorporates e-books in a way designed to avoid format duplication often involves a waiting period to determine if an e-version will be available. For crucial publishers, NYU has deemed this wait period unacceptable, especially because for the most part the books likely to be withheld from the e-format are the books that are heavily reviewed, of the most interest to our faculty and researchers, and hence subject to the most vocal demand.¹⁹

Second, books purchased via the approval plan, at least currently, do not incorporate the pricing discounts that annual commitments to e-book purchasing, by publisher, collection, or subject area, can bring. This means that instead of a discount from, for example, a list price of approximately 100 percent of the print list price, libraries can pay somewhere along the lines of 150 percent of list price per title for multiuser versions of e-books. The cost of this acquisitions method is unacceptably high, especially given the limitations above, which currently result in the library duplicating purchases in electronic and print formats. In cases of such duplication, the library is paying around 250 percent of list price for the content.

These circumstances have meant that NYU has pursued arrangements with publishers directly (or via our vendors, either the aggregator or book jobber) for ongoing purchases of e-books. These agreements are usually for the forthcoming year and extend up to three years. NYU agrees to purchase the e-book output of a publisher either for their full frontlist or for books published meeting certain criteria—usually subject coverage or availability in a specific publisher collection. Publishers who cannot know what their output will be for certain even for the upcoming year provide title counts and representative, prospective title lists. The library can then adjust print approval plans based on this prospective purchasing.

For NYU, adjustments to date have been limited to eliminating approval print in a few subject areas, specifically books assigned to Library of Congress science ranges and excluding package publishers in e-preferred approval profiles. The commitment to even a year's worth of titles brings with it a discount off list price. Our arrangements include dual-platform access and a commitment to work with both our aggregator (ebrary) and our approval vendor (YBP) to meet our workflow requirements. Dual platform access comes at a fee. Often either ebrary or YBP has assisted in negotiating these purchases and in those cases we expect their portion of the purchasing workflow to be seamless, although this is not always the case.

The model for these purchases depends upon negotiation—we have arrangements direct with publishers, via YBP, and via ebrary, as well as consortial deals that include our MaRLI (Manhattan Research Library Initiative) partners.

When YBP is central to the ordering process, the ideal workflow is as follows: Publishers release new titles over the course of the year and allow NYU-authorized users immediate access to books covered by our purchase. A deposit account is debited in amounts corresponding to the books received. On a regular basis, likely monthly, the publisher provides a list of newly released titles and their unique identifiers. YBP manages the deposit account and provides, as soon as possible, MARC records for the titles on this list. At the same time, a list of these titles goes to our aggregator for inclusion on the NYU platform—this may involve allowing access to NYU users for titles already available in the ebrary system or the delivery of e-book files unique to the NYU ebrary channel. Once books are available on our platform, the aggregator sends a list of NYU platform URLs matched with unique identifiers. NYU then systematically updates the previously loaded records with the platform URLs as they are made available. In this way, we have immediate access to books on publisher platforms, the books are discoverable via the catalog as quickly as possible regardless of the vagaries of dual platform hosting, and records are updated with NYU URLs as soon as they are available.

If packages run through ebrary rather than YBP, the process is similar: Publishers send regular updates of newly released titles to ebrary, NYU, and YBP. Purchases are reflected in YBP's GOBI ordering system, titles are activated at ebrary or, when necessary, files are delivered and loaded on the NYU channel. In these instances, ebrary provides MARC records for our purchases, again to NYU's technical specifications. Ebrary manages the ongoing deposit account. The primary difference is that while dual hosting often runs more smoothly when ebrary sits in the middle of arrangements, MARC records are sometimes delayed until books are available on the NYU platform.

Packages negotiated directly with publishers follow the same pattern, but, whereas in the two scenarios above, the party central to the negotiations takes on the burden of directing communication, file transfer, and list management among publisher, vendor, and platform, when NYU goes direct with publisher that responsibility rests for the most part at NYU. We ensure that files are delivered and loaded to our platform and that holdings are represented in the GOBI

system. In addition, NYU must ensure that identifiers in publisher title lists match uniquely with YBP and ebrary information. This is sometimes troublesome as lists may include ISBN, ISBN 13, eISBN, or eISBN13, titles often have not only these differing ISBNs, but multiple ISBNs or, occasionally, duplicate ISBNs.

In part because of this identifier difficulty, NYU has determined that MARC records including a single URL from the publisher and lacking the NYU platform URL are acceptable. The rationale here is that the platform is more likely to be a destination for those searching for e-books than a publisher site and that a single URL, because it leads to content, meets the minimum needs of our users. Often the cost of ebrary involvement in these deals is higher than that cost when ebrary deals with the publisher.

Regardless of the business model, reconciliation of lists represents the backbone of this process: Title lists must match MARC records available on the NYU platform. In addition, we must have in place an ongoing process for verifying that the title lists from the publishers match the publication output and the books NYU expected to receive through our purchase. We've determined that the best reconciliation method for all frontlist purchases is twofold: First, to ensure on an ongoing basis that the title lists of books released from the publisher have matching, loaded MARC records and a version on the NYU platform, signaled by the receipt of a platform URL. Currently NYU is developing a database designed to track this type of reconciliation automatically and generate reports of discrepancies between the three sets of lists (e-books published, MARC records received, e-books at the NYU platform) for follow-up. The final step of reconciliation is regular (perhaps semi-annual, annual, or quarterly, depending on the track record of the particular set of books) reconciliation between lists delivered by publishers and books available from those publisher's sites.

The reconciliation process ensures that NYU is in receipt of the books we have paid for in the places we have paid for them to be available and that they are discoverable. It also helps ensure that publisher's predictive lists match appropriately with books published, not only in raw title count, but in types of books published and subject areas covered. In our experience, this type of reconciliation is an indispensable part of due diligence for both backlist and ongoing purchases.

Crucial to note is the pilot project status of these ongoing purchases. All of the parties involved have committed to this ongoing model for e-book frontlist package purchasing but our experience with the process is limited. Despite this fact, we have implemented one final flavor of e-book purchasing at NYU, in concert with our Manhattan Research Libraries consortium, including NYU, Columbia University, and researchers at the New York Public Library. This pilot project bears examination below because its reach will likely expand in the future.

Cooperation

Recognizing the lack of physical limitations on simultaneous use of e-books, NYU, Columbia, and the New York Public Library have begun to pursue a cooperative, consortial collection development path. The first mutual purchase took place in 2012 for e-books published in the University Press Scholarship Online (UPSO) collection available from Oxford University Press and partner presses, including The American University in Cairo Press, University of California Press, Edinburgh University Press, University Press of Florida, Fordham University Press, Hong Kong University Press, the University Press of Kentucky, and the Policy Press. The model for the pilot included e-access to all forthcoming 2012 UPSO titles for all consortial libraries as well as a single print preservation copy. In effect, four versions of the book are purchased initially (three electronic books and one print copy) with the possibility of each library purchasing additional print copies at a discount. Pricing for the initial four copies is discounted by using a multiplier applied to list price. As part of NYU's strategy, we pay a dual-hosting fee to have access to these titles on our ebrary channel as well as at the Oxford site, but currently only NYU is taking advantage of this possibility.

The NYU workflow process for the e-versions of these books parallels exactly the ongoing purchasing model outlined above,²⁰ with the exception that our print vendor, YBP, must incorporate the DDP pricing for print for all NYU print purchases of books obtained electronically through this arrangement. Currently, print purchases are made at full list price and credits are applied to NYU's account to represent the discounted print pricing. The workflow model will be tweaked to reconcile and verify this discounting process, but this is an aspect of the pilot that remains, for the time being, up in the air. Again, although this model was in effect for 2012 books, it is currently too early to comment on its success or even effectiveness. We feel confident, however, that the model is viable.

In addition to cooperation with our MaRLI partners, our e-book aggregator, publishers, and our print vendor and beyond concerns about the relationship between print and electronic book purchases and duplication within or across formats, NYU's environment calls for cooperation with a second Manhattan consortium. NYU participates in the Research Library Association of South Manhattan, which includes NYU, the New School, Cooper Union, Cardozo Law School, the New York Academy of Art, and the New York Historical Society.

In the past, our arrangements with those schools called for NYU to provide cataloging services to partner libraries and for our library, which is within walking distance of the majority of these institutions. Faculty, students, and staff at those institutions had borrowing privileges at NYU in the past. As our book collecting shifts toward electronic access, however, this function diminishes. Patrons from these partners can use the majority of our e-resources as walk-in users at NYU libraries, but they do not have institutional access to our e-books. In order to carry on the spirit of our prior arrangements, NYU and some consortial partners, the New School University in particular, have attempted to negotiate institutional access as an add-on fee to NYU licenses with publishers and aggregators.

Success in some of these negotiations has brought to the fore the need for strong lines of communication among this set of partners as well. Information about negotiations, licensing terms, title lists, and access restrictions as well as concerted efforts to make our intentions clear internally to legal departments and externally to publishers and vendor must flow unimpeded among partners in order to take full advantage of the potential of this sort of consortial work. Like much of the communication above, this is often difficult to sustain and can tend toward reactive solutions.

Looking Back, Looking Ahead

While we continue to fine tune our book collection strategy—trying to streamline and rationalize dual-platform access to desired titles as they appear; fine-tuning communication with vendors, publishers, consortial partners; developing extensible workflows for cataloging, purchase reconciliation, information sharing among departments; and thinking through usage analysis and metrics of success—we also are thinking through and working toward possibilities for making our e-books more integral and less idiosyncratic to our library work. Some goals would include: piloting potential licensing and technical arrangements that would allow interlibrary loan of NYU e-books; making more transparent the rights and restrictions associated with individual titles on each of the platforms on which they appear; linking between NYU-accessible versions of e-books to take advantage of the unique strengths of the platforms on which they are available; and, always, enabling the most frictionless discovery and use of books in our faculty and students' research, learning, and teaching processes.

Some of these goals will retire a quantum leap from the current state of e-book licensing and delivery while others will likely be ongoing processes, improving incrementally to keep up with changes and make up for shortcomings. Either way, we believe our current strategy has equipped us for journey ahead—as a learning process and as a reconnoitering mission. Perhaps the lay of the land as we have seen it will prove helpful as others set out on this same journey and, better yet, gain us some closer travelling companions as we continue down this path. ☺

ABOUT THE AUTHORS

Angela M. Carreño is the head of collection development for the Division of Libraries at New York University (NY). Angela has led, coordinated, and supported the expansive growth of licensed electronic resources at NYU since 2000. She is the primary licensing officer for the Division of Libraries and assumes primary responsibility for consortial collection development commitments. She represents the Libraries on collaborative projects with other campus units and other libraries. Since 2007 she has intensified work on the NYU electronic book collection in close collaboration with NYU's branch campus library in Abu Dhabi, a library with an e-preferred collection policy and in support of the Manhattan Research Library Initiative (MaRLI). Angela has experience serving on numerous Library Advisory Boards established by publishers and is the current Chair of the NERL (Northeast

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Bill Maltarich is the electronic resources librarian for the New York University Division of Libraries, where he has worked for the past seven years. He studied at Northwestern University and received a PhD in German Literature from the University of Wisconsin–Madison and an MSLIS from the Palmer School. He has worked with and focused on developing partnerships and strategies for integrating electronic books into collection development, processing workflows, library discovery tools, and patron research throughout his career.

NOTES

1. www.nyu.edu/global/the-global-network-university.html.
2. We also began to focus on multimedia delivery possibilities, but that's a story for another article.
3. *Against the Grain* provides a good overview of these myriad options, with the caveat that the options are in such a dynamic state that no overview can stay current for long. www.against-the-grain.com/TOCFiles/e-bookrollout.pdf.
4. One recent and helpful summary of these options and combinations is Mirela Roncevic, "E-book Business Models. A Complex Array of Factors," in *American Libraries Magazine*. June, 2013, www.americanlibrariesmagazine.org/article/e-book-business-models.
5. Usability concerns as explored by Merinda McLure and Amy Hoseth ("Patron-Driven E-book Use and Users' E-book Perceptions: A Snapshot," *Collection Building* 31:4 [2012], pp.136–147) or Lynn Silipigni Connaway and Heather L. Wicht ("What Happened to the E-book Revolution?: The Gradual Integration of E-books into Academic Libraries" *Journal of Electronic Publishing*, 10:3 [Fall 2007], <http://dx.doi.org/10.3998/3336451.0010.302>) and others (such as varying standards for both e-books and reading hardware; varying functionality and operability; and disparate, often constrictive, discovery and delivery mechanisms) are addressed by an institutionally aggregated collection on one platform.
6. Experience and research has born this assumption out. We ran a brief trial of Patron Driven Access collection development via ebrary in late February 2010 and purchased 675 titles in two weeks without having loaded MARC records. The literature also bears this prediction out. According to Alain R. Lamothe, "The size of an e-book collection was determined to show evidence of an extremely strong relationship with the level of usage e-books experienced" (<http://crl.acrl.org/content/74/1/39.full.pdf>).
7. We are however in the midst of a project to apply our license terms to collections of publisher books, specifically in regard to downloading as described above. Some publishers do not allow patrons to take advantage of ebrary's download functionality for books sold or leased by ebrary, but we are exploring the possibility that as dual-hosted customers we may indeed have that right.
8. It has proven difficult, however, to inform users about these varied rights and the varying locations of the most liberal DRM.
9. Even in a dark archive such as Portico, it is unclear that content purchased from aggregators rather than direct from publisher would be retrievable after a trigger event. Simply matching purchases on various aggregator platforms with publisher content in the archive would, under current conditions, be a monumental task.
10. "Additional formats" is intentionally vague. NYU has considered the possibility that not only print and electronic versions of books should be available as a full content payment plus DDP, but that other formats such as personal use POD copies for NYU authorized users would be covered under the DDP model.

11. In the sciences, our subject liaisons have seen clear to eliminate print in most instances, supplementing their e-collecting with slip notification about print availability regardless of the potential gaps delayed format availability might present.
12. Frequently, however, this is not an accurate portrayal of their position. There are, for many reasons, many e-book publications, packages, and offers, which bypass YBP and are not reflected in their systems. For now, we focus our attempts on accurately reflecting previous purchase of any content in the GOBI system rather than on GOBI reflecting ALL NYU e-book purchases. The goal is to enable conscious and conscientious selector decisions from within GOBI, so this policy currently suffices.
13. Annie Wu and Anne M Mitchell. "Mass Management of E-Book Catalog Records: Approaches, Challenges, and Solutions." *Library Resources & Technical Services* 54:3 (2010): 164-74; Kristin E. Martin and Kavita Mundle, "Cataloging E-Books and Vendor Records," *Library Resources & Technical Services* 54:4 (2010): 227-37; Rebecca L Mugridge and Jeff Edmunds, "Batchloading MARC Bibliographic Records: Current Practices and Future Challenges in Large Research Libraries," *Library Resources & Technical Services* 56:3 (2012): 155-70.
14. In fact, even though a user might stumble upon an e-book, often without the authentication information included in our systems (specifically the EZproxy prefix or site-specific URL), users will find the material inaccessible.
15. Lixia Zhao, Linda Wen, Donna K. Rose, and Maureen James, "E-book Metadata in ILS and Discovery Tools," Brick and Click Libraries Symposium Proceedings 99 (October 26, 2012) <http://files.eric.ed.gov/fulltext/ED537605.pdf#page=108>; Tony Horava, "Today and in Perpetuity: A Canadian Consortial Strategy for Owning and Hosting E-books," *Journal of Academic Librarianship* 39:5 (2013), <http://dx.doi.org/10.1016/j.acalib.2013.04.001>.
16. We set aside here one-off e-book purchases via YBP's GOBI system since these integrate into our current workflows once our technical specifications have been communicated to the vendor and a "check-in" workflow, consisting of record review and URL checking, has been implemented.
17. During the purchase negotiation phase of e-book acquisition, it pays to attend to these problems in the title list of books for sale: duplicate titles are not unheard of in these lists, and it is possible that a package of books for sale includes books that fall outside the typical scope of the library's collections or excludes books, often popular books, that the library would like to own.
18. Again, the details of this process, especially because of the added complexity due to our dual-platform requirements, could and should be an article of their own. We are eliding important details and processes for the sake of the greater overview this paper should provide. In addition, e-book cataloging processes at NYU are currently in transition in an attempt to make this cataloging more routinized and efficient.
19. Potentially, a PRINT patron-driven acquisition model might solve these problems. E-books meeting our approval plan criteria would be delivered upon their availability and MARC records for print books, both those duplicating our e-book purchases and those matching our criteria and not duplicated in E, would be loaded into the catalog and purchased upon request. The difficulty is that the time frame for this delivery can vary wildly depending on the print run purchased by our vendor and hence the problem of satisfactory availability of new publications would, currently, remain unsolved in this model.
20. Workflows at our partner libraries are independent of NYU's and hence left unexamined in this article.

One Approach, Many Pieces

How iPads, Laptops, Labs, and Libraries
Create Tech-Agile Students **by Linda D. Behen**

SCHOOL BOARDS, ADMINISTRATORS, teachers, and entire school communities spend a great amount of time (and money) making decisions about technology programs. The seemingly endless possibilities and choices are growing rather than becoming more standardized and typical. The early adopters of the 1:1 laptop program are already rethinking or redeveloping their approach to tech tools: some are embracing a BYOD (bring your own device) program; some are beginning a 1:1 program with laptops or mobile devices; and some are creating combinations by mixing the possibilities.

It is safe to say that the common element regarding technology among all schools is hope—hope that the experiences and benefits from technology tools and programs will make a positive and rewarding difference in students' lives. What school wouldn't wish that its students' tech agility and knowledge grows, develops, and prepares them for the next phase of their education?

No one can predict what technological changes will occur in ten, five, or even two years. But one thing is certain: today's students and educators are the luckiest learners and consumers in history. Educators are actively engaged as lifelong learners through social media and online learning. Through this easily accessible and available professional development, they are developing new methods to engage students through what may best be described as academic entertainment. The multimedia tools satisfy young learners' "minute to get it" approach to learning; movies, podcasts, interactive websites, blogs, and photos

bring information and facts to life. Academic entertainment in the form of videos, social media, and other multimedia forms doesn't create students with lower-level skills, knowledge, or abilities to learn; instead, it makes learning more enjoyable, engaging, and approachable. Students are likely to learn content more deeply and use it further and farther when there is a personal connection and enthusiasm for the material.

Whatever choices a school makes toward a technology program, they will be a moving target. What works one year might not work the next, and the current trends with mobile devices make keeping up difficult and costly. The best choice for any school is one that is appropriate for its circumstances and focuses on the unique needs of its students. But in order for the technology to be that magic ticket to knowledge, lifelong learning, and enrichment, assurances that the technology will be integrated into the curriculum (and beyond the curriculum) are needed. Luckily, school librarians, with experience as trail blazers, along with progressive and early adopter teachers, can light that fire that spreads enthusiasm and buy-in from other teachers and students. Finally, an insightful and confident administrator will assure that teachers are provided ample time and rewards for tinkering, discovering, and catching that enthusiasm.

This article offers a look at Mother of Mercy High School's commitment to diverse technology tools, programs, and approaches that are proving successful in developing confident and agile high school students. Mercy's methods are not necessarily original, but the combination of its tools and strategies likely are. At the time this article is published, it is to be assumed that we've already made some changes and adaptations to our program. Constant change is surely the single dominant process that defines any school's technology program. It is, in fact, the only certainty.

Mercy's Unique Technology Program

Mother of Mercy High School, an all-girls 9–12 school in Cincinnati, has created a unique and dynamic technology program that appears to be satisfying its students' and teachers' needs. Statements from students and graduates through evaluations, surveys, and informal feedback confirm this: students often define themselves as tech agile, and their enthusiasm spreads naturally to incoming classes and students. Graduates come back to visit and tell us that they are much better prepared and less hesitant with new technologies than peers in college and work. Mercy's students frequently provide technology help to teachers and peers, and every year new student tech leaders are fully prepared to replace the ones graduating.

In short, Mercy's approach differs from most in that it is inclusive, taking into consideration that there is no single device or method that can solve every information or technology need. Its tech program includes the following:

- both a Mac and a PC lab
- a 1:1 iPad program
- a BYOD program
- multiple classroom carts with sets of laptops
- art, journalism, and broadcasting classroom labs loaded with specific subject-related software and programs
- library loaner laptops, iPads, Kindles, and device accessories

As this varied list shows, Mercy has not overlooked many options currently available to schools. It has, in fact, made a deliberate choice to reflect the world outside the school walls and to eliminate as few options as possible in order to provide students with the best momentary choice for their information needs.

Policies and Rules

All educators know that learning is the goal and that technology is only a tool utilized to achieve the target. To make certain that Mercy students use technology wisely and to advance their learning, much consideration is given to how they can develop time management skills, responsible behavior, and social etiquette using technology, and a tinker-think approach to learning. Mercy eliminates as many barriers as possible so that students will have every opportunity to discover, learn, and create. The school has high expectations that students will self-govern their behavior and involvement with social media, the Internet, and devices, and that teachers will successfully manage their classrooms with the age-old methods of respect, authority, and engagement.

Despite few rules and much freedom to use technology tools as needed, Mercy is not a chaotic, rules-free environment. Our handbook is chock full of guidelines and policies, and there are plenty of policies for technology use. As technology becomes more integrated into the school, it seems obvious that exceptions and changes occur; it doesn't make sense to provide students with all the tools they need but then allow little availability to them. Below are some methods used to encourage students' tech agility and responsible use of technology:

- Students are permitted to make phone calls or text at school when not in class.
- Social media is embraced and encouraged through classes, clubs, and sports, and as a method of staying connected through school breaks.
- Electronic textbooks and supplemental interactive textbook information are encouraged and utilized by teachers and students.
- Classroom management software, websites, apps, and blogs are regularly used for communication among students, teachers, and administration.
- Web-based resources and bibliographic tools are encouraged in every classroom.

- Students' use of media programs and tools that satisfy and demonstrate knowledge through class projects and assignments is applauded.
- Student participation in clubs and activities that focus on technology use and learning is celebrated.
- Teachers are encouraged and rewarded with integrating new technologies into their classes.

Mercy's Principal, Dave Mueller, admits that there can be complexities with a multilayered technology program and that these obstacles need special attention and creative solutions. He warns of the following:

- BYOD can highlight differences in the family resources available to students.
- As long as apps are device specific, apps will be a two-edged sword in a 1:1 mobile device program. On the one side, the same app for each student makes for an efficient lesson. On the flip side, the longer a school invests in a particular mobile device and its apps, the harder it becomes to shift to a different 1:1 device.
- The more devices and platforms used, the greater the management challenges.

Mueller finds that the benefits far outweigh the complications, stating, "It's imperative for today's students to become tech-agile and to think critically about selecting tech tools for use. The variety of tech tools inspires and enables teachers to use a broad range of instructional methods."

Mueller also offers advice for schools refreshing or creating a new technology program, suggesting the following:

- In light of the rapid pace of innovation, be wary of going all-in with a particular device or platform.
- Develop a guaranteed and viable curriculum of tech skills mapped across core courses. Teach tech skills as much as possible by having students apply them in content courses rather than learning them in a dedicated tech skills course.
- Use annual stakeholder surveys—both national surveys such as Speak-Up and homemade surveys.
- Listen attentively to teachers and insist that they find out about best practices used by colleagues in other schools.
- Resist making decisions based on marketing alone.
- Develop and use an authoritative personal learning network regarding the use of technology in schools.

The iPad Program

The newest addition to Mercy's technology is the iPad 1:1 Program. The pilot program that began three years ago in order to investigate both challenges and benefits of the device resulted in a program for incoming freshmen in 2012. Two classes now have their own iPads and feedback from teachers along with surveys from parents and students are encouraging; parents with older students wish that every student could receive an iPad, and students state that they are more organized and better managers of their time through iPad apps. There have been some minor complaints, however, including parents worrying about too much time spent online and easy distraction from other areas of students' lives.

Freshman teachers involved in the pilot program for iPads received their own iPads long before the program began in order to provide time to discover how to best integrate them into their professional and personal lives. Workshops and instructional sessions were offered and expected from the pilot teachers, and training has continued for larger groups of teachers. Teachers from the pilot and first-year programs currently help to moderate the workshops and to share the experiences of using the iPads in classes. However, the sessions are not limited to the pilot or freshmen teachers, and many teachers and staff from upper levels and all areas of the school attend as well. Some topics addressed include:

- classroom management tips
- printing, projecting, and using the personal time management tools
- subject-specific apps
- acquiring apps
- sharing information through iPads
- lessons learned

There is a variety of use among teachers and class departments; those who are early adopters of technology and eager to integrate new tools and methods whenever possible are likely to use the iPad more often. Further, some subject areas are naturally better suited for constant use of the iPad and the academic entertainment it provides. Other teachers use the iPad less and rely more on labs, laptops, and smart phones. Although iPad skills and methods are encouraged for teachers to develop (and most do take full advantage), there is no policy demanding that every teacher use the iPad.

It has been Mercy's experience that although iPad carts for classes to borrow can achieve many benefits of interaction with apps and multimedia, the personal features and time management tools that aid students in becoming tech agile and proficient in navigating today's technological world are invaluable and necessary for each student's education. Students learn how to use and rely on electronic calendars for both personal and school needs. They navigate through file storage and presentation programs in the Cloud. They become experts backing up and syncing devices. They no longer fear incompatibility issues between home school devices. They simply learn to trust the myriad ways to fulfill any need and they become very creative in finding solutions.

Mercy uses [Maas360](#), a mobile device management program to manage student iPads and their apps. Maas360 allows the school to push out required apps to students, to locate a missing iPad (and to disable it), and to know what students are independently downloading. The list of favorite apps used by students and teachers is dynamic. Organizational and note-taking apps that Mercy pushed to students the first year of the program were replaced, on the advice of students, with others for the second year. However, the most commonly used apps continue to be Animoto, Prezi, Studiez, Flashcards ++, BlackBoard, and Powerschool.

From the classroom management point of view, a shared cart can be a time stealer; the class time that it takes to configure and reconfigure a borrowed device from a cart for a new user can be an ongoing bother, and keeping devices updated and clean takes time.

There is a common understanding among our school community that this device is our choice of the moment but that as technology and devices evolve, there might be a different device that we choose in the future.

Freshman Preparation

Before school begins in August, freshmen are offered iPad orientation dates and times to come to school to pick up their iPad, accessories, and to attend a two-and-a-half hour workshop. Parents are offered insurance to cover breakage or loss, and they can choose whether to purchase the insurance or not.

Each workshop has about twenty-five students and they arrive with signed contracts, technology/iPad use policies, and optional insurance. If a student arrives without one or more of the forms, they are invited to remain as part of the workshop but advised that they will need to leave their iPad at school until they can return with their completed forms.

Although most students have seen or used an iPad at this point, some have not, and most have never owned their own iPad. The workshops begin with setting up the iPad, which includes finding the serial number, creating or using an existing Apple ID, setting up e-mail (a school-issued Gmail account), and tinkering with other settings and iPad features. In addition, students download the common apps required to have on their iPads and are provided information about expected behavior, etiquette, and responsibilities. Students are given time to play and experiment with their new devices during the workshop, which gives them a chance to make certain that their device is working and ready to go. The school benefits by not needing to set up each iPad prior to the dispersal, and any hardware issues are quickly be discovered before the end of the session.

The required, school-issued apps are purchased through Apple's [Volume Purchase Program](#), which allows educational institutions to purchase iOS apps and books in volume and distribute them through the school's network. Some of the first apps that students download and that we walk them through in orientation include IStudiez Pr, Flashcards ++, and Notability.

We've discovered that many students locate and use apps that they feel do a better job than the school-issued ones and are encouraged to use the apps they prefer. Their ability to download those apps is not restricted, but the apps used should not be contrary to the school's mission. Students are also frequently surveyed in order for the school to stay informed of their needs and interests. Throughout the school year, teachers also frequently find additional apps they want to use in their classes, which might be subjects for the volume purchasing and dispersal or designated as apps for students to individually purchase or download for free. Factors involved in that decision include cost of apps, number of students who need the app, and the variety of similar apps.

iPad accessories that students receive at the orientation include a protective case, charger, and ear buds. The cases have an ID pocket with their name displayed. One of the first questions students usually ask is, "Can I replace this case with one of my own?" The answer is "yes," but with a warning that the orthopedic-looking case has proven to protect iPads better than less protective, if fancier, cases. A few early warnings students receive include:

- Every iPad looks the same without the case and your name displayed—be careful about removing the case so that you don't lose your iPad.
- Don't stuff your iPad (even with the protective case) in your backpack against rigid items like textbooks.
- Without insurance, you will be required to replace a broken iPad.

Mercy has experienced very few broken or lost iPads since the program began and most were quickly repaired or replaced through insurance. However, when an iPad is in the process of being repaired or replaced and not in a student's possession, there is a need for a temporary device so that the student can continue as seamlessly as possible with classroom assignments. Library loaners that are cataloged and barcoded are a simple method of providing a device to those students in need.

The Library's Role

Today's tech world is still in a transitional phase when it comes to delivery methods and formats with which to access content. Our library's goal is to provide each individual patron with the best resources for a specific informational need; print books, e-books, databases, and websites are among the choices from which to choose. Individual preferences change as an assignment or informational need changes, and the library's goal is to satisfy that momentary need, and more importantly, to develop students into curious, savvy information literate users who confidently approach, and perhaps even embrace, the hunt for useful and reliable information.

The future from Mercy Library's very small crystal ball predicts a growing social and participatory world where multitype libraries work together to satisfy

information needs of their patrons. Even today our students are benefiting from the collections, programs, creativity, group think, experience, and budgets that are available to us through sharing and playing with other librarians in our community and beyond. Every opportunity or experience that results from attending a conference, workshop, webinar, or meeting, or joining and participating in a consortium or committee grows our patron's resource base. And that resource base grows the likelihood of better satisfying individual needs and developing lifelong learners. Through technology and today's social media, the opportunities to connect with other libraries and librarians are endless. It's never been easier to keep up with both the education and library professions.

Some of the following choices reflect Mercy Library's inclusive approach to technology and information:

- INFOhio, a statewide cooperative school library and information network, hosts Mercy's library management system and additional information resources.
- Mercy's Library continues to grow and circulate a print nonfiction and fiction collection.
- Weeded nonfiction, and especially reference, when feasible, are replaced with e-books and databases.
- On-demand purchasing guides the Library's collection development.
- Kindle book readers are loaned to students and teachers despite the iPad 1:1 and BYOD programs.
- Wireless keyboards for mobile devices are loaned for in-school use.
- A supply of audio ear buds and headphones are available for students to borrow.
- The Library provides access to and primarily relies on the electronic databases from INFOhio's information network and the Public Library of Cincinnati and Hamilton County (PLCH) to satisfy our database needs.
- Digital pathfinders provide Mercy students with library information and resource-focused research and informational guides.
- Apps, fiction, and information resources are constantly recommended via electronic marketing tools, social media, one-on-one interactions, as well as through classes.
- The Library has a social media presence that connects patrons and information.
- The Librarian participates in the incoming Freshman iPad orientation workshops.
- Library staff moderate or comoderate student technology clubs and services.
- Library staff attend face-to-face meetings, workshops, and conferences while regularly participating in webinars and digital forms of professional development.

- The Librarian participates in the school's decision-making process through Academic Council, technology committees, and personal learning circles.

INFOhio

INFOhio's Library Automation membership includes over 2,400 Ohio schools in 480 districts. In addition to library automation management services, Infohio provides Ohio school libraries a broad (and free) group of educational and professional resources, including:

- A core collection of databases and informational K–12 resources
- instructional development tools that include webinars, workshops, and ongoing support
- media resources
- a curriculum resource catalog for help in collection development based on Ohio's Academic Content Standards
- social media discussion concerning school libraries and education

The migration to this robust and large system occurred in 2012 as a result of a server crash and the immediate need to rebuild the Library's databases. The benefits and disadvantages of keeping our program in-house or of becoming part of a large system were weighed carefully, and it was determined that the library and school did not want to miss out on the many advantages of what a large group effort can provide. In addition, the networking among other school libraries within the Infohio network has proven invaluable.

ADVANTAGES

The advantages of the INFOhio network include

- off site hosting with no in-house maintenance required to keep records and system up-to-date and safe
- experts who administer the system and act as advisors to each individual library
- interface and system components that are well researched, developed, and redeveloped for ease of use
- support and help that are seamless, immediate, and tailored to each library's needs
- individual libraries can share catalogs and collections or choose to maintain anonymity
- best library practices are incorporated in the design, technical services, and support

- system-wide librarians who are part of a network and rely on each other for tips, tricks, and informal support

DISADVANTAGES

The disadvantages of the INFOhio network include

- a loss of control—individual libraries need to trust that their systems are secure and safe
- changing settings or methods might need to be addressed at an administrative level or with the advisory board
- as with any new system, learning a new interface and methods takes time and effort

Continued Growth

The e-book industry remains in a state of flux, with pricing and license agreements often confusing and in opposition to a library's needs and wants. And patrons continue to request print when given an option of digital access or a hard copy. Mercy's library continues to purchase both fiction and nonfiction print titles from a number of different vendors and sources. Patron demand, license agreements, and pricing drive most of our acquisition decisions.

Print magazines are purchased for entertainment purposes. Titles in the spirit of *Seventeen*, *Teen Vogue*, *Mental Floss*, *The Week*, and *Entertainment Weekly*, for example, are located in multiple locations around the library in order to tempt teen patrons. In addition, a variety of local and national newspapers are available for browsing with links to electronic versions on the library's webpages.

Nonfiction print monographs are likely chosen from the popular and contemporary titles in demand for a specific assignment or class. Some, especially the more expensive ones, are first borrowed and auditioned through local academic and public libraries to determine the lasting need. When patrons seem satisfied with the titles, they are then purchased in print or digital formats (or both) to satisfy ongoing use.

Fiction titles are frequently purchased in both digital and print formats, depending on demand, and through a variety of sources and vendors. Print fiction titles, even when the copy is yellowed and ugly, remain the first choice of students, and copies of classics are weeded and replaced regularly to meet the need. When no copies are available for immediate loan, most Mercy patrons happily accept the e-book with a "better than nothing" attitude. However, more and more frequently, those patrons return to specifically request another e-book. In addition, whenever possible, free titles from either a public domain site or the patron's public library are downloaded (or demonstrated to patrons on where and how to download) in order manage the budget wisely.

Access to both print and digital titles occurs in a variety of ways with the hope that users will locate what they need despite their searching or browsing preferences. For example:

- access to both print and digital book titles is available through the library catalog
- titles grouped by subjects are recommended and added to research and information pathfinders and guides
- links to free, public-domain titles and sites are posted on Mercy Library's website and pathfinders pages
- both print and digital books are marketed with signs, print books, or book cover images
- reserve books are visibly displayed and available for browsing
- the "Book of the Week" is displayed at eye level in both an electronic and physical print format
- displays and collections of books that tease, "If You Love This Book (actual title), You'll Love These" are conveniently located near gathering spaces and comfy seating
- one-on-one conversations and recommendations through research and information literacy instruction remain important methods for satisfying students' research needs

Weeding Print

Unless there is a specific request for print, or the demand warrants more than a single copy, Mercy's reference and nonfiction series are weeded and replaced with digital content. The online database search feature that facilitates the quick location of subjects and information can't be matched in print materials, and most students prefer efficiency. However, the decision remains flexible. There are exceptions made for popular and contemporary titles requested for specific classes or by individual patrons.

On-Demand Purchasing

Everyone knows you can lead patrons to books, but you can't make them read them. The amount of money spent on titles that have circulated once or that have never circulated is frustrating and impossible to undo. Shrinking budgets with growing amounts of information, formats, and delivery methods promise that libraries will never be able to satisfy every anticipated need. This is why on-demand purchasing is an important method of solving these common collection development issues:

- immediate need and demand determine that items purchased and added will be used
- staff time spent on purchasing and processing are efficient and worthwhile
- students and teachers whose requests are satisfied quickly and efficiently become happy and loyal patrons
- money is saved and available for additional purchases

Although similar in philosophy to the academic library's patron-driven acquisition (PDA) model, Mercy's on-demand method differs in the process of patron-initiated purchasing. The library staff manage and control the entire technical aspects of the acquisition process. Compared to a college or university, Mercy's student body is small, and every opportunity to have either face-to-face or electronic conversations with students about resource needs (or any topic) is encouraged. Information and book requests are a great method of getting those conversations going. Quickly satisfying an individual student or teacher's request is a guaranteed method of developing loyal and regular library users.

Loaning Kindles

Tech agility comes from use and knowledge of a variety of methods, devices, and tools. Mercy's students have access to any type of device they desire through our technology program; what the school doesn't provide, the BYOD program allows. While most students' personal devices are smart phones, iPads, laptops, or home computers, three basic Kindle readers—and one soon to arrive, Kindle Fire—satisfy needs that are less likely to be satisfied elsewhere. Digital books are easily downloaded to any of their own devices at the individual student's expense.

However, the benefits of providing library loaned Kindle readers is that the patron becomes skilled in using yet another device, and the user's need (without expense to them) is immediately satisfied when a requested digital title is purchased and downloaded. In a single year, more than fifty e-books were purchased and downloaded as a result of patron requests. Most of these titles were downloaded immediately for students, and they walked away within minutes of their request with the Kindle tucked under their arms or in their backpacks.

Additional bonuses exist for both patrons and the library; students have access to other previously downloaded titles on the device, the library normally saves some money with the digital title and we can share the title among our Kindle devices.

Database Access

Mercy Library's method of database access is both practical and efficient. Instead of duplicating effort, money, and resources by purchasing titles already available

to students through INFOhio's Core Collection and students' public libraries, we connect them to those resources. However, we do purchase what is not already available and what we've discovered important for our students and teachers.

Digital Pathfinders

Formerly, much time and effort went into creating research pathfinders on a blog or website. LibGuides, for example, have made the creation, editing, copying, and branding of libraries' content management pages easy and practically effortless. Mercy's forty-plus guides supply students and teachers with the best resources and strategies for a specific assignment or project, and are easily, in part or whole, incorporated into other guides and pathfinders. Mercy Library has switched to a LibGuide as the library's landing page. Students find the format easy to navigate and request guides for projects if not already available. The library catalog is no longer the only method of locating materials and the options to embed and add visual eye catching videos, links, and images to resources and information make this resource one of the most used search tools in the library.

Activism and Methods

The remaining items listed under Mercy Library's inclusive approach to technology and information focus are the librarian's activism and redesigned methods to assure that each student's tech agility and information literacy are ensured for their success beyond high school. Multiple methods of communication are necessary: face-to-face meetings, instructional sessions, and electronic and social media all have impact and an important place in schools. Talking about social media and technology tools is not enough, however. Using tools is one sure way to point to their relevancy and practicality. For example, blasting tweets to students and teachers gives them immediate information about new library programs, apps, books or resources while demonstrating how Twitter can be useful in an academic setting.

Mercy's Tech Doctors' club is a small, in-school and during the school-day service group moderated by the librarian that helps teachers and staff with tech issues. The Tech Doctors fix and update computers and devices and are on-call during their study halls or free time. Students are recognized and thanked at the end of the school year, but the benefits for the earnest, young tech experts goes beyond the daily projects, needs, and awards. Each Tech Doctor advances her level of confidence, status among peers, and knowledge regarding technology.

It is vital to a school library's success that the school librarian participates in academic councils, technology committees, and personal learning circles in order to have a voice in school decision-making and to get to know and become involved with teachers and the curriculum. Professional development in and out of school quickly trickles down to the students' level; best practices among

school and academic librarians, new tech devices and methods of access to e-content, and networking results in expansion of resources and knowledge.

One of Mercy's professional goals in the coming school year is for teachers and departments to become experts in at least one area of media and technology of their choice. Whether English becomes proficient using Prezi or World Languages become proficient in iMovie or Screencast-O-matic, those skills will spread throughout the school via students. Those who successfully present or utilize specific tools and media will want to use those tools again and the technology will eventually pop up in every class.

Tech agility is the goal of Mercy's inclusive technology program, but curiosity and tinker-think approach to learning and life enrichment are the ultimate objectives that will make students successful in the next stage of their education as well as their life. ☺

ABOUT THE AUTHOR

Linda D. Behen is a school librarian at Mother of Mercy High School in Cincinnati, OH. She received her MLS from the University of Kentucky in 1994 and has spent most of her career as a school librarian, along with two years in a university medical library. She is the author of *Recharge Your Library Programs with Pop Culture and Technology: Connect with Today's Teens* (2013) and *Using Pop Culture to Teach Information Literacy: Methods to Engage a New Generation* (2006).

RESOURCES

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features

Forecasting E-content Costs and Growth Curves

Joseph Sanchez (Mesa County Libraries)

> Without first sale protection, the business model for e-content is typified by chaos and unpredictability. Publishers and vendors are free to charge libraries and any other organization without reference to their previous amicable relationships. Public libraries face an uncertain future as they anticipate future “trigger events” when much of the content libraries purchase in physical format shifts to e-formats exclusively. Such a transition would be catastrophic for libraries, argues Joseph Sanchez of Mesa County Libraries, as libraries’ budgets are designed for a first sale legal environment.

Taking his library as an example, Sanchez notes that public librarians can project what a simple migration to electronic formats would do over a ten-year period and what that would do to its existing budget and collection. If only 15 percent of the library’s current offering shifts to exclusively electronic formats, maintains Sanchez, its collection would be devastated at current market prices, adding, “even a cursory survey of recent history provides evidence that publishers are highly motivated to tighten restrictions for libraries and raise costs.” In this article, Sanchez examines current events surrounding the e-content ecosystem and sheds light on what librarians can expect to see moving forward.

Stepping through the Exhibit Glass: Bringing Museum and Archive Content to Life in Databases

Jim Draper (Cengage Learning) and **Stephen Wasserstein** (Cengage Learning)

> When librarians decide to purchase an online resource they think about the user base for the product, how it will fit into their workflows, how the product will influence research outcomes, etc. How that research product came into

being often does not factor into the decision. Yet when online resources render rare and archival materials, the product development process is all important, for the source institution, the publisher, and the end user. This article will explore the life and development of an online database—from content sourcing, selection, curation, preservation, and digitization to software and technology development and user testing.

Cengage Learning's Jim Draper and Stephen Wasserstein will take readers through a series of case studies based on the vendor's partnerships with museums and archives like the Smithsonian Institution, which houses more than 137 million artifacts and millions of documents, and the National Geographic Society, one of the world's largest nonprofit scientific and educational organizations. The article will show how objects and documents make the journey from behind exhibit cases and into usable tools that fit into researchers' work flows and help aid in new research discoveries, with a special focus placed on the challenges and opportunities. The article will be centered on the following: How do publishers and content partners decide what to digitize? How does one begin to incorporate three-dimensional objects into a database in a way that ties to the needs of researchers? What kinds of tools are needed for researchers to interact with content in the most productive way?

products

E-Book Reading Devices: An Overview for Librarians

John Burns (Dixie State University)

> The gadget-loving academic librarian is back to explore e-book reading devices. Burns's article, *E-Book Formats: An Overview for Librarians*, which was featured in the Fall 2013 issue of *eContent Quarterly*, provided an in-depth overview of the advantages and disadvantages of the most dominant e-book formats, including, among others, Adobe PDF, ePub, Kindle Books, and iBooks. Sticking to the same format (with bulleted pros and cons lists incorporated throughout) and to the same mission (to evaluate the devices both in terms of their consumer appeal and from a perspective of a librarian purchasing e-books), Burns comes full circle, zooming in on the "hardware" used to access the bounty of e-content in cyberland.

The devices examined fall into three main categories: smartphones, tablets, and dedicated e-readers. While some see desktops or laptops/netbooks as the important fourth category, Burns' focus is on the devices that allow for a highly mobile e-reading experience. These include, among others, smartphones like the Apple iPhone, Nokia, Samsung, and LG; tablets like the iPad (including the Mini), Samsung's Galaxy TAb, and Google's Nexus; and e-readers like Amazon's Kindle and Barnes & Noble's Nook.

Rosen Publishing's STEM Initiatives

eContent Quarterly editors and reviewers

> Rosen Publishing is no stranger to developing cutting-edge electronic resources for the K–12 market. Since the dawn of the digital era, the publisher has been setting rather than following e-content library trends, having cemented its reputation as a preeminent producer of interactive e-books as well as online resources for elementary, middle, and high school markets. These include such products as Teen Health and Wellness, Digital Literary, and Financial Literacy, to name a few. But Rosen's recent focus on STEM and science subjects seems especially worthy of our attention. At a time when the country's schools are in dire need of resources promoting science education, Rosen's recently launched Core Concepts Period Table (CCPT)—designed to help students develop a deep understanding of the 118 elements that make up the world—should be considered by every librarian looking to support his or her school's mission to encourage student interest in science.

Core Concepts Period Table is the first of four in a group of new science products geared toward high school and middle school students, with others to follow in the coming months and to include Core Concepts Biology, Core Concepts Chemistry, and Core Concepts Physics. This article will take a closer look at CCPT and its noteworthy features, including embedded interactive activities for students, lesson plans, data tables, diagrams, and videos from the renowned Chemical Heritage Foundation. The article will also describe Rosen Publishing's growing portfolio—which includes the PowerKnowledge Science Suite—and the company's strategic transformation into a “media” company, with perspectives offered by the insiders shaping the content and bringing it to libraries. ©