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From the Editors

WELCOME TO THE THIRD, Spring 2014 issue of eContent Quarterly. Since launching the journal at 2013 ALA in Chicago, we’ve covered an array of topics from every corner of the industry, including sweeping overviews of the vastness of the e-content landscape; case studies pointing to how e-content continues to revolutionize research in academic and school settings; and various product reviews, with insight from those who create them and feedback from those who use and purchase them. To our own surprise, we’ve also been able to structure each issue around a central theme. Issue 1, thus, focused on the importance of partnerships and Issue 2 placed the user experience at the center of e-content design.

Issue 3 resists the common theme approach, as it features four distinct articles on four distinct topics. Still, upon closer examination, we can detect a subtle message hovering in the background—a simple but persistent awareness that the future of reading, all reading, really is online. Whether forecasting e-book scenarios in public libraries years from now, or shedding light on a vendor’s efforts to bring archive and museum content to life, or keeping up with reading devices and learning resources—which are evolving, it seems, at the speed of light—all contributors in this issue anticipate a future in which reading continues to march in the direction of “all digital.” This includes e-books rather than print books permeating public libraries, budget vows and all; vendors putting out products that make cultural artifacts practically come to life on computer screens; an array of even more sophisticated reading devices that make us rethink our relentless “connection to print” sentiments; and new learning resources that engage students the way we couldn’t conceive of a few years ago.
Joseph Sanchez, a nationally recognized leader on e-books and e-content, opens his discussion by identifying what he calls “the pressing question” facing public libraries today: How much physical content will be exclusively available electronically, when will it happen, and how will it affect public library budgets? To answer the question, Sanchez shares the experience of Mesa County Public Libraries, where he serves as director, to forecast a number of “conservative” assumptions about eventual migration to digital. Regardless of outcomes, Sanchez concludes, “we should be planning now for the worst scenarios, and be ready to execute those plans when we see which scenario will eventually play out.” On the academic end, Jim Draper and Stephen Wasserstein, both affiliated with Gale (part of Cengage Learning), in the context of discussing the vendor’s recent products, argue convincingly that today’s e-resources provide a more valuable and instructive experience to an online researcher than any single museum to a “physical” visitor.

The remaining two pieces are product-oriented. Librarian John Burns is back with an overview of e-reading devices (he walked us through the world of e-reading formats in Issue 1), while school librarians Catherine Leininger and Diane Dillon take Rosen Publishing’s new K–12 resource, Core Concepts: Periodic Table (CCPT), for a test drive and offer thoughts on its usefulness in educational settings. Can learning about chemistry—and science in general, which has been Rosen’s focus lately—really be fun? Leininger and Dillon give kudos to Rosen for going further than others to show that it can when resources are as interactive as CCPT.

Issue 3 clearly places less emphasis on the trends and more on the products themselves, so it seems appropriate to end by inviting readers to consider all that the products have to offer today, to remember what they looked like in the not-so-distant past, and to then imagine what they will be able to do in the near future.
Forecasting Public Library E-content Costs

by Joseph Sanchez

PROJECT GUTENBERG BEGAN creating e-books in 1971, but e-books did not gain any real traction until 2007, when Amazon launched the Kindle. Even in the late 1990s, when e-books were at least on the edge of librarians’, academics’, and publishers’ awareness, it seemed that e-books never would be embraced by the general public. Ultimately, they were, and the questions facing us now are not how viable e-books are, but how much of the book market will be dominated by e-books and whether e-books will replace print books.

This should not have been a surprise, as the music market saw widespread disruption in the 1990s when early e-readers like the Rocket eBook were floundering. Clearly, consumers were interested in the obvious benefits of e-content, and while Sony launched their e-reader first, it was Amazon, the inventor (practically speaking) and leader of online retail, who realized that ease of use and delivery of content would make or break the e-book market. Again, this simple design solution should have been obvious as early peer-to-peer services like Napster and WinMX had proved consumer interest in e-content if a simple enough interface was available. Librarians and information scientists should not have been surprised, as the behavior patterns and adoption of e-content fits nicely within well-established information science and information-seeking behavior. Instead it was Amazon and Apple that met the needs of patrons with a viable electronic ecosystem for their music, video, and even books.
Public librarians were surprised and totally unprepared for the explosive growth of the e-book market in spite of the clear evidence from the music and movie industries. This growth and adoption of e-content was predictable, as information professionals had been subscribing to digital services like EBSCO and Gale for years. Unfortunately, the profession seems to have assumed that those types of e-content would never replace physical content, and would remain a supplemental service to our core service as physical content warehouses. Evidence suggests that librarians finally are starting to realize the bigger picture issues involving the first sale doctrine and its lack of application to digital formats, as well as the possibility that digital formats may replace physical ones. The involvement of librarians in new organizations like the Owners’ Rights Initiative and several high-profile lawsuits involving (mainly) academic libraries have begun to capture the attention of librarians everywhere. While Art Brodsky’s celebrated (and problematic) article in *Wired* does not mention first sale specifically, it discusses the core problems surrounding a lack of first sale for e-content.

### The Historical Context

The pressing question facing the profession is how much physical content will be exclusively available electronically, and when will that happen? For public librarians, especially, a third question is how it will affect their budgets. This article will answer those questions using an experiment by Mesa County Public Libraries, Colorado, to forecast a number of conservative assumptions about an eventual migration to e-content, and apply it to the best assumptions we can make about current e-content costs. We chose to use e-books primarily because print books represent the core of our purchases and physical spaces. While acknowledging that databases can and most probably will continue to absorb more of our budget, we focused on books exclusively, because a transition to digital books would represent the most chaotic transition for us as institutions given that so much of our physical space, human resources, and public perceptions still revolve around print materials. However, in order to understand the forecast, a broad examination of the e-content market and ecosystem is needed.

It is imperative to recognize that the e-content market is in its early stages of development. Any examination of it must be understood in this context. For example, the much-celebrated Pew study published in early 2012—which found library e-book borrowers also buy e-books—lacked any real examination of the motivation for purchasing e-books. If the observation about ease of use and interface design is correct, it may be that e-book borrowers are bypassing the demonstrably clunky and click-intensive interface of systems like OverDrive and EBSCO and buying the e-book version out of frustration rather than putting up with subpar, buggy interfaces. ALA President Molly Raphael’s comment that “e-book borrowers being buyers is a phenomenon that’s true in the print world as well” is a non-sequitur. It is a correlation that does not have demonstrated causal links. Rather, she and the rest of the profession are carrying an assumption over
from the old physical market into the digital one. Given how spectacularly the profession failed to predict and understand the e-content impetus and its explosive potential, her assertion is suspect at best. The Pew study is best understood and utilized as one snapshot in the chaotic and explosive evolution of a market, rather than a foundational and authoritative examination of said market. Doing otherwise is akin to using an australopithecine as a stand-in for *Homo sapiens*. In other words, don’t assume the score at halftime will reflect the final score.

Music is the most mature e-content market and the best one for extrapolating and forecasting potential trends for the rest of the market. This is because we can confidently assume that the last physical format for music, CDs, is in its twilight stage—soon to be replaced entirely by digital formats and niche markets like LPs. While this is common knowledge, it is less remarked upon that digital sales have yet to fill the void left by the decline in CD sales and revenue. Music’s “lost decade” is a reference to the period of time between 1996 and 2006 when revenues for the music industry went over a cliff. In February 2011, Michael Degusta argued in *Business Insider* that music revenues were down 64 percent from their peak in 1999. While various estimates differ on the actual amount of lost revenue, the implications were clear: the music industry had been savaged by digitization. Like all statistics, these numbers may be somewhat misleading. For example, the peak period of time referred to may have actually been a bubble in revenue due to the low production costs of CDs, which were sold at a high profit. Regardless, for the industry and the people who relied on it for their livelihood, the impact was real, significant, and is still felt today.

While the sale of singles had a growth curve, it was nowhere near enough to overcome an aggregate loss. Starting in the late 1990s, the music industry experienced a downward sales curve that continued until 2012 when music finally posted an increase in revenue thanks to a growth curve in digital sales. The growth came in at an anemic 0.3 percent, but it was the first increase for the industry in thirteen years. For reasons already mentioned, this growth must be interpreted cautiously, but a few broader conclusions can be extrapolated from it. From the perspective of librarians who have made the shift from e-content skeptics to nervous anxiety about what trigger event will push content into exclusively digital formats, it should be clear that publishers and Hollywood are afraid of the profit loss the music industry experienced. This seems like a reasonable inference given the catastrophic loss of revenue their music-industry counterparts suffered.

For publishers, it is a careful balancing act of weighing various risks against expected benefits. For example, publishers can reasonably expect to see an increase in total revenue from digitally exclusive print runs even if total sales decline, as almost all of the original investment risks do not apply to e-content. Gone are the analyses, reports, and salaries dedicated to developing a reasonable “print run.” Gone are the production and distribution costs. Instead, publishers are looking at marketing and visibility as brick and mortar bookstores continue to lose visibility and market share. As Mike Shatzkin has correctly noted, marketing e-books is the critical question publishers are attempting to solve in their
attempts to avoid the down curve in revenues the music industry experienced. Regardless, it seems clear that publishers and other content providers/producers are attempting to learn from the music industry and solve some of these questions prior to committing to e-content markets. They know from experience that once digital content is released into the marketplace they lose a certain amount of control of that content regardless of the protective measures taken. Digital content is inherently uncontrollable because copyright law evolved in markets where the reproduction side of the equation involved work and cost. Not so with digital material.

Currently, the first sale doctrine does not apply to e-content either, which is a much-envied position for copyright holders. Librarians have naively believed for years that publishers were more or less willing partners rather than recognizing the first-sale doctrine as the foundation of our practice and services. Publishers always have been skeptical of the evidence that print borrowers are also buyers. Without the first-sale doctrine, they are relatively free to shift the balance of power in their direction. Most consumers and librarians are blissfully unaware that they do not “own” any of the digital materials they purchase. The issue is further complicated as vendors like Amazon tend to use the same language on their websites as they do for physical materials. The infamous little orange button says “buy” rather than “license.” Attractive buttons and icons require less time and energy than cumbersome End User License Agreements (EULA). Yet, every user of legal e-content has agreed to them, most without knowing what they are. EULAs are those cumbersome, small-font, wordy boxes that pop up every time a user installs or sets up a new device/app/vendor. It is the “Agree” button no one knows, reads, or understands in spite of the clear request to read in the first line below.

Most EULAs contain two main components:

1. A liability clause
2. A license clause

There is a lot of other legalese, but for consumers those are the two most critical components and the most attractive to copyright holders. Because even though all the other language and experiences suggest or imply that the e-content “purchased” is owned by the user, in reality the EULA waives first sale and agrees to a much more restrictive license. Currently, this is how the vast majority of e-content is regulated and distributed.

It is critical to note that none of this developed in a vacuum. Copyright law has long tails, and efforts to reconcile it with the digital world have been ongoing. It became a public issue in the late 1990s, and the Digital Millennium Copyright Act (DMCA) was the first major attempt to address the issue. What is notable is that the DMCA was written in the social, economic, and legal context of peer-to-peer file sharing. File sharing was at the forefront of everyone’s thinking, and the DMCA and subsequent thinking focused on protecting the copyright holder’s rights rather than other questions that could have taken precedent. It
is possible that without piracy as the driving force, a broader perspective might have been taken. This seems reasonable given the 2001 Executive Summary by the United States Copyright Office on the concept of “Digital First Sale.” The summary explicitly acknowledges that technology has the capacity to potentially rectify one of the problems with e-content. That is, it can be “reproduced flawlessly” with little effort, placing it far outside the original boundaries envisioned by first sale. The legal doctrine is complicated, but it is easy to understand the situation previously described where publishers do not consider print runs with digital versions, because they are replicated on demand. First sale was developed for a far different market where production costs create real scarcity and physical items can only reside with a finite number of owners. The only way to expand the number of owners would be to replicate (at significant expense) the original item, which is subject to all the rules and regulations of the market.

The 2001 report, while dense, clearly communicates that the concern is not with technology’s ability to deal with this replication problem, as even the report acknowledges the possibility of a “forward and delete” technology that could ensure the original file leaves the owner’s possession and is transferred to another owner. Rather, the overall concern is the ability of the digital economy to ensure scarcity and control distribution—specifically illegal distribution. ReDigi, the intrepid start-up that attempted to create just such a forward and delete mechanism, recently discovered nothing has changed since 2001 as it lost the initial suit. It is this scenario and these fears that drive the library e-content market, and that will continue to drive it.

Can libraries reasonably forecast and plan for the future given the current uncertainties? Yes and no. Yes, because they can extrapolate from the music industry and expect content producers like Hollywood and publishers to fight for a legal environment that favors their interests. The epic eighteenth-century battles in England over copyright law are quite instructive in that we see the same two arguments over copyright restrictions being made today by the same parties. Copyright holders argue that loosening copyright will result in less production because it will remove motivations for artists to produce, while the other side argues against the dangers of monopoly and advances a broad ethical concept of “the public good.” So libraries can draw a clear line from Overdrive’s famous 700 percent increase of 2010 to the state of Kansas’s fees to Wiley’s recent announcement to limit downloads of articles to “100 full-text article/chapter/encyclopedia entries per day based on the previous day’s usage.” HarperCollins’s twenty-six-loan cap for e-books is best understood in the same light. Libraries should not be surprised anymore, as this type of behavior is to be expected from copyright holders fighting for their own existence and profits. If we add to this the lack of first-sale protection, we can begin to consider what the future may look like if the players with power, money, and influence win the battle.
Forecasting E-content in a District Public Library

At Mesa County Public Libraries (MCPL), we decided that there was enough data to project several different forecasts given a number of assumptions we could include. Based on the reasoning presented above, it seems sensible to assume that all content producers are motivated to migrate content to digital formats exclusively. Reference materials and pulp fiction are the most obvious choices, as the value of these materials is related to their content and little value is placed in the format or medium. We have seen this most famously with the end of Encyclopaedia Britannica’s print editions. Britannica is simply emblematic of the larger trend, and is useful only in that it forced many doubters to acknowledge the potential reality facing libraries. It is safe to assume that content producers in all formats are looking at migrating additional content to digital formats exclusively, as they can increase profits and retain greater control of copyright.

Given the examination above, it may seem reasonable to start with our music collection, but we opted against that genre for numerous reasons. First, music does not represent a significant part of our collection and is less critical to patrons than books and movies. Second, library music collections are being rendered irrelevant by online services like Spotify and Pandora. Indeed, some urban libraries are already reporting drops in CD circulation that could be the first signs of the death of library popular music collections. But even in libraries like MCPL where CDs still move, they are not a significant part of our circulation, which corresponds well with libraries across the nation. As has already been argued, the music industry is the most mature digital market and serves as an excellent indicator. Because libraries have been so slow to respond to digitization, it is probably too late for libraries to develop plans for digital music given how crowded the market already is and how low the cost is for consumers to enter that market. There is much more that can be said about this issue, but it is outside the scope of this article. Suffice it to say, music is not a good genre for our forecast.

While DVDs represent a significant part of our circulation, we decided to use OverDrive and limit the forecast to e-books. Books represent roughly 50 percent of our circulation in comparison to DVDs, but there are bigger and more compelling reasons for using books as the key indicator. Books loom larger in the image and identity of libraries, and our past, present, and possibly future are deeply tied to their existence. The vast majority of our physical space is dedicated to books, and a disruption in this market threatens our services and identity in ways a loss of DVDs simply cannot match. In spite of all the activity and energy focused on developing new iterations of libraries as place, libraries as services, libraries as outreach, our identities and services remained anchored in books. Specifically, in the physical format of books. This is why e-books continue to dominate our discussions and command our attention, in spite of the clear need for a broader focus on e-content. We were also conscious of this trait among our colleagues and realized that forecasting trends for e-books would have a much greater impact on our colleagues than any other format.
Our first problem was that the market is so volatile. Costs have not been as stable as we would like, which is understandable given the nature of the evolving market. We also have emergent models like the Douglas County “ownership” model that are turning the standard model upside down. The question was how to develop a price model moving forward. Given this instability, the safest route was to look at movie licensing for streaming, which is another model that has enough maturity and stability to provide several clues. First, the industry seems to assume some kind of annual cost model. At its simplest, this takes the form of paying \( x \) dollars per year per title during the length of the contract. Even in contracts where an entire catalog is licensed this can be the underlying cost model. It is not always, but it seems that the industry finds this a satisfactory model. It is critical to note the difference between organizational licensing and individual licensing. While Netflix or Amazon Prime costs a few dollars per month per year per user, Amazon and Netflix are gambling that they can distribute their massive annual licensing fee as an organization across millions of users. For most libraries this is an unsustainable model for video content. Only libraries with millions of patrons in their tax base could even entertain such a model. Libraries are too limited geographically and numerically to distribute these types of licensing fees across millions of users like Netflix does. Moreover, as its shrinking digital catalog suggests, this may not be a sustainable model for Netflix either. It remains to be seen if Netflix can continue to offer enough content at its current consumer price to have long-term viability. Also, one of the most commented-upon effects of digitization on distribution markets has been the elimination of traditional middlemen, and Warner Brothers’s decision to remove its entire catalog from Netflix evinces a growing awareness on the part of copyright holders that marketing is more important than distribution.

Assuming that e-book licensing will eventually settle into an annual cost per title for libraries, the next relevant question is what those costs will look like. Given the behavior of publishers, not withstanding Macmillan and others’ willingness to develop more library-friendly models, the behavior of the Big Five publishers indicates an interest in raising the cost per year above the cover price of the print version. While such a suggestion is anathema to librarians, there are legitimate reasons for this model. First, as has been noted previously, there are reasons to doubt the Pew survey that suggests e-book borrowers are also e-book buyers. The more mature digital markets indicate a commodification trend for items that were previously not treated as commodities. The simple act of digitization is having a significant effect on consumer behaviors and attitudes about that content. What the ultimate result will be remains to be seen, but we have ample evidence suggesting that an ecosystem awash in content is an ecosystem that drives content value down. If consumers begin seeing books as commodities, their motivation to purchase is significantly reduced, provided libraries offer easy access to digital versions. In such an environment, the fears of publishers regarding a negative effect on overall sales is at the very least a reasonable one, justifying a higher annual cost per e-book rather than a lower one.
Over a typical twelve-month period, MCPL pays an average price of $17.98 for any type of print book. The American Library Association does excellent work tracking public and academic library expenditures. Without delving deeply into the data, it is critical to note that MCPL is neither at the high end of the expense curve nor at the bottom, but is fairly representative of the “average” public library. Academic libraries probably report different numbers due to smaller print runs for scholarly materials, but it is safe to assume that the numbers have not shifted drastically at any point in the past few decades. It also is safe to assume that the average price of a print book has steadily crept upward, and that all libraries have been able to make their collection-development budgets work and meet the needs of their patrons within reason. This is not to minimize the pressures libraries have reported in recent years as budgets shrink and costs rise. Rather, it is to set up the stark contrast between challenges in the print age and challenges in the digital age. Using OverDrive’s current costs and assuming some of the above forecasting, we placed the average cost of an e-book at $35.85 annually for Mesa County. This is quite different from neighboring Douglas County Libraries numbers in their ongoing reports on average costs of e-books vs. print (see figure 1).

FIGURE 1. Pricing Comparisons

The images above are taken from a pricing comparison Douglas County has conducted the past few years for bestsellers. The goal is to draw awareness to the discrepancy in pricing between e-books and print books. The highlighted field is quite shocking as e-books are generally five to six times more expensive than their print counterparts. The problem is that the numbers are difficult to
pin down as various libraries have individual contracts with the vendors and pay different hosting and maintenance fees. MCPL recognized the need to create an annual cost for an e-book, because budgets run annually and that number is the one needed to forecast the impact a shift to digital would have on our budgets and collections. We factored in a wide array of variables before developing the $35.85 number reported above. We looked at the average shelf life of their print counterparts, figured in the twenty-six-loan limit for HarperCollins, averaged out or related the cost of lower-circulating items to those that have high circulation, and other variables. Another challenge is that the factored cost per title for hosting and maintenance will actually go down the more titles purchased. Neither were we able to factor in any kind of reduction in cost for technological advancements, as we have seen little movement away from Adobe Content Server (ACS), and the annual fees for ACS have not been stable the past five years. While we were not able to develop a precise formula for calculating the cost, we eventually settled on $35.85 as a reasonable cost per title per year given current trends and costs. Of course, given the volatility of the market described in the first part of this article, this number could change at any time. What is critical for librarians to understand is the need to begin assessing the actual cost of e-content on an ongoing annual basis, as similar pitfalls are embedded in services like Freegal (music) and Hoopla (pay per circ video streaming).

While the initial estimated cover price of e-books is quite a shock, the real cost is incurred at the annual level. Library budgets have developed in a book market where the first-sale doctrine protected libraries from annual license costs. By using our collection development statistics and annual budgets from the past, we were able to calculate a very accurate average cost per book over a twelve-month period at $17.98. We are extremely confident in this number, because like most libraries we keep meticulous records and calculating that number was fairly straightforward. It means that over a ten-year period we purchased about ten different books for $179.80. But in the new annual licensing model, assuming that our estimated cost of $35.85 per year per title is correct, the $179.80 above would only pay for one title for five years. It is easier to visualize than read:

**Under first sale:**

$17.98 \times 10 = $179.80 \ (for \ ten \ different \ books \ over \ any \ given \ ten-year \ period)

**Under annual license model:**

$179.80 \div 35.85 \approx 35.85$

Take the $179.80 spent on ten books over a decade, and divide it by the estimated cost per year for one title, and the real problem surfaces. Libraries would be spending the same amount they normally spend on ten books in ten years on a single book in five years.

If the digitization “trigger” event described earlier occurs, or if the same natural migration happens the way it happened in the music (and potentially video) industry, print books slowly will begin to cease production and be replaced by
digital-only versions. This is the question on almost everyone’s minds, and far beyond the scope of this article. Indeed, we could fill this entire journal issue with articles devoted to the subject and not have done it justice. For reasons already stated, discussion of the “death” of print may be premature, but at the same time it remains a very real possibility. Assuming that this possibility were to take place at a 5 percent migration rate, MCPL would start to see a significant decrease in materials inventory almost immediately. By “5 percent digitization rate” we are assuming that publishers migrate 5 percent of print books to digital formats exclusively each year. We used a 5 percent digitization rate because it is conservative and resulted in catastrophic results. We also capped it at 20 percent simply to make our calculations easier, and stopped at year nine because the final results were shocking enough without moving to year ten. Because budgets have remained relatively flat over the past five years, we assumed a relatively flat budget over the forecast period. This is a critical assumption because one of the options for libraries would be to increase budgets, but as will become evident, it seems highly unlikely that the type of budget increases libraries would need in a digital market will ever be feasible. It is easier to visualize than describe (see figure 2).

**FIGURE 2.**
**E-content and Print Purchases as a Percentage of Budget**

We added a 6 percent jump in e-content purchases in 2013 because that reflects our real numbers. Assuming that libraries still will want the digitized titles—and those titles are available—in nine years, e-books would make up about 75 percent of our purchases compared to 25 percent for print materials. It seems safe to assume that most public and academic libraries will experience a similar inversion in the amount of print to digital holdings. The graph is intended to show how radically our holdings would change over a nine-year period in a print-to-digital transition.

Things really get grim when looking at what the cost would do to our overall materials inventory. Given the price of e-books and the five-to-one loss ratio described above, libraries will either have to increase their collection
development budget by a five-to-one ratio every five years to maintain the same overall number of items and/or weed less. For public libraries where recently published materials represent the bulk of circulation, more and more funds will need to be diverted to those popular items. The problem, however, is that the loss will be significant enough that it cannot be hidden (see figure 3).

**FIGURE 3.**
**Materials Inventory**

The graph visually demonstrates the five-to-one item loss over a nine-year forecast. The most obvious visual is that the e-book collection does not grow fast enough to compensate for the loss of print items. The total collection moves from 250,933 down to 165,719 over nine years. This loss actually is less than it would be if we were to continue weeding at the current rate, but we built in a reduction in weeding a few years into it, because we realized that the shelves would start to look bare or we would need to significantly re-plan the physical space in order to accommodate the loss of items. Ironically, this aggregate loss of items is happening at exactly the same time our patrons are being conditioned to expect more content due to streaming trends. It is possible that libraries will be able to shift music and video budgets into book budgets, since those collections may be irrelevant in this same time period, but such a move to reduce formats goes against the general trends our patrons are experiencing and are conditioned to expect. It is possible to cut databases to pay for e-books, but again, this represents a step backwards toward a significantly less comprehensive collection than before.

For emphasis we put the aggregate loss numbers into a series of pie charts of which the first and last one are presented here (see figure 4).
In nine years, we can expect about a 25 percent aggregate loss of materials in our collection. The reduction eventually will slow down when the loss curve and the cost of e-content hit equilibrium, but it is impossible to imagine what will happen to libraries before that happens. In spite of all our efforts to reinvent libraries, our core services still revolve around the lending of materials. Patrons still come to us for content, but if publishers and other content producers finally decide to begin migrating to e-content exclusively, and we find ourselves in an annual licensing model, we will not have enough content to satisfy patrons used to unlimited content supplied by YouTube, Spotify, and the like.

Moreover, this forecast does not even begin to address the fundamental problem between our older “one-user-per-item” model and the streaming model that has become the mainstay of the online user experience. While new services like Hoopla are offering streaming content to libraries, a quick survey of Hoopla’s catalog suggests that libraries might be better off paying staff to simply catalog all of the free content available on YouTube, Crackle, and Hulu. Even if such services required constant checking to see when content goes offline, it may still be more cost-effective than paying for yet one more content silo.

In conclusion, we can hope that the above forecast will prove false for a number of reasons. First, the licensing model for e-content has not been settled and may reach a much friendlier price point than the one outlined here. Second, digital first sale may become a reality. But Hollywood and other powerful players are spending millions of dollars working for a model that benefits their bottom line. Libraries can and should be pursuing their current courses of action, but clearly some other lines of action are warranted. It is also possible that the price forecast here may be overly optimistic, in which case the above scenario gets much worse. Forecasting and futurism are a dangerous and imperfect science, especially in the digital economy. This is due not just to the volatility of the radical changes in the foundational economic assumptions like a loss of scarcity, but also because technology continues to evolve and change at a rate no other historic transition can match. While this forecast is serious and significant, unforeseeable changes in the law, in the economy, or technology could render it irrelevant in the very
near future. Or it could be a very prescient look forward. Regardless, the dangers facing libraries are clear and significant.

Laws can be made through lobbying or they can be written retroactively as a response to an existing situation. Getting out in front of the law the way Douglas County Libraries has done is a critical step, as it demonstrates both market viability and proof of concept to wary content producers. Finally, libraries need to rethink their services and organizations from the ground up. Once content begins making the migration to digital-exclusive formats, everything from our service model, our personnel and hiring, and our physical footprint will be challenged. Librarians too often approach these challenges as if they are superficial changes rather than comprehensive ones. Everything we have known will be challenged in a digital world, and we should begin making contingency plans now, because, as we saw in the forecast above, we cannot pretend to survive with 25 percent of our content gone in nine years. We should be planning now for the worst scenarios, and be ready to execute those plans when we see which scenario will eventually play out in the wait for digitization. Above all, we need to advocate and negotiate for an affordable pricing model regardless of what the eventual outcome is.

ABOUT THE AUTHOR

Joseph Sanchez is a nationally recognized leader on e-books, e-content, technology, and intellectual property in public libraries. A pioneer in circulating readers as well as in makerspaces, he is keenly interested in the successful evolution of libraries to meet the challenges of new technologies. Currently director of Mesa County Public Libraries, he previously served as library and learning resources director at Red Rocks Community College from 2006 to 2011, where he managed an urban academic library that had a diverse patron base. He has also led a team of employees responsible for multimedia content production at Auraria Library in Denver. Sanchez is an adjunct professor for the Library Science School at San Jose State University and was a 2011 Library Journal Mover and Shaker.
When you arrive at the Associated Press (AP) headquarters on West 33rd Street in New York City, the first thing you notice is the massive footprint of a large building: it’s a squat pyramid that stretches from West 31st to West 33rd Streets, consuming a half block between Ninth and Tenth Avenues. Once inside, you discover a unique interior with thousands of square feet of contiguous space on a single floor—you get to thinking about the need for open access, uninterrupted space, and speed. Always increasing speed.

You’re not surprised to learn that AP moved here from its headquarters at 50 Rockefeller Center, swapping typewriters and keypunch operators for new technology. For more than six decades, writers and photojournalists performed their jobs at that location until the building became inadequate for housing all of the AP’s operations and meeting its technology needs. In addition, the building’s design separated news departments, instead of making it easier for them to work together. The new location allows for AP to perform in the twenty-first century.

The AP has been breaking news since it was created in 1846, when five New York City newspapers banded together to fund a Pony Express route through Alabama in order to bring news of the Mexican War north more quickly than the U.S. Post Office could deliver it. The first step taken by the new organization was to perfect operating procedure—and it has not stopped taking further steps: just go inside the building at West 33rd Street.
Inside the archives in the building’s basement you will discover thousands upon thousands of stories that jump off the page, a veritable tour of American history: It was the evening of August 17, 1858. President James Buchanan examined a remarkable message before him:

THE QUEEN [Victoria] IS CONVINCED THAT THE PRESIDENT WILL JOIN WITH HER IN FERVENTLY HOPING THAT THE ELECTRIC CABLE, WHICH NOW ALREADY CONNECTS GREAT BRITAIN WITH THE UNITED STATES, WILL PROVE AN ADDITIONAL LINK BETWEEN THE TWO NATIONS, WHOSE FRIENDSHIP IS FOUNDED UPON THEIR COMMON INTERESTS AND RECIPROCAL ESTEEM. THE QUEEN HAS MUCH PLEASURE IN THUS DIRECTLY COMMUNICATING WITH THE PRESIDENT, AND RENEWING TO HIM HER BEST WISHES FOR THE PROSPERITY OF THE UNITED STATES.

This is an extraordinary document. The success of the transatlantic cable revolutionized news transmission. Other stories like the AP’s effort to secure reliable election returns ring out. On December 11, 1860, the New York Times carried a dispatch from Fort Kearney, Nebraska, reporting that “the California Pony Express passed here at five o’clock this morning and left the following to be telegraphed to the Associated Press.” These were the results in California of the recent presidential election, securing Abraham Lincoln’s victory over Stephen Douglas. Here you learn how correspondent Joseph I. Gilbert borrowed President Lincoln’s handwritten text of the Gettysburg Address to copy it. “Gilbert’s account of Lincoln’s speech stands as the most accurate version of what Lincoln said that day.” You find unfailing examples of dedicated reporting: “I go with Custer and will be at the death,” AP reporter Mark Kellogg wrote before General Custer’s final stand against the Sioux. Kellogg perished on June 25, 1876, along with much of the Seventh Cavalry at the Battle of the Little Big Horn. On January 17, 1917, cryptanalysts in the British Admiralty partially deciphered a note from German Foreign Minister Arthur Zimmermann to the German ambassador in the United States, a note that when finally released would shock much of the American public out of its neutral stand and help bring the United States closer to war. This was the famous “Zimmermann telegram,” and it was released to the U.S. public by President Woodrow Wilson through the Associated Press, on February 28, 1917. In 1945, Joe Rosenthal, a young AP photographer, shot one of the most memorable photographs of the Second World War, a simple image of five U.S. Marines and one Navy corpsman raising the flag on Iwo Jima. It took Rosenthal 1/400th of a second to execute the photograph. It’s immortalized in bronze as the United States Marine Corps War Memorial in Arlington, Virginia.

One reason for the AP’s longevity has been its ability to adapt quickly to new technologies. We believe that the digitization of its vast historical annals is one
more step in this direction. Getting access into these remarkable archives and making them available to researchers is just one of the stories we aim to tell here.

What We Do

Cengage Learning is a large publishing enterprise dedicated to academic excellence at all levels of learning. We provide innovative research solutions that bridge the space from the library to the classroom. We’ve been doing digital publishing for more than twenty-five years, longer than almost any other publishing company, and we’ve become expert at digitizing and highlighting rare and sensitive historical material. These are among the many reasons why eminent institutions such as the British Library, Oxford University, Harvard, and Yale consider our Library division, Gale, an ideal partner. We also have extraordinary contacts within the scholarly world, so we can draw on experts to help us shape products and define their content strategy. Many of these scholars have served as editors of our print reference and textbook titles.

The core of our mission is the creation and maintenance of online databases. By creation we mean the publishing (or the release) and the hosting (after release, twenty-four hours a day, seven days a week) of digital images on a world-class platform—the “front end” of a user’s experience. Like our published books, such as the Encyclopedia of Religion and Dictionary of American History, which first appeared under our Macmillan and Scribner imprints, each of our digital archives has a mission of its own, along with concrete dimensions (such as number of pages, images, document types, and document numbers). We say “concrete” because unlike much of the “stuff” that floats across the Open Web, like fragments in the ocean, our “content” is thoughtfully constructed. The story of this construction—the initial stages of online database development, the process of content sourcing and selection, the subtleties of curating, the physical challenges of preservation and digitization, the processes of review and revision, as well as software and technology building and user testing—is the subject of this guided tour. We’ll offer details on active partnerships using case studies of past and current archives—and some vision for the future.

Case Studies, and a Word about Our Users

At Gale, we build products to solve research problems, from the elementary to the erudite. We build products to answer research questions. In many instances these questions are posed by a “power user,” a trained academic with specialized knowledge, comfort reading foreign languages, and advanced ability deciphering complex texts. The power user’s skills stand in sharp contrast to those of a high school student or “general interest” researcher.

For this reason, we offer a variety of case studies to illustrate a range of levels and relationships. In addition to our partnerships with great institutions,
Stepping through the Exhibit Glass

these studies include detailed stories that delve deep into the documents in the archives. We will explore a few examples—the world behind American news reporting; science in the nineteenth century; and the centuries-old sources of English literature. By moving from the bird’s-eye to the worm’s-eye view—we trust not too jarringly—we invite readers to fathom just how we bring life to documents and images in our online databases. Our goal is to illustrate the challenges of digitization and to answer fundamental questions: What kinds of tools are needed for researchers to interact with content in the most productive way? How do publishers and their partners decide what to digitize? How do online documents support new research discoveries?

“The Future of Scholarship Is Digital”: Nineteenth-Century Collections Online

In *The Nineteenth-Century Press in the Digital Age* (2012), media historian James Mussell announced with supreme confidence: “The future of scholarship is digital.” We agree, and Nineteenth Century Collections Online (NCCO) heralds this future. Because NCCO places strong emphasis on the inclusion of a variety of document categories often found physically in disparate locations, the careful aggregation of materials into unified collections endows each document element—whether a piece of ephemera or a newspaper article—with added value.

Our partnerships with institutions (including the British Library, National Archives and Records Administration, Bodleian Library, Manchester Statistical Society, London Metropolitan Archives, and the Library of Congress) resulted in the first groundbreaking NCCO archives published in 2012: Asia and the West: Diplomacy and Cultural Exchange; British Politics and Society; British Theatre, Music and Literature; and European Literature, 1790–1840. In 2013 we followed with four additional NCCO archives: Photography: The World through the Lens; Science, Technology and Medicine, 1780–1925; Europe and Africa: Commerce, Christianity, Civilization, and Conquest; and Women: Transnational Networks. For 2014, we are planning four more archives, with others planned for future years.

When we launched NCCO in 2012, scholars immediately told us, “You’ve created amazing software here—the research tools are exactly what we need.” This struck a positive chord and what emerged was a vision to provide all of Gale’s digital collections, including the ones already published, with the full range of tools we developed specifically for NCCO—for example, data analyzers, graphing functionalities, subject indexing, personalized accounts, and a search methodology we call “term clustering” that restores serendipity to search. So, in early 2013, we began moving the entire Gale Digital Collections program into a new integrated research environment called Artemis—purposely built for scholarly research in the humanities. All of the tools and services available in NCCO are being extended to all of Gale Digital Collections, including Eighteenth Century Collections Online (ECCO), our historical newspaper collections, Sabin
Stepping through the Exhibit Glass

Americana, Making of the Modern World, and Making of Modern Law. With this, we foresee a world where product packaging and time frames will matter less, and content selection and value will matter more. Thus, the scope of NCCO as we understand it today will broaden to include something much, much larger. We’ve also expanded Artemis to our literature program, extending all of these advanced research tools to a large set of literature content.

Let’s examine just one partnership—the Huntington Library—which is one of the largest and most complete research libraries in the United States in its fields of specialization, and the contributor of two million pages to NCCO: Science, Technology and Medicine, 1780–1925.

Where does this story begin? As far back as 1941, when Bern Dibner, electrical engineer and industrialist, built the Burndy Library, whose holdings included scientific literature from antiquity to the twentieth century. In 2006 a large portion of the Burndy holdings moved to the Huntington Library in California as a gift of the Dibner family.

The history of the Huntington collection prior to the Dibner gift also is worth recounting because it illustrates its unity as an assembled collection. Let’s take an even deeper dive into the genesis of one of the Huntington collections now online in NCCO: namely Evolution and the Origin of Species. The gift of William Mohr, a great collector of books by and relating to Charles Darwin, it consists of caricatures, engravings, photographs, thousands of different book-form editions of Charles Darwin’s writings, and more than 500 supporting volumes by contemporaries and followers. The other substantial piece of nineteenth-century evolution-related works at the Huntington is the John A. Moore Gift, which was added to the Mohr Collection. Moore collected volumes that dealt with the reception of Charles Darwin’s views in Europe and the United States, paying particular attention to works that highlight religious and cultural conflict. Because the topic of evolution is allied with religion, there are relevant books on biblical creation, especially as it contrasts to evolution. When Gale arrived at the Huntington for this project, curators in the history of science worked with us to bring all of these pieces together and fashion the online selection of this archive.

Now let’s connect all of these archives to the classroom, which is what we do as publishers. Considering undergraduate courses at today’s universities and the researchers who teach them, with course titles such as “The Darwin Revolution: An Introduction to One of the Major Intellectual Transformations of Recent Centuries”; “Rethinking the Darwinian Revolution: With a Special Interest in Tracking Evolutionary Ideas in Victorian Literature”; and “The Darwinian Legacy: The Origin of Species by Means of Natural Selection, and Its Scientific, Intellectual, and Political Legacies,” let’s make the vital leap from the archives . . . to the online documents . . . to the tools needed for twenty-first-century researchers to interact with content in the most time-efficient ways.

Time efficiency is a key component in the story, as well as cutting-edge tools that make the digital records more powerful than the printed books in the stacks. Textual analysis tools (graphing and search-term cluster tools) help researchers identify and visualize patterns, trends, and relationships among content.
Comprehensive subject indexing makes the content accessible, exposes key elements within the data, and reveals important topics, people, places, and dates, identifying relationships among documents. An advanced image viewer enables users to zoom, highlight, rotate, reverse (i.e., see the negative image, which, like an X-ray, is sometimes clearer than the positive image), and view individual pages in full-screen mode, with the ability to adjust brightness and contrast, making it easy to read weathered and varied types of documents.

In multiple ways the online experience helps the workflow of the researcher. Through Gale archives, historians can trace the first instance of a term across hundreds of years of publishing; they can uncover trends and pinpoint precisely when a concept gained traction, or how a word’s meaning shifted gradually over time. Think of the example of the Darwin-related materials contained in multiple collections across multiple archives and multiple institutions. When assembled in a single place, these materials become ever-more compelling: we may search a concept, for example, “evolution” or “natural selection,” across time and locations and subject disciplines. And so the multisource digital archive both fixes the content in its place in the library and liberates it at once, juxtaposing it next to other subject areas and document “types”—popular novels, works of theater, newspapers. The result is that Gale’s massive module, NCCO: Science, Technology Medicine, which supports the general trend for enhanced “scientific literacy” and complements the movement toward the integration of science-technology-society themes into contemporary educational programs, coexists with other non-pure science NCCO archives (Photography; British Politics; Europe and Africa; Literature 1790–1840) and becomes something enhanced, bigger than the sum of its parts. This means that

Term Clusters assist students in thoroughly developing their research topic. By organizing commonly occurring themes, this tool reveals hidden connections to search terms—helping students shape their research and integrate diverse content with relevant information.

Term Frequencies aid students in identifying central themes and ideas. Students can now see the frequency of their search term within content to begin assessing how individuals, events, and ideas interacted and developed over time.
a search for a term in the NCCO archives (and beyond, in the totality of Artemis) may render results in places the researcher may not expect: a reference in a literature archive to a scientific term; a “politics” reference in an archive on the arts. The online archives, containing the equivalent of hundreds of thousands of linear feet of library shelves, actually are—in our judgment—more powerful, more valuable than the content within the shelves themselves.

Gale’s Partnership with Associated Press (2014), and Some Words about Our Scanning and Metadata Operation

In April 2013, Gale announced an agreement with the Associated Press (AP) to digitize their corporate archives, including millions of pages of news copy, bureau records, correspondence, and related documents. Our product-development team met with AP reps and toured the archives at its headquarters on West 33rd Street in New York. AP archivists provided detailed summaries of its corporate archives collections, which document nearly everything in the vault, and they highlighted certain collections of interest. Our editorial team analyzed the holdings and suggested “groupings”—sizeable collections to be shaped thematically. Historians advised us at the outset and considerable market testing at all levels—school, public, and academic libraries—shaped our thinking. In effect, the market told us what it wanted. The result: three archives for 2014—News Features & Internal Communications; to be followed by The Washington, D.C. Bureau Collection; and then The U.S. City Bureaus Collection.

A good way to think about these sources is to conceive of them as the “primary sources” of the news: the raw materials on which reporters based their stories. Then imagine tracking the AP archives across newspapers in Gale NewsVault (Gale’s primary platform for its historical newspaper collections) to chart the way a story traveled nationally and internationally. For example, if you are looking at the trigger for the diplomatic crisis of July 1914, the “guns of August,” and the outbreak of World War I (the assassination of Archduke Franz Ferdinand in Sarajevo on June 28, 1914), or the sinking of the British ship Lusitania on May 17, 1915 (which helped lead to United States entry in the war), then the tracing of wire reports is a crucial part of your investigation. Or perhaps you are investigating the first mention of a new concept (“television” in 1925; “atomic bomb” in 1939) years before its first prototype.

More details, and a look at a future collection: the general files document the administrative and editorial activities of the AP general manager and his designates. The subject files contain correspondence between AP editors, executives, and member publishers; wire copy; clippings; photographs; memos and reports on board meetings; news coverage and transmission, editorial policies; the photo service; the foreign service; major political figures; elections; and business matters for the greater part of the twentieth century. Through an understanding
of the archives, extensive market research, and advice from our advisory group, we determined that the chronological scope and the subject content of these files will allow researchers to investigate not only the history of the AP and of American journalism, but also the major historical events covered by the AP. Coverage of the Second World War is particularly well-represented. The foreign bureau correspondence documents news coverage abroad and the growth of the AP in Europe, Latin America, Asia, and Africa.

For the AP material—and here we offer a glimpse of the product workflow—our vendors will deploy several kinds of image scanners depending on the source material. For rare, fragile documents we use a scanning unit that averages 1,500 pages per hour while offering low-stress support of the documents, including a robotic arm incorporating a vacuum system to pick up and turn one page at a time more gently than a human hand could. If this unit is not suitable for the material or if the source institution requests an alternative, generally we rely on another device with a custom-made plastic “v” cradle support to hold a bound book, which is ideal for fragile bindings and book pages where robotics and glass cannot be used.

Our customers often ask us about optical character recognition (OCR) and metadata capture. The OCR process—which captures the “full text” of documents so the text can be searched—involves a high-level workflow. In essence, sophisticated software “reads” the document and generates a text file. Gale then uses proprietary technology to correct/improve the OCR text. This provides for a
richer, more accurate experience for the searcher. Our capture of metadata from the source material enriches the content and makes it “discoverable.” Additional capture of metadata elements allows for a flexible environment that is easily tailored to a specific collection. Gale’s “capture” is not limited to the full text. Other core elements of the document are routinely recorded and vary depending on the type of material; monograph, manuscript, periodical, or newspaper.

British Library Manuscripts Online

With the British Literary Manuscripts Online (BLMO), we move to an archive designed for advanced power users and their students. BLMO contains letters, poems, stories, plays, chronicles, and religious writings all in manuscript form. Its medieval documents include famous works of early literature, for example, Beowulf and The Canterbury Tales, and Renaissance authors such as John Donne and Sir Walter Raleigh. The roster of source institutions includes the British Library, Folger Shakespeare Library, Huntington Library, Victoria and Albert Museum, National Library of Scotland, Princeton University, and the University of California, Los Angeles.

The “case” for deciding to digitize BLMO was simple: English literature is the core field of study for students of English, and BLMO serves the needs of these students and researchers. Whereas Gale’s Eighteenth Century Collections Online (ECCO) consists exclusively of published titles cited in the English Short Title Catalogue (as well as titles published in the United Kingdom during the eighteenth century), BLMO includes unpublished materials. With ECCO, Gale was able to apply OCR technology to all of its content, allowing users to conduct full-text searching across the archive and to make unexpected discoveries from its thirty-three million pages. With BLMO, we enter the scholarly realm of the manuscript and ways of locating the page in a desired search.

Why does manuscript study have such a strong appeal? Manuscripts offer unprecedented opportunities to bring texts into the classroom; to engage students and scholars in “close readings” of the text; and to unlock history, culture, and context. They offer readers ways to achieve immediacy and closeness to the author, to provide a window into the creative process, to practice hands-on scholarship. Newly emerging areas of criticism emphasize the study of the materiality of the text, the instability of the text, and how a text evolved through an author’s notes (or an editor’s notes), spelling variance, revisions of galley proofs, and more. For a famous example of textual instability think of Hamlet and the First Folio reading “solid” in the first soliloquy (O, that this too too solid flesh would melt, in contrast to the early quartos rendering “sallied,” a word that fails to make sense in context but that editors understand as a variant of “sullied”). Textual analysis involves studying the variance of a single written word or phrase. In the nineteenth century we can examine an author’s first draft, which may be (in the case of Charles Dickens) an awful scrawl that is uncannily close to the finished published text. Manuscripts open a window into the author’s creative process.
Our academic advisors on BLMO addressed questions of the relative difficulty of both manual and electronic access. For instance, some manuscripts are barely readable in the original physical “hard copy,” and therefore some sections may not be readable online. To solve this problem, Gale created image viewers that help enhance viewing and readability. Similarly, often a single “manuscript” is in fact an entire box of miscellaneous items—only some of which are described in the institutional catalog. Here, we encounter a less-than-ideal path for discovery and navigation, at least in the original hard copies. What is to be done? Gale helps researchers go “behind the exhibit glass” presented by manuscripts by cataloging them more effectively than the source institution has been able to do so in the past. (We typically create an “e” table of contents that reveals nesting within boxes, within manuscripts, even within series of back-and-forth correspondence among two or more parties.) This gives researchers much greater “findability,” thereby enabling enhanced scholarship.

**Partnership with “The Nation’s Attic,” Smithsonian Institution**

We have been rather busy since 2013 when we announced our partnership with the Smithsonian Institution and how it will transform the library and research worlds by unlocking access to rare artifacts never before available. Air & Space and Smithsonian Magazine Archive is the first resource in the line of Gale-Smithsonian Institution collections. We’re currently conceiving and testing new product proposals, as we feel we are uniquely positioned to help the Smithsonian Institution meet key aspects of its grand challenges by supporting networking, dissemination, and knowledge creation.

In mid-2014, Gale will release two major collections sourced from the Smithsonian Institution: World’s Fairs and International Expositions, and Trade Catalogs and Trade Literature. The Smithsonian’s holdings in these fields are unrivaled, and scholarly interest is enormous. For example, with trade literature, researchers will have the raw material to examine the growth of industries as varied as mining, steam engines, petroleum engineering, weaving, and hundreds more, uncovering consumer trends, business interests, and connections between and among these interests, adding to the content already available in Gale Digital Collections. We envision new learning, new scholarship that ties together the humanities, the arts, business and more.

World’s Fairs present similar opportunities for new scholarship. Here researchers will encounter world’s fairs as points of intersection among the cultural politics of race, class, and gender. Sure to emerge are fresh examinations of cultural diplomacy, globalization, national identity, and the politics of display; the role of African Americans in international fairs and their desire to show the advances they had made since emancipation; the activities of women relating to the debates about women’s political and economic rights; how international fairs reflected and shaped the relationship between ethnic communities and
the dominant society; how Native American culture was portrayed in exhibits, and how these portrayals encouraged a change in white perceptions of native peoples. Working in conjunction with Smithsonian Institution librarians and museum curators, our editorial board will determine essential content for inclusion. It’s our goal that when published, the Smithsonian Institution archives will appeal to researchers across a spectrum of disciplines.

Meanwhile, as we put the finishing touches on the archives defined above, we are actively engaged with scholars to define the next archives, which will touch on space exploration; trade and industry; United States history; the arts—graphical, plastic, and performance—and much more.

**Partnership with the National Geographic Society**

Since its founding, the National Geographic Society has focused on geography, archaeology, natural science, and the promotion of environmental and historical conservation. The National Geographic and Gale partnership brings vast resources to digital life via the National Geographic Virtual Library (NGVL). This collection unifies an entire archive of every page of every issue of *National Geographic* magazine along with National Geographic books, maps, images, and videos. Among the first to use color photography, *National Geographic* magazine is widely known to contain the highest quality photojournalism in the world. Its stunning photography is found here.

Researchers of all ages and interests can see this vital partnership at work in the National Geographic Virtual Library. Searching for a global issue in context? Get into this dataset in any number of ways by exploring current topics of interest. In Search, for example, type the following into the search box: “arctic warming” or “particle physics” or “Syria.” Find immediate results on featured articles (“Shadowland: Syria”; “The Forgotten Faithful: Arab Christians”); books (*The Enduring Legacy of Muslim Civilization*); articles; map supplements; and magazine covers, among other results. Searching NGVL offers curious readers ample ways to conduct general research in ways that complement the library experience.

NGVL further offers users the opportunity to search keywords and concepts across different material types such as maps, books, magazine articles, and multimedia—an activity that would have been previously impossible, if not very difficult, until they were connected in the digital world through NGVL. The National Geographic Society has inspired people to care about the planet for more than one hundred years, and offering opportunities to perform advanced research to better understand our planet helps to foster that sentiment while also aligning with Gale’s goals to unlock digital access to rare content and artifacts.
Toward the Museum Experience

Now let’s imagine the future, how we may re-create a museum experience in 3D and its applications for study. Already we can link striking images to valued content. For example, at the Smithsonian American Art Museum we find portrait galleries. Let’s look at a famous 1832 portrait by George Catlin: Stu-mick-o-sucks, Buffalo Bull’s Back Fat, Head Chief, Blood Tribe. That’s the title of the painting! Google it and find it on the Smithsonian website with links to exhibits such as George Catlin and his Indian Gallery and Campfire Stories with George Catlin. Keywords on the site help to define with excellent precision the object in view: “Dress—ethnic-Indian dress; Ethnic-Indian-Blackfoot; Portrait male-Buffalo Bull’s Back Fat-bust; Portrait male-Stu-mick-o-sucks-waist length; Recreation-leisure-smoking; Painting; paint-oil; fabric-canvas.” Let’s imagine linking this object to Cengage content. Search the title of the work in Sabin Americana, 1500–1926, and find: Catlin, George. Letters and notes on the manners, customs and condition of the North American Indians. Volume 1. New-York, 1841. 351pp. 2 vols.

Within this title, see the author’s Letter No. 5: “The name of this dignitary of whom I have just spoken, is Stu-mick-o-sucks—the buffalo’s back fat, i.e., the ‘hump’ or ‘fleece,’ the most delicious part of the buffalo’s flesh.” Connecting Catlin’s letters to the images is just one instance of how an online “virtual” experience may enhance research. And Sabin Americana is only one of many Cengage resources that support research on the Blackfeet, the Crow, and other Native Americans.

Imagine finding a work of sculpture and circling it 360 degrees or entering a domed building; or seeing objects of industrialization: a railway car; a sewing machine; a repeating rifle; a self-correcting electric typewriter (since the 1980s an antiquated relic). Or a battlefield or motion picture film set re-created as a diorama. Imagine these “objects” connected to genuinely valuable content. Historians tell us that the Smithsonian Institution is a unique repository of material culture, and that this culture soon may be lost to the coming generation. Today’s undergraduates have trouble grasping a world before “apps” and instantous on-demand programming. It’s an often-told joke that young viewers have trouble understanding why Clark Kent needs to find the privacy of a phone booth to change into Superman. Doesn’t he own a Droid? Students will not remember what it was like to watch 1970s television shows like All in the Family broadcast on an old-fashioned cathode-ray tube encased in a piece of furniture in the family living room, nor do they grasp radio’s impact in 1930s Depression America. The museums of the Smithsonian Institution preserve the materiality of our history. And if we imagine Cengage content linked to it, we conceive of something even more valuable to the researcher because any topic may live in multiple museums or venues. It’s our job to make these connections. The virtual museum experience becomes even more instructive than the conventional “in person” experience. The future of research is online.
ABOUT THE AUTHORS

Jim Draper is vice president and general manager at Gale, part of Cengage Learning. He has been in the publishing industry for twenty-five years, as author, editor, online developer, print publisher, digital publisher, academic publisher, business-development director and rights director. Today Jim manages the Gale business for Cengage Learning and his responsibilities include Gale Digital Collections, Charles Scribner’s Sons, Macmillan Publishing, Gale Online Databases, and a variety of other Gale imprints and services. Jim is a graduate of Princeton University and holds a postgraduate degree in medieval languages from Oxford University.

Stephen Wasserstein is a content developer at Gale, part of Cengage Learning. He has worked for more than twenty-five years in various aspects of the publishing industry as a writer, development editor, acquisitions editor, book producer, and creator of digital archives. He manages Gale’s legal history archives known collectively as Making of Modern Law, and he developed Science, Technology and Medicine, 1780-1925, in Nineteenth Century Collections Online. Stephen holds degrees in history from Boston University and Brown.
E-book Devices
An Overview for Libraries  by John Burns

IN MY PREVIOUS article (featured in the Fall 2013 issue of eContent Quarterly), I expounded upon the file formats (including Adobe PDF, EPUB, Kindle Books, Apple iBooks, and several others) found in today’s market for e-reading. In this article, I will detail the most popular devices that display those file formats, so readers can enjoy the bounty of digital content available. For today’s mobile, tech-savvy lifestyle, devices for e-reading fall into three main categories: smartphones, tablets, and dedicated e-readers. While it can be argued that laptops could constitute a fourth category, I would argue that laptops, while useful, are the mobile device of yesteryear. I stick by this statement even with the advent of netbooks. Netbooks are far more portable and even laptops, like the MacBook Air, are amazingly light, but that whole lifting the lid and external keyboard thing is “so last decade.”

In a presentation posted on the pewinternet.org website titled “Public Libraries in the Digital Age,” Kathryn Zickuhr and Mary Madden report that 29 percent of U.S. adults own either a tablet or an e-reader device for e-reading. They further assert in this report (given on April 25, 2012) that Kindle holds 62 percent of the market of eighteen-plus aged e-reader owners in America. The growing popularity, sophistication, and dissemination of these devices are remarkable as they are making it easier to read wherever and whenever. Who doesn’t want to have a world with more reading; e-readers and e-reading are making that happen.
Smartphones

The market is saturated with modern, high-tech smartphones—there is a plethora of options available with respect to brand, operating system (OS), features, and so on. As smartphones have become “smarter” and more feature-rich, their ability to provide a useful and convenient reading platform has increased. Apps, and the integration thereof, are overwhelmingly responsible for this as they are providing simple software solutions to many useful tasks like e-book reading. “App” is short for “application” and simply refers to the software that often is downloaded as opposed to loaded from a disc. Apps are much smaller, compact, and less feature-rich when compared to regular software packages like Adobe Photoshop, Microsoft Office, or Apple’s Final Cut Pro, for example.

When purchasing a smartphone, it really becomes a choice of what brand, operating system, and features you desire. Regardless of what smartphone you select, many apps do a fine job of displaying e-book content that you can procure. The most basic and fundamental reading app that is very serviceable and free is the Adobe Reader. Thanks to that app alone, students that use my library are able to download e-books, journal articles, newspapers, and other documents in the PDF file format and read them on their smartphones without having to set foot in the library. The second most useful and ubiquitous e-reading app is Amazon’s Kindle app, followed closely by Barnes & Noble’s Nook app and Apple’s iBooks app (Apple devices only). All are free and allow users to read any of the top four file formats, with each app working with specific file formats (PDF, EPUB, Kindle Books, and iBooks). If you are looking to borrow books from a library, there are apps for that as well. For example, OverDrive, ebrary, 3M Cloud Library, EBSCO, and Safari Books are great examples of platforms for borrowing e-content from a library. If there is not an app to perform this function, the vendor will supply some other means. For example, OverDrive, a leading e-book borrowing vendor in U.S. public libraries, provides a service called OverDrive Read, which allows access to content with just a web browser and an Internet connection.

Often, as a librarian, you may be required to offer advice and guidance regarding smartphones and how they pertain to whatever lending model you offer. Keep in mind that the major e-book and e-content lenders will have apps and you need to make your patrons aware of this. They will want to make sure an app is made for their particular smartphone. If an app is not available for their smartphone, it is best to visit the e-content lending vendor/provider (OverDrive, for example) to see how one might go about accessing content without an app. It is in the interest of the library vendors, of course, to make alternative methods of access available and as easy as possible for the end user.

Lastly, librarians may find themselves explaining to the patrons the difference between a smartphone and a cell phone. When faced with this challenge, and I often describe it to patrons by drawing parallels between smartphones and actual computers. I explain that many of the features a smartphone has and, consequently, that a cell phone does not, are due to one being a small computer and the other being only a phone. This is also where I add in information that
ensures understanding of Wi-Fi vs. a cellular connection (i.e., 3G, 4G, LTE, etc.) and the implications that e-content can have on various smartphone data plans.

**BRANDS**

There is a dizzying array of brands and manufacturers of smartphones today. Big names include Apple (iPhone), HTC, Nokia, Samsung, Motorola, Microsoft, and LG, to name a few. Brands are a very subjective matter to explore, as loyalties to any brand are as individual as the person. Is one brand or manufacturer better than another? That is entirely a matter of opinion. The brand is only as important as the features and quality it represents and offers. Look first at features and then make a determination based on the next category—operating system.

**OPERATING SYSTEMS**

Brands and operating systems are closely intertwined. The OS will greatly influence the apps that are available to users as each OS supports certain apps specifically made for it. Fortunately, many of the great e-reading apps (e.g., Kindle app, Adobe Reader, Nook app) come in versions for all the different smartphone operating systems. Smartphone operating systems are largely self-contained and can be managed on the phone itself without the need to plug the phone into a computer. This feature is of great importance to libraries that have computers for patron use. The library no longer has to worry about the messy situations that can come into play with having to sync content with a computer. Though there are devices that still utilize computer syncing (some iPods, for example), the dependence on the computer has been dramatically reduced over the years. The priority for libraries now is making sure that the Wi-Fi is robust, wide, free, and fast. Though provision of computers is still paramount, more and more patrons want Wi-Fi. They also will seek librarians out for training, workshops, and resources to learn all about their devices and the products available for lending materials.

The brand of smartphone you choose will most likely carry one of three major operating systems. The first of these is the Apple OS (referred to as iOS). Like any operating system for a computer (Windows XP, Vista, 8 or OSX for MACs), the smartphone operating systems are constantly being updated. In a very real way, the OS for a phone is similar to the OS for a PC, given that the word smartphone has a lot to do with the fact that the phone has become a small computer.

The OS for your smartphone influences the brand you will opt for as different brands go with certain operating systems. For example, you can only get iOS7 on an Apple device, and an Apple device physically won’t run the Android (or any other) OS and vice versa. Apple’s OS will give you many options for apps (via the Apple Apps Store) and will include the Apple-exclusive iBooks app, which is not currently used in any library lending model.

The second major OS on the market is the Android OS, which, arguably, enjoys as large a market share as Apple. A helpful feature of the Android is that many
manufacturers embrace it, so a phone made by HTC could have the Android OS, but so could phones made by Samsung, LG, Motorola, and so on. Apps for this OS are primarily found using Google Play.

The third primary OS on the market is the Windows Phone OS, created and maintained by Microsoft. Several manufacturers use this as the OS for their phones, including Nokia and Samsung. If you are a PC user and you like the interface of Windows 8, then this is the OS for you. All the major e-reading apps are present and are acquired using the Windows Store.

Anyone in the market for a smartphone is strongly advised to fully investigate its available apps, as a device is often only as good as its applications. Make sure it has all the right apps for e-reading, too (Adobe Reader, Nook, Kindle, OverDrive Media Console, etc.). All smartphones offer the pros of being highly mobile and also featuring numerous apps (in particular the ones that support library borrowing), long battery life in most models, Wi-Fi and data plans (uses the cellular signal), as well as their basic function as a portable telephone. On the downside, most devices utilize relatively small screens and keyboards.

### Tablets

Tablets are almost as saturated and widespread in the market as smartphones (some would argue that they are equally or more saturated and widespread) and offer a more laptop-computing experience. Often the hardware in a tablet is many times more powerful than that of a smartphone. There are an equally broad number of makes, models, operating systems, and features similar to the smartphone market.

A bigger device offers increased enjoyment of e-book reading because users are not so strained to see type on the screen—a common complaint of reading on a smartphone. Many reading apps, and the e-books they display, offer various fonts and font sizes too (this is true on tablets, smartphones, e-readers, and computers). Increasing type size tends to be problematic on a smartphone, as the larger the font, the fewer words fit on the screen. Reading on a tablet, however, is by far the most enjoyable experience available due to the harmonious and balanced combination of size, portability, and features. Tablets will offer challenges for librarians similar to those for smartphones discussed above. Tablets deal with things in a similar manner but on a larger, more powerful device with a bigger screen. The computer characteristics of a smartphone are very similar to what users are experiencing on a tablet and so apps are essential.

### BRANDS

Tablets break down into four main flavors: Apple, Android, Windows, and Amazon operating systems. For the most part, all the tablets on the market today utilize and run one of these four operating systems. The Apple tablet is the iPad and comes in three varieties: iPad, iPad with Retina Display, and the iPad Mini.

All three only run the Apple OS (currently iOS7) and feature a few proprietary features—like the iBooks app—as a result. Apple is the leader in the number of apps offered and many are free. iPads range in price from $299 to $929 and have a bounty of features. The most efficient means of viewing the full scope of Apple’s tablet offerings is to consult the company’s website (www.apple.com/ipad/compare).

The Android OS can be found on many tablets across manufacturers. These include, but are not limited to, Samsung’s Galaxy Tab, Google’s Nexus, and Barnes and Noble’s Nook HD/HD+. Windows offers its OS on tablets in two flavors: Window RT and Windows 8. Tablets with this OS have some limitations that are rumored to be solved with the unifying release of Windows 9.

Amazon’s OS is exclusive to the Kindle Fire and is based on the Android OS. As of this writing, the current version is Fire OS 3.0 (codenamed “Mojito”). Amazon has made modifications to its OS to suit its purposes and to drive loyalty. If you enjoy the Amazon experience in general, you will love the OS on the Kindle Fire models. The biggest downside, of course, is that if you go with Amazon you’re limited to only their offerings. For libraries and those looking to borrow content, this is not the end of the world since PDF is supported and Kindle Books are offered by major vendors, including OverDrive.

Kindle Fire is the product line of e-reader tablets that share many features and characteristics of traditional tablets. Amazon currently offers four Fire models: Kindle Fire HD ($139), Kindle Fire HDX ($229), Kindle Fire HD 8.9 ($269), and Kindle Fire HDX 8.9 ($379). Detailed specs can be found at this website: www.amazon.com/gp/product/B00DOPNLJ0/ref=fs_ta#kindle-compare.

Essentially, Kindle Fire is a product that more closely replicates the tablet experience and here again, apps are the reason why. The Kindle Fire lineup also offers several storage size options, ranging from 8 GB to 64 GB, depending on the model. All four Kindle Fire models offer dual band Wi-Fi with optional 4G plans on all but the Kindle Fire HD. The HDX models feature Amazon’s new Mayday button that offers access to an Amazon expert 24/7/365 to help walk you through some features, illustrate how to do something or do the task for you. Librarians will want to give this feature some attention because knowing how to get to this feature will supplement their efforts to help people learn their device.

Last but not least, Barnes & Noble currently offers two tablet-like models: Nook HD ($129) and Nook HD+ ($149). The two tablet models feature full-color HD screens, as well as dual stereo speakers, headphones, and several other bells and whistles.

My advice to any librarian working with e-books who hasn’t yet invested in a tablet: purchase it as soon as you finish reading this article. The ability to read an e-book, then switch over to e-mail, browse the Web, use a camera (for video, too, on some models), word processing, listen to music, watch videos, etc., etc., etc., make the tablet the must-have device. It is, many would argue, the king of the tech jungle and the divide that may just replace laptops in the lives of many. On the plus side, tablets offer computer-like features such as web browsers,
printing, expandable memory, and more capable hardware; apps (in particular the ones that support library borrowing); greater portability in comparison to a laptop with many of the same capabilities; and the best reading interface and experience of any mobile device.

**Dedicated E-readers**

Without a doubt, the last lineup of Kindles and Nooks was the most breathtaking since e-readers first hit the market. While many other brands like Sony, Kobo, and so on have usable devices, Kindle and Nook clearly are the top dogs. Additionally, both Kindle and Nook now have tablet-like models, making them a formidable competitor to iPad and other tablets on the market (which is why they are discussed above in the “Tablets” section). Dedicated e-readers are in essence pseudo-tablet e-readers that capture the ease and functionality of apps. They focus on one main task—reading. For those that want a single-task device, the basic model of any dedicated e-reader should suffice. Online browsing, purchasing through the online store, and playing games will be a bit clunky, particularly on the older and simpler models that don’t offer full features. It is, however, very gratifying that the major e-reader device makers offer devices that do more than just e-reading. The e-reader market essentially is divided into two types of devices at varying price points: the e-reader and the e-reader tablet. This is advantageous, as there are models for any budget, with more bells and whistles added as price increases.

**AMAZON’S KINDLE**

One of the most dominant devices for e-reading is Amazon’s Kindle. All Kindles are built for e-reading at a minimum, and the various models add features above and beyond that to include many other multimedia options like movies, music, and more. Detailed specs are provided beautifully on the Amazon website, but the most notable specification is with regard to the e-book file formats that Kindles support. Obviously, Amazon wants customer loyalty, so the native Kindle file formats (.azw and .kf8) are the main supported file formats for e-reading. PDF also is supported, but EPUB is not.

What does this mean for librarians? Well, if you are helping patrons borrow e-books, this information becomes critical and you must be well-versed in the file formats your facility offers. OverDrive, for example, has many titles featuring several file format options, including those that are exclusive to Kindle. OverDrive has done an amazing job navigating and negotiating the rocky world of e-content to provide end users with a choice. Librarians often will be called upon to help patrons understand which file format they need for their device. In the case of Kindle, it is good to direct them toward Kindle Books (.azw and .kf8) or PDF and away from EPUB. For all other content that they may have the ability to enjoy, based on the device they have purchased, Amazon has provided detailed
information on its website, including specific information regarding all the multimedia file formats that each device will support.

With the exception of possible promotions, the base model Kindle is $69 and uses a five-way button for navigation and controls (no touch interaction on screen). It also has three additional options: the Kindle Paperwhite ($119), the Kindle Paperwhite 3G ($189), and the Kindle DX ($199). The Kindle Paperwhite has a slightly higher resolution, a touch screen, and a backlit screen. The Kindle DX has a much larger unit with a larger screen, with a physical/tangible keyboard, but no touch interaction on screen or backlight. All of the four current models have web browsers that are minimal in function and capability. They do not use apps, per se, and there are some audiobook capabilities. Plus, all four have built in Wi-Fi capability, with the Kindle Paperwhite 3G offering Amazon's free 3G wireless.

Kindle has a lot to offer the reader and has some nice supplements (depending on the model), too, like X-Ray for books and textbooks, Text-to-Speech, MatchBook, sharing with friends via GoodReads, cloud backup, fast page turns, real page numbers, built-in dictionary with instant look-up, custom fonts, resizable text, Whispersync technology, and Immersion Reading.

**BARNES & NOBLE’S NOOK**

The Nook has established a very competitive lineup and, like the Kindle, has at its core a great e-reading experience. The higher-end models offer many of the same multimedia options that one might see on a tablet. Apps are making a greater presence as well and Google Play is featured on the two tablet models (Nook HD and Nook HD+). Like the Kindle, a major consideration to examine is that of the supported file formats for e-reading. Quite opposite to Kindle (naturally as these two top dogs are major competitors), the Nook favors the EPUB and PDF format and will not display Kindle Books. For librarians and their patrons, this means easy borrowing from the library as EPUB and PDF are the most ubiquitous of the file formats with regard to various e-book lending services and platforms.

With the current lineup of Nooks, the base model is called the Nook Simple Touch and costs roughly $79. The lightest model, the Simple Touch uses a paper-like screen, has expandable memory via Micro SD, and great battery life, but does not have a backlight or headphones/speakers. Simple Touch also is offered with GlowLight. That model ($99) has all that the Simple Touch has with the addition of a backlight with brightness adjustment capabilities.

For those wanting a more multimedia-rich device, the next two Nook models are geared to experience audiobooks, movies, apps, Google Play, and more. The Nook HD and Nook HD+ are essentially e-reader tablets (see “Tablets,” above) that share many features and characteristics of traditional tablets. Detailed specs
for all Nook models can be found at this website: www.barnesandnoble.com/u/Compare-NOOKs/379003181.

Thanks to the fantastic price points of these super-lightweight devices, as a public librarian I was able to give many units away for adult summer reading programs, adult book clubs, and as prizes to entice community members to attend enriching programs and workshops at their local public library. It worked, too. Talk about a fantastic carrot at the end of a stick.

One feature commonly overlooked is the backlight. This is a major plus worth every penny. If you read in bed and want to minimize disturbing your significant other, it is a must. I once had a patron come to a workshop I facilitated who brought her Kindle (it had no backlight) and a traditional book light clipped to it. I laughed hysterically and had to lovingly poke fun at her as I remarked how funny it was to see a high-tech e-reader device with a book light on it. In my mind, I instantly conjured up an image of a doctor powering up an MRI machine using a water wheel.

The true e-reader device has one overwhelming pro and one disappointing con. That overwhelming pro is the ability to carry a relatively lightweight device sporting hundreds, if not thousands, of books wherever you go. This is truly reading nirvana as titles mostly are reasonably priced, libraries across the nation lend content, and many classics may be found for free on the Internet. Devices using eInk displays can be read in full sunlight and are perfect for a day at the beach. Battery life on many of these devices is also very strong.

During one of my OverDrive e-reader workshops for a public library, a woman who was one of the attendees was bursting with joy at this “library in your pocket” feature. She related the story of how she and her husband love to travel, and she often would check one piece of luggage at the airport that contained all the books she wanted to read. For any given travel adventure, that piece of luggage was something that neither her nor her husband, wanted to haul around despite its nifty and innovative roller blade-like wheels. Books are heavy and she loved to read hefty 500+-page titles. She quickly became an early adopter of e-readers and should be compensated abundantly by device makers for her contagious zeal and word-of-mouth marketing. What was her favorite feature? Simply put: an entire handpicked library in her jacket pocket on a device that weighed well under a pound.

So, what possibly could be the con on such an amazing device? They are just not as versatile as laptops. I have this same gripe with tablets: I want that sleek, fast, powerful device that is like an iPad and as functional as a laptop. In addition to feeding my hunger for the written word and being able to read a plethora of e-books, magazines, journal articles, and more, I want to be able to retouch photos in the full version of Adobe Photoshop. I want to write the great American novel in a feature-rich word processor like Pages or Word, render movies of my children with all their silly antics, and conquer the undead in World of Warcraft in stunning high def (oh, and get ten-plus hours of battery life at the same time). Is that so much to ask?
When the day comes (and I have no doubt it will) that tablets are the ultimate e-readers and are also as capable as real high-end laptops, this librarian will stop whining . . . temporarily. I want that day to come soon, and I am admittedly content for now as current devices are pretty darn amazing.

All in all, the positives far outweigh the negatives, and right now e-readers offer the very welcomed pros of prices for every budget, apps (in particular the ones that support library borrowing), as well as being lightweight and quite portable while capable of holding an impressive amount of content with optional capacities based on model. Some have expandable memory and cloud storage as well. The lone detriment is the power and speed of some (particularly earlier models).

Laptops and Netbooks

The laptop and netbook are here to stay for a few years more for one critical reason that I have already alluded to. All the other devices are just not as powerful, fast, or functional . . . yet. They will be, as I have peered into my crystal ball and seen it. I am sure that many of us still find ourselves hauling around a laptop or netbook despite the annoyance of getting one onto an airplane. To get serious work done, they are a necessity and we love them for that. They do have a great deal to offer the e-reader, too, with software like Adobe Digital Editions, apps, and a host of online resources. Of course, having a fully functional web browser is nice, too, as many of us use these to their full potential to access the bounty of the Web. Many libraries check them out as well as the computer itself, and many software packages are expensive and out of the reach of many students or other library patrons. Having any of the devices discussed in this article is a gigantic plus for any library and its patrons. If you need to bring more people to your library, this is the way to do it, and I recommend it over any other tactic (with the exception of providing free Wi-Fi).

My advice: own and use a laptop for serious work and another device for the ease of use and portability factors. Many of your library patrons will potentially own both and will want help with both. You can read on both, but it is far more pleasant on the latter. I am quite biased here as I love the MAC, but it really all comes down to your budget and what you want to do with your laptop or netbook. The good thing is that there are many choices out there for any budget and they all offer an e-reading option or two. In many cases, like with the vendor ebrary, your best tool is the browser. Ebrary, for example, has one of the nicest e-reading interfaces in the business with everything done right in the browser, if you so choose. This is of particular importance for librarians helping people who are novices in the e-content world. If they are acclimated to a computer, the next best place to take them is to a browser-based e-reading experience using ebrary or OverDrive Read. Once that becomes more comfortable, librarians can then guide patrons to the other devices.
Laptops and netbooks offer the advantages of being more powerful and feature-rich and containing larger software options, apps (in particular the ones that support library borrowing), and peripherals support (i.e., printers, projectors, monitors, external hard drives, USB, etc.). One downside is that they are comparatively less portable (heavier and more cumbersome), require more power, and are generally more expensive.

Conclusion

We live in an age when technology has never been so much fun and in the hands of so many users. When one considers how much has been invented, discovered, or advanced in the last couple of decades alone, compared to the long history of the world, one can appreciate the amazing world we live in. E-reading is one aspect of this great technology age we enjoy. So get a device—any device—and make the most of it.

Pros and Cons of E-reading Devices

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<th>Device</th>
<th>Pros</th>
<th>Cons</th>
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<tr>
<td>Smartphones</td>
<td>many options and choices, highly mobile, long battery life, Wi-Fi and data plans, built-in phone</td>
<td>small screen and keyboard</td>
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<tr>
<td>Tablets</td>
<td>computer-like features, portability, best reading interface, expandable memory, more capable hardware, apps (particularly those that support library browsing)</td>
<td>not as powerful and capable as laptops for professional work</td>
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<tr>
<td>Dedicated E-Readers</td>
<td>lightweight, portability, ability to hold many e-books, affordable price</td>
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<td>Laptops/Netbooks</td>
<td>more powerful, feature-rich, fast, web capability, functionality, software, peripherals support (e.g., printers, monitors, USB, etc.)</td>
<td>less portable than tablets, more expensive</td>
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ABOUT THE AUTHOR

John Burns has worked for both public and academic libraries. Formerly head of reference, IT manager, and adult services librarian at the Watertown Public Library in Watertown, Wisconsin, John is now assistant professor and reference and instruction librarian at Dixie State University in southern Utah. Throughout his career, John has worked with and developed continuing education courses (online, on campus, and in libraries), fostered technology, taught multiple topics, including information literacy, developed programming for adults and students, coordinated efficient staff workflow, implemented best practice for cataloging materials, and implemented training resources for library patronage and staff.
Two school librarians take Rosen Publishing’s educational e-resource for a test drive

**Navigating Rosen Publishing’s** 2014 catalog of digital content may at first seem a bit overwhelming: it impresses both as a vibrant presentation of the company’s wide array of digital offerings but it also reminds us of just how “digital” K–12 publishing has become. Or at the very least, it makes those of us still tempted to think of Rosen as merely a “publisher” realize it has now transformed into a multifaceted media company.

Perhaps more than any other independent publisher of K–12 resources on the market today, Rosen has become synonymous with high-quality, always-in-demand, constantly evolving interactive content. It has also become synonymous with digital learning solutions, produced to be fully aligned with state, national, STEM, and Common Core standards. Indeed, taking a closer look at Rosen’s offerings today, it’s clear that despite the versatility of its content, Rosen has become a passionate advocate of STEM learning. And they’ve been releasing products to prove it, too.

These still include books, of course, available in print and electronic formats, but Rosen’s big bets these days are the interactive e-book (laden with multimedia enhancements and various embedded tools to support student learning), online databases (e.g., Teen Health & Wellness; Financial Literacy), and “suites” of products designed to promote STEM education and digital literacy in the United States.
In this issue of *eContent Quarterly*, we focus on one resource in Rosen’s Core Concepts suite, Core Concepts: Periodic Table (CCPT), which launched in 2013 and was followed with the early 2014 release of the second product in the suite, Core Concepts: Biology. We chose to focus on CCPT because the sheer complexity of the subject—the understanding of the 118 elements that make up our world—begged the question: how does a publisher (or producer of digital content) embrace a topic that requires so much hands-on exploration and take full advantage of all that technology has to offer in order to deliver a product that both educates, engages, and even entertains?

Rosen emphasizes the following about CCPT on the product’s main [website](http://www.coreconcepts.com):

- Correlated to Next Generation Science Standards and Common Core standards as well as national, state, and provincial science standards
- Articles enhanced with student-created video from Chemical Heritage Foundation
- Professional footage, extensive images, diagrams, and data tables provide an understanding of the elements, from the atomic level to the cosmic
- Interactive “Element Builder” activities reinforce skills and core ideas, allowing students to explore atomic theory and master the science behind the periodic table
- Interactive tools, courtesy of the Open University, help students explore the role of elements in the human body, the environment, and the universe
- Content creation activities encourage students to apply knowledge
• Instant translation offers articles in over fifty languages
• Text-to-speech and text highlighting to support challenged readers and English language learners
• Social bookmarking allows users to share content
• Digital flashcards and printable reference guides strengthen learning
• Lesson plans and instructional materials provide road maps for exploring the science behind the elements
• iPad, iPhone, iPod Touch, and Android compatibility

We invited two school librarians to take the product for a test drive and offer thoughts on these and other features. We also asked them to reach out to chemistry teachers at their institutions to further comment on using the product in a classroom setting. Catherine Leininger's review focuses on CCPT's various bells and whistles and serves as a good introduction to the product. It also incorporates some background information on chemistry standards in the United States and explains how the product is aligned with them. Diane Dillon's review, while also exploring the features, delves deeper into the product's pros and cons in the context of what else is available online. It also incorporates the perspective of a chemistry teacher reacting to some of the more helpful features the product has to offer to students and educators. Taken together, these two reviews, along with their accompanying commentaries, answer most, if not all, of the questions that may come up as librarians ponder whether the Core Concepts suite meets the needs of their institutions and warrants a purchase.—Ed.

Core Concepts Periodic Table

by Catherine Leininger

REMEMBER WHEN WE were shipped the CD with the Oregon Trail on it or The Encyclopedia of Animals? We popped the CD into our computers and the exploration was on! Learning happened by playing and following the story and coming out at the other end, having learned a lot without seeming to have worked at it. With all the recent excitement of putting content on the Internet, whether excellent or not, and the rush to digitize textbooks, the creation of true learning and teaching software has taken a back seat to simply displaying content.

Rosendigital.com has made a great comeback for teaching software with their Digital Resources & Common Core Support for 21st Century Learners. This suite offers Life Skills Tools including Teen Health; Digital and Financial Literacy; Power Knowledge Science Suite; Interactive E-Books; Character Strength; and Ancient Civilizations. The final product—Core Concepts Periodic Table—is useful for both students and teachers because it conveys chemistry information with interactivity and multimedia that students can comprehend and enjoy.
Starting with a beautifully colorful and graphically clean presentation of the periodic table of elements, the splash screen is the hub for navigation of this product. Hover over an element symbol square and the software presents the atomic weight, electron configuration, state of matter, and whether the element is formed naturally or not. Element groups are color coded and listed along the bottom as well as in the chart. Click on the element or element group and you are taken to All About the element or group which gives you an overview, a video, and several Rosen content articles—some short and some long. (See figure 1.)

The All About element articles are divided into subjects which are listed on the left side so you can jump around. They all include graphics or pictures or videos. They have a link to Resources, Glossaries, and For Further Reading, including citations back to sources. The articles are well written at a 6–12-grade reading level, so they are not too difficult. They include links to other articles, other elements, groups, and vocabulary words. Essentially the articles create an online textbook, but the linkages make it interactive and very student-friendly. As a chemistry teacher says, “This has all the material from my digital text, but in a much better format.”

The five tabs at the top of the product take you to other areas for students and teachers. Browse A–Z navigates you to an alphabetic listing of the elements and groups, which in turn takes you to the All About page for the element or group. The third tab, More About the Periodic Table, has just the groups and Mendeleev, the inventor of the periodic table, listed so that you can jump to their All About page.
Under the second tab, Element Builder is at the heart of the product’s interactivity. (See figure 2.) Start with the tutorial that begins with the hydrogen atom—1 proton and 1 electron and lets the student add or subtract either one to see what happens! No chemicals or explosions necessary! And they sneak in some information about ions, isotopes, instability, and radioactivity along the way. The sound is a little Johnny Bravo, but luckily can be turned off! At the end of the tutorial you can earn a badge or take a quiz.

From this point in the Element Builder a student can take other challenges. Unfortunately, the student has to progress through the challenges sequentially once they have entered the tutorials. The program does save your spot and allow you to reenter where you left off rather than start over. If a student would rather try Free Build, they need to enter the Element Builder using that button or come from one of the element pages. There are no help or hints when you enter this way, so it is a challenge to make new elements and isotopes. At the end, you can access a list of all the student achievements and badges as a way to see what progress has been made.

The third tab on the splash page is Explore, Create, Learn. The first choice takes you out of the product to The Open University—always a risky move—but the material is interesting and shows the practical application of elements in the earth, the body, and within “everyday stuff.” Resources to help students put together a multimedia presentation, a podcast, or a video are on this page. But the third choice, Explore the Video Gallery, was my favorite spot. These videos are also included on the All About element pages. Using brief professional- and student-created videos, you can gain a snapshot about the element or group of elements very quickly and with something memorable to help you retain the information. Periodic table flashcards include the basic elements with numbers,
weight, state, and a picture of the atom for class or group review. A link to Element Builder completes this area.

What a lot of choices a teacher has! Each student can be assigned an element to research or make a project video about; groups can work collaboratively on element groups for an interactive multimedia presentation; through the interactive Element Builder students can explore element ions and isotopes; or teachers can use one of the prepared lesson plans under the Resources for Teachers and Librarians tab to lead them through a class assignment.

The product provides two lesson plans with supporting graphic organizers. The first lesson introduces atoms and their structure and how adding or subtracting parts of these elements changes the element. One of the activities is a card game where you choose the action and the team has to guess the result. The second lesson introduces the organization of the periodic table and the activity has groups constructing their own model using their understanding of how the elements relate to each other.

Both lessons use and reference the Rosen Core Concepts Periodic Table to learn, practice, and to find answers to questions. Many more lesson plans could be developed, but the two provided support the first three to five days of teaching the periodic table in an interactive, multifaceted way that should be interesting to students and allow them some hands-on time as well.

Also available in the Resources for Teachers are Curriculum Correlations, which suggest elements associated with your state’s standards and point you to the All About element or group page. Under Reference Guide, you will find a

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**CHEMISTRY STANDARDS BEGIN** in sixth grade, within the Physical Science: Matter and Motion topic when the concept that “all matter is made up of small particles called atoms” is taught and the ninety naturally occurring elements are identified. The concept of compounds—elements joined together—is also introduced. Seventh and eighth-grade standards build on these concepts with the introduction of the difference between pure substances and mixtures and the differences between acids and bases. The idea of element groups—metal, nonmetal, and nonreactive gases—becomes important with their properties and position on the periodic table emphasized. Using Rosen’s Core Concepts Periodic Table, these concepts are easily shown and taught in a colorful and hands-on manner that middle school students will like.

Chemistry becomes its own course of study with a two-semester syllabus in the high school standards. CCPT can be very useful as either an introduction or a review of concepts taught in sixth, seventh, and eighth grades—atoms, molecules, and compounds. These initial concepts are expanded in the high school standards to include the parts of the atom—protons, neutrons, and electrons as well as the relationships between what makes up an element and its position on the periodic table. The Element Builder, with its hands-on interactivity, would be very helpful to students and introduce them to the next step of ionic, covalent, and metallic bonding between elements.

Further reading on each of these topics is provided in the All About pages, including background on the evolution of atomic models and theory. The lesson plan Introducing the Atom includes these requirements. General scientific process and scientific inquiry requirements are also addressed throughout. Of course, Reading and Writing for Information ELA (English Language Arts) standards and students’ ability to integrate technical information expressed in words and via diagrams, flow charts, or multimedia is an integrated part of this product. —Catherine Leininger
full-color printable Periodic Table of Elements with the key to atomic number, atomic weight, element symbol, and element name.

Resources for the librarians include materials to promote and manage the product to students and teachers, including a Customer Newsletter, Online Training (a short PowerPoint presentation), User Guide, Usage Statistics, and Promotional Materials section (bookmarks and posters). They also provide a Web Button which you can put on your school’s digital resources page.

Carol Noffsinger, chemistry instructor at Upper Valley Career Center, offered some thoughts about the product for the purposes of this review. She said that 60 percent of the chemistry she teaches is dependent on the periodic table, adding that “to be able to give students a tool such as CCPT, which is a consistent model, available at school or at home, for them to be able to see it and point to it and interact with it—that consistency is invaluable.” The analogy she draws is that the periodic table is to chemistry as a calculator is to math; you can work the problems through without it, but the tools make the learning much easier.

Indeed, CCPT turns chemistry, which can be inaccessible for the novice, into something interesting and interactive. I ended up with lots of questions and wanted to start mixing elements from different parts of the table. I also was led to watch more videos and read more information about the more obscure elements to see how they fit in. Hopefully your students and teachers will, too.

ABOUT THE AUTHOR

Catherine Leininger has been a school librarian at Upper Valley Career Center, Piqua, Ohio, for fifteen years and before that worked as a software engineer and a product and project manager at LEXISNEXIS in Dayton, Ohio. She has served on the OELMA (Ohio Educational Library Media Association) Board and the INFOhio Governing Board for statewide digital resources. She especially appreciates the high school students she works with at a career center and their need for instructional materials that are hands-on and interactive.

Core Concepts
Periodic Table
by Diane Dillon

SITTING DOWN TO review Rosen Digital’s new online product, Core Concepts Periodic Table (CCPT), was no easy feat this holiday season, having to compete as it did against a backdrop of traveling and feasting, shopping and celebrating, bowl games and board games that are the hallmarks of America’s almost 400-year old holiday, Thanksgiving. The clean, inviting, and clutter-free home page of Core Concepts Periodic Table won me over, as it will your students. It is colorful, has just the right amount of organizational links, and is easy to navigate. Students don’t always focus on authority, but Rosen Publishing’s track record helps teachers and librarians rest assured that the content is appropriate for the K–12 market.
As we all know well, today’s students are unintimidated by bells, whistles, links, tabs, and the like, but I prefer the advertising-free modus operandi of a database like this one. I also like Rosen’s attractive, easily accessible points of entry into their thorough and reliable product. Learning about the periodic table and accessing information about groupings of elements and their properties via an interactive tool is a match made in heaven. A database allowing multiple users to browse it, no lost volumes worries, and 24/7 everywhere access add value to the research process and the development of information literacy skills, trumping other considerations for tighter-than-ever budget dollars.

Users will first want to take in the organization of the database, beginning with the four student links on the top navigation bar. Clicking on the first, Browse A-Z, reveals an interactive topic index to not only the 118 elements, but also important scientists, scientific processes, and a myriad of articles relating to better knowledge and understanding of the elements and their role in the sciences and day-to-day living. Examples of related topics include absolute zero, iodine deficiency, and semiconductor. The results list displays the part of the sentence where a user’s search term first appears and once a student selects a link to follow, the search term is highlighted throughout the article. The Browse A-Z link is thorough and user-friendly but it is not a true index. A user searching for an explanation of an ion, for example, is better served by the omnipresent and highly visible query box.

The second link takes one to Element Builder, an interactive instructional animation teaching atomic numbers, atomic weight, ions, isotopes, and stability. Each element-building activity is followed by a short interactive quiz. I enjoyed altering proton, neutron, and electron numbers, changing one element into another and taking the quizlets. The instruction, however, is overly simplistic and students may stumble on a different isotope than the one intended. Allowing more flexibility in the design and a heads-up about possible isotopes would allay misconceptions that might develop. Students may be thrown by why the element xenon did not form an isotope, following the directions and the hint. This activity would work well as an instructional tool with chemistry teachers explaining the varying results.

The next link, Explore, Create, Learn, takes one to The Open University, an institute of higher education located in the United Kingdom. The app includes superb videos and interactives such as “Elements That Changed the Course of History,” “Body Chemistry,” and “Elements of the World.” This link also includes making podcasts, videos, and multimedia presentation jumpstarts and two sets of flashcards. It is, however, The Open University content that has the potential to engage even the most reluctant student scientist with the marvels of the elements.

The final student link takes users into the descriptions and properties of element groups, illustrating that the peculiar shape of the periodic table was developed by grouping the elements based on shared properties. Like the links to the elements themselves, these topics include a series of specific articles including a
topic-specific glossary, links to external organizations and agencies, as well as a bit of a recommended reading list.

Getting back to the periodic table itself, the “meat and potatoes” of this product are the interactive links to the elements and the color-coded periods and groups comprised of elements sharing important properties. Users are a click away from significant articles and accessible, informative opportunities for learning. Hovering the cursor over an element reveals its basic properties, while clicking on the element takes one to a list of resources. It is this series of articles that makes CCPT more valuable than many free periodic table databases on the Web. The basic article includes a graphic of the element, introductory information, and often, a short (usually under thirty seconds) video or a longer award-winning, student-produced video. Other resources include the discovery and history of the element, and its role in the sciences, the environment, and in the human body. The element silver, for example, includes articles about the discovery of silver, its properties, compounds, and uses that are sprinkled with images, graphics, and video clips.

In spite of some very appealing features, CCPT is not without shortcomings. The student-produced videos should have been an option to video content on the site, but were instead, aside from very brief video clips, the only video content on the site. While they are award-winning student videos, the quality is uneven and the instructional value is sometimes unclear. Also, while there are the Element Builder interactive and quizzes, there was little in the way of additional animations or hands-on learning activities. Another drawback to the database is that not all elements are developed as thoroughly as they might be. Tungsten, for example, has no additional articles beyond the base article and is without glossary or links to other agencies or recommended reading suggestions. A quick Google search locates the U.S. Geological Survey article on tungsten and includes a link to the International Tungsten Industry Association. While the tungsten student-produced video is well done and informative, it is the only access point for additional details about the element.

Most of the elements have a resource list that takes the user outside of the Rosen product. Sometimes these links are valuable explorations of related content and other times, too often, they are dead ends, taking you to a site’s home page rather than to direct links where recommended information is readily located. Using the recommended site’s search box yields an extensive list of articles, but often in random keyword fashion rather than a subject-access way. Students may puzzle over which link provides a valuable extension to the information already included in Rosen’s database. These resources and websites are, in many cases, great links, but the onus falls on the user to mine the site for relevant gems of information and wade through a results list, an often daunting task more suited to accomplished researchers. I found great information on oxygen on the NASA site but had mixed results on some of my other searches. Better to pick one or two outstanding links and cite them directly than take users to agency home pages. The option remains for students to use the site’s query box to initiate additional content searches. Also, the further reading list is uninspired, for
Reviews: Core Concepts Periodic Table

example, directing readers to a book on rocks and minerals rather than any number of specific books on the element in question.

There are many free Internet sites introducing the periodic table, and these range from rather elementary ones, such as the authoritative Annenberg’s Learner.org site, to more advanced sites such as the Royal Society of Chemistry or the Los Alamos National Library interactive periodic table sites. Some are awash in animations and hands-on activities, while others include many quality videos. The Scientific American site (www.scientificamerican.com/article.cfm?id=chemistry-the-elements-revealed-interactive-periodic-table) includes a fun fact for every element, such as the tungsten fun fact: this element has the highest melting point of all elements, at 6,170 degrees Fahrenheit (3,410 degrees Celsius), and is the heaviest element to be used by living organisms. It is one of the few elements that commonly go under two names, the other one being wolfram—hence the W symbol. The Periodic Table of Comic Books is entertaining, if somewhat less instructional.

Bottom line: Rosen Digital’s Core Concepts Periodic Table has much to recommend it. A feature I did not mention yet is that the last link on the top navigation bar links to resources for teachers and librarians, including teaching tips and lesson plans. Each of the numerous articles is cited in MLA style and APA style. A periodic trends link reveals the overall organization of periods and groups.

In conclusion, Rosen Digital has created an ideal database for young researchers, particularly because of its abundant, lengthy articles rather than property listing. Students around the country explore an element in detail, just the kind of authoritative, accurate detail they will find here. The amount of text beyond the property stats and the clean, uncluttered ease of access are the elements that place Core Concepts Periodic Table at the head of the pack.

ABOUT THE AUTHOR
Diane Dillon is a retired school librarian and library coordinator who spent the bulk of her career as a high school librarian in the Nordonia Hills City School District, introducing digital access to teachers and students and moving them to quality resources, authoritative articles, and databases that demanded the development of critical thinking skills. She also simultaneously worked as a Know It Now Librarian (24/7 online reference service) for around seven years in Ohio. Today, she researches and writes for a growing educational publishing house, Bright Ideas Press (BIP), in Beachwood, Ohio. BIP publishes consumable materials for the K-8 market, including workbooks addressing math and language arts common core standards.

A Teacher’s Feedback

REBECCA TOUKONEN, a chemistry teacher who recently left teaching at Nor-donia High School to become an editor at educational publishing company Bright Ideas Press, offers the following feedback on CCPT:

• families are colorfully displayed
• description of each family can be accessed without leaving the table; this makes the product compatible as a teaching aid on a smart board
• abundant information about each element is readily available and could be used to have students research information comparing elements within a certain family or contrasting metals with nonmetals
• the overlay of arrows illustrating the periodic trends is very helpful for introducing the trends, although it should be noted that only the general trend is illustrated, making the product more appropriate for lower-level chemistry classes
• the tutorial that comes with the element builder may mislead students about the relationship between protons and neutrons; however, a free build feature visually demonstrates that changing the number of protons changes the identity of the element; if properly used, this feature could reinforce that protons and neutrons are not always equal and that while the number of protons cannot change for any given element, the number of neutrons can
• the electron portion is a bit deficient; it will allow you to add electrons and it will tell you if the corresponding element has a positive or negative charge, but it does not indicate the quantity of the charge (i.e., two extra electrons means –2 charge).