The Evolution of Card Catalogs in a Public Library Setting.

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SLIS:5042:001

Public libraries use the latest technology in order to enhance user experiences, especially within the library catalog. Technology increases the accessibility of card catalogs, and each method of technology provides new modes of access. At the turn of the twentieth century, librarians switched from handwritten cards to typewritten cards, for the sake of clarity and legibility. By the 1960s, when card catalogs were printed on microfilm, libraries prioritized speed and efficiency. In the 1990s, public library websites began providing their catalogs online in order to help patrons better navigate the library's collection on their personal computers, learn how to find resources independently, and access the catalog from any internet connection. Once libraries adopted online catalogs in the 2000s, ebooks and open public access catalogs became factors for catalog accessibility as well. For example, present-day Eastern Iowa public libraries display their catalogs in varied ways so that their specific communities may easily access them. Clarity and consistency are of the utmost importance throughout history, when it comes to the library's purpose of accessibility in their catalogs.

Providing consistent services in catalogs was fairly new in the early 1900s. Librarians had previously been handwriting their cards, but with the invention of the typewriter, they transitioned to typing their cards. Because each typewriter had a distinct style, librarians talked amongst themselves through the librarian magazine *Library Journal*, to debate which typewriter provided the best results. The column "Typewriters in Libraries" featured a series of short essays, written month to month during the spring of 1900, discussing the use of typewriters in libraries. In the March essay, Willis Stetson of the New Haven Public Library raised the question of whether card catalogs should be written on typewriters or not, and if so, which typewriter works best. The second essay, written in April by F. M. Crunden from the St. Louis Public Library, responded by relaying their experiments with the Hammond brand and the Remington brand. Crunden concluded that the Remington was the best for printing cards. The essay written in May by Minnie Oakley passed on years of wisdom, for her business at the Wisconsin State Historical Library in Madison has been experimenting on this topic for years. Wisconsin State was looking for strong type bars and a clear cut impression. They too decided on the Remington, though both the Smith-Premier and Densmore were close seconds. "Our typewritten card catalog has given so much satisfaction on account of its legibility and uniformity, together with the economy of time in its preparation that we would not willingly return to pen-written cards,"

Oakley concluded. Finally, the essay from June written by E. P. Van Duzee at the Grosvenor Library defended the ribbon-less Williams typewriter. However, they used the Smith-Premier typewriter for the Medical Department because it is a lot neater than the Williams.

Three main technologies are examined here: the various brands of typewriter, the method of putting information on a card in a card catalog, and the action of writing to a monthly magazine. It is notable that many different libraries weighed in on this subject, to compare and contrast ideas from throughout the country. Of course, it was not as instantaneous as Twitter, but the fact that people were swapping ideas with strangers in a virtual public forum, even at the turn of the century, was remarkable. As for choosing the typewriter brand, it seemed to all comes down to priorities. Some of the libraries wanted a card catalog that looked neat, some just wanted consistency amongst the cards, some favored legibility the most, and some just wanted a typewriter without a ribbon. All of these librarians agreed that they could not consistently produce a neat, legible card when writing by hand. Even though changes in the library often prompt some hesitance from the librarians, few librarians offered much resistance to making the change to typewritten cards. In later issues of *Library Journal*, ads for the Remington typewriter began popping up, so that seemed to be the librarian's top choice,(or the company with the biggest advertising budget and a smart marketing team).

Marketing ads for microfilm soon joined the ads for typewriters. Microfilm was first used during World War II because it could retain and protect information very well. It continued to be useful to librarians when they found that the materials on their shelves were getting damaged easily. The reels of microfilm cut preservation costs too. However, there was a negative side-effect of microfilm use in the library. The viewing equipment was expensive and only one person could use it at a time. This was acceptable for patrons who wanted to read old newsprint or access local history, but if librarians had to look through microfilm viewing equipment to simply see the card catalog, retrieval was near impossible. Some solutions included using microfiche (a sheet of film that splices different pieces of microfilm together to get more content on one page) or aperture cards, which were mostly used for engineering. In the 1966 article "Microfilm Uses and Products for Libraries," Richard Laud proposed the solution of using an aperture card containing microfilm images, a technique adopted by the Department of Defense. Laud then discussed how some libraries have been using microfilm to duplicate their cards for easier printing. Laud recommended sending the cards that need to be copied to his business, General

Microfilm Company, where they could be copied for cheap. The Library of Congress, who had already been using microfilm in preservation efforts, had special sized cards at General Microfilm Company and Laud recommended that librarians should get that size for the sake of consistency. The chief librarian of the Boston Public Library, John M. Carroll, was the person who came up with this system.

Though this technique might have worked for Carroll's library, it did not work for all libraries. Richard Laud was the president of the General Microfilm Company in Cambridge Massachusetts, so it was clear that he was writing to describe different scenarios in which librarians could use microfilm in their daily practice from a business perspective. Librarians liked using microfilm to preserve historical information and documents at the public library, but Laud's argument that microfilm would outlive books did not seem to be a consistent sentiment. In the article, Laud even talked about how patrons caused damage to the microfilm. How was this a better preservation technique than print on cardstock? Card catalogs going beyond typewriters was an idea ahead of its time. It was true that duplicating cards was much quicker than copying by hand. However, Laud's idea was to ship the cards to his business, so that they could duplicate the cards for the libraries. This was not a practical method in a busy public library, unless libraries wanted a lot of cards at once and could wait a few days for the duplication process to finish. Typewriters were still being used to type card catalogs and though library professionals were looking for a faster way to type their cards in order to save time, they did not universally settle on a faster method until the invention of the personal computer.

By the end of the 1990s, personal computers were being used in so many ways for the public library. According to Roy Tennant's *Library Journal* article from 1999, "User Interface Design: Some Guiding Principles," the only technological change in libraries for the past century were changing from handwritten card catalogs to typewritten card catalogs. Catalogs and methods of search and retrieval varied from library to library, but by the late nineties, most of them were completely digitized. Technical services staff were prepared to constantly edit the catalog and the website, updating as technology changed and as the library learned what worked and what did not. The guiding principles that Tennant gives are: elements must have a purpose, be consistent, be efficient, support multiple users and communicate with them, ask for help when needed, choose labels wisely, keep it simple, and make changes when needed. He recommended

looking at other websites for inspiration, and praised the Multnomah County Library website for their straightforward layout and pleasing color scheme. He also described University of California as an example of a site that presented a lot of information but did not leave the user feeling overwhelmed.

Tennant's guiding principles for librarians were useful, but some of them seem like common sense. Having a clear user interface meant easier navigation, which is what librarians wanted, even back in 1900 when they were still using a typewriter. All libraries wanted to provide accessibility to their resources, and libraries could not provide this support if users could not navigate through their catalog. Perhaps technical services staff were not hired based on their extensive knowledge of web design, and that people with almost no experience designing were left with the task of designing their library's website. It seemed like some of Tennant's guiding principles fit into each other as well. For example, the principle "keep it simple" seemed to fit with both "efficiency" and "consistency." When Tennant talked about user interface design, he meant the relationship between practicality and appearance. It was interesting to see that elements and labels have their own guiding principles. In this article, labels were defined in reference to user groups within the catalog, like "young adult" or "nonfiction." Elements referred more to graphics and tabs, like icons and photos that could clutter up a home screen. Tennant's statement about how the only technological change in libraries in the past century was the move from handwritten to typewritten catalog cards seems like a generalization and false. As seen in Richard Laud's article referenced above, libraries have tried numerous methods to better organize and print their catalog in order for easy information retrieval. The experimentation with technological changes in computerized catalog organization had a large impact on public libraries.

The computerized card catalog may not only appeal to those in search of information. In 1994, author Nicholson Baker published an article about irreplaceable library card catalogs in *The New Yorker*, focusing on how printed card catalogs lose the endearing notations of individual cards written by librarians. While librarians might have prioritized efficiency in cataloguing over quaint handiwork, Baker was correct in that online catalogs do not provide the same charming aesthetic that a handwritten card might have provided. In his 2006 article "Baker's Smudges," author Stanley Wilder investigated how online catalogs may retain the notations and fingerprints of card catalogs past. The indicators of use that was once ink blotches

is now recognized in Amazon's "customers who bought this book also bought" feature. But how was this recognized on library websites or integrated library systems (ILS) specifically? One example was University of Rochester's extensible Catalog (XC) project, in which the open source catalog used MARC records and showed relationships amongst other resources with similar MARC records. It also incorporated user feedback into the design as well. Even more in tune with the old-school charm was Ann Arbor District Library's online catalog, which featured links to images of their old catalog cards, complete with notations and wear. Online users could also edit and add their own annotations to the virtual card.

Virtual catalogs did provide greater consistency and legibility in their information, yet Baker was correct. The aesthetic of the card catalogs had been lost as technology shifted. The Ann Arbor District Library's idea of preserving the card catalogs on the actual digital catalog alongside the digitized information of the resources not only preserved charm but preserved history. However, as years go on and librarians weed items out of their collections, most resources might not have a "card" to go along with their digital information. Also, the cards listed on the website were typewritten cards with handwritten notations. Handwritten cards were not even represented and therefore, most likely, lost. That is why catalogs that allowed for user feedback and collaboration, like the eXtensible Catalog (XC) project, was the closest thing to a notation on a handwritten card catalog during the early 2000s.

By 2010, the online catalog had quickly adapted and integrated into the culture of the library. ILSs were used as the core business management processor, which could display catalogs and other website materials to both staff and patrons. ILSs were different from catalogs themselves. The ILS created a template through which the catalog could be accessed online. Most of the catalogs available through an ILS were open public access catalogs (OPAC), for their uniformity was professional and standard. However, the emergence of discovery layers, a new software component, had become the style. Discovery layers allowed users to search for information in a way that mimicked keyword searches, the searching style used most frequently on the internet. In the "Taking Issues" column in *Reference & Users Service Quarterly* (2014), Rory Litwin and Dianne Cmor debated the question "Should We Retire the Catalog?" Cmor argued that using both OPACs and discovery layers were a waste of money and that public libraries should be able to choose only one option. Litwin argued that the OPAC provided reliable services for those who wish to use advanced search settings. The two authors agreed on a

few points. They both said that when deciding which catalog system to use, the librarian must ask the question, "who is the user?" Both authors also agreed that there has to be serious modifications to both the OPAC and the discovery layer. For instance, patrons often use advanced searches (a component of OPACs) improperly. Even though the functions are being used improperly, the OPAC must account for this specific type of usage. They both agreed that the OPAC was good for research libraries, reference librarians, or other instances in which the terms may be highly specialized.

Litwin, an academic librarian himself, seemed biased towards specialized researchers and academic libraries, though he made valid points. Just because people were used to casually searching on Google does not mean that they were not smart enough to use a more advanced search engine offered by an OPAC. Cmor acknowledged that discovery systems have issues they must work out, such as options for precision searching, or better relationships between vendors. However, she had a good argument when she stated that discovery layers appealed to those who use keyword searching, which is everyone who uses Google. Therefore, discovery layers (in theory) could serve a large amount of people rather than just an elite few. Both authors were trying to appease their users. While Litwin was thinking specifically, Cmor was thinking generally and financially. This showed that there are several tactics when planning to purchase a cataloging system, and that librarians must think of their specific community or make it universally acceptable to all.

Finding the perfect cataloging system for the materials in your library is one thing, and finding the right system for your ebooks and audiobooks is another. In the *Library Journal* article "First Read*"* by Matt Enis, the New York Public Library created the ReadersFirst coalition in 2012. ReadersFirst worked specifically with ebook catalog systems to advocate for accessibility. By 2012, more than 300 public library systems were participating across North America. One of their projects was to test out and rate ebook systems for accessibility. The top three ebook catalogs (Overdrive, 3M, and Baker & Taylor) were scored and rated out of a possible 100 points. Overdrive received an 85, 3M received an 84, and Baker & Taylor received an 80. Overdrive and 3M scored well because they have application programming interfaces (API), which allows for the user to discover ebooks without navigating away from the library's OPAC. Users responded very intensely that easy navigation was highly important to their library ebook catalog experience. Enis concluded by saying that OPAC and ebook catalog integration

was becoming more and more possible with advanced technology, especially since OPACs like Polaris are partnering with ebook catalogs like 3M. Because of ReadersFirst's size and scope, this coalition could be the people to persuade *all* ebook catalogs to create APIs for their system in order to integrate OPACs and ebook catalogs.

Overdrive and 3M ranked higher in the ReadersFirst user accessibility survey because they had APIs, which allowed them to link to specific OPACs. However, 3M can only be linked to the Polaris (OPAC), which is limiting to public libraries who may already use an OPAC other than Polaris. Therefore, Overdrive was the front-runner in both user accessibility (scoring an 85/100 by the ReadersFirst coalition) and versatility in pairing with existing OPACs. Just like the transition from handwritten cards to a typewritten cards, taking a moment to adjust to a separate cataloging method required a coalition of people coming together to demand accessibility, consistency, and standards in ebook catalogs across North American public libraries. ReadersFirst was formed not by writing into a magazine every week like the "Typewriters in Libraries" column from the early 1900s, but this coalition crystallized from connections on the internet. Ebooks were still fairly new in 2012. Perhaps they were too new to predict if they were going to be a new addition to the catalog or a threat to libraries as a whole. Public libraries believed that by integrating their catalogs, they were really integrating ebooks into the wide range of the resources that the public library has to offer.

Online library catalogs must offer much more than ebooks in order to serve everyone who wants to use the library. In 2016, *American Libraries* published an article by Meredith Farkas titled "Accessibility Matters," which discussed providing online library service to users who have disabilities. In this article, Farkas discussed different ways web designers create a catalog to help those who have a disability. Making the website accessible to screen readers, a software application that converts words into speech, was one approach. Captioning videos was another approach. According to Farkas, in the mid 2000s, library online catalog design was controlled by a small number of people who did not factor in users who may have a disability. Farkas argued that we now have the technology to help those users. She advocated for libraries to team up with community organizations who represent Disabilities Services before purchasing a new software or program for the library website. The community organization can then test the system to see if it is accessible or not, before the library purchases it. Farkas also stated that libraries may think that they do not have a choice when they purchase already-created ILSs and

OPACs from vendors, but that is not true. Libraries can refuse to buy from vendors because of their lack of accommodation to people with disabilities. However, that method does not work until more libraries follow suit. "Accessibility isn't just a nice thing to do," Farkas stated, "it's the law."

Farkas is right: it is a legal requirement for libraries to comply with the Americans with Disabilities Act (ADA). Therefore, accessibility should be framed in library rhetoric not as a "value" but as a mandatory requirement. Farkas wrote mostly about users who are visually or hearing impaired, yet there are people with different disabilities who access the library's catalog as well. Farkas also mentioned how subject headings and page titles should be accessible to all. This was different from Roy Tennant's argument in which he argued for a clear user interface to help navigation, while Farkas advocated for a clear user interface to accommodate other technological devices like screen readers. Farkas argued that the catalog should accommodate a screen reading device, a Braille translating device, and a mobile phone. Farkas was right to call for standards and consistency amongst libraries, and she was right when she said that refusing to buy from vendors who do not comply to the ADA will only work if more libraries follow suit.

Are libraries nowadays adapting to the current technology to bring catalog standards and accessibility? We have learned about cataloging history from the past hundred years, but we have not discussed what libraries are doing in the present. Results found in a series of interviews with the library directors of five Iowa libraries (Iowa City Public Library, North Liberty Community Library, Kalona Public Library, West Liberty Public Library, and Cedar Rapids Public Library), catalogs are used for a variety of purposes, and yet there are still some surprising similarities.

Knowing your community is an important factor when building your catalog. Libraries like Kalona Public Library and West Liberty Public Library serve have specific communities that differ from the other public libraries. Kalona, Iowa (population 2,300) has a large Amish and Mennonite population. The Amish patrons, who do not normally use computers because of their religious beliefs, like to receive help from a librarian when searching the catalog. "What we do with our Amish patrons is search in the catalog, with them next to me, so we can try to get the best answer to their question," stated library director Anne Skaden. "They'll look on the screen to see if it's what they're looking for. Most often, they will come in with the title of a specific book

they saw in a catalog or magazine. We rarely own the book… so we interlibrary loan the book for them, then send them a postcard to let them know we received the book." Kalona Public Library is one of the only libraries in the area that still purchases (and consults) an encyclopedia in book format. They recently purchased a set of 2017 *World Book* encyclopedias. "It's a good thing," Skaden said defending her choice to purchase this material, "Last week it was the only place I could find current [non-computer] information… about Liberia. A student in one of the conservative schools needed it for a school report. So you can see we go back and forth depending on the patron."

West Liberty Public Library (population: 5,000) has a different community to serve. Their population is 56% Hispanic, mostly third, fourth, or even fifth generation immigrants from Mexico. Therefore, 25% of the collection at West Liberty Public Library is solely Spanish language material. Library director Jeannette McMahon takes annual trips to Mexico and Spain to buy books, funded by a grant from the American Library Association. But is the catalog in Spanish and English? "It used to be," McMahon said, "The subject headings are in English, but Spanish books are in the Spanish [language] section." She said that her Spanish-speaking patrons "know where to go," in the catalog to find what they need.

Librarians take these patrons' needs into account when choosing a catalog system as well as an integrated library system. The five libraries use different integrated library systems to help catalog their material online, such as Bibliocommons, Innovative Interfaces, and SirsiDynix. Cedar Rapids and North Liberty Public Libraries claimed to be using the top ILS in America, yet they use different systems. Cedar Rapids uses SirsiDynix Enterprise and North Liberty uses Polaris from Innovative Interfaces. Using the ILS Innovative Interfaces, the Iowa City Public Library (ICPL) recently made the switch from Catalog Classic to Catalog Pro (Encore). Catalog Classic is an indexed-based search, while Catalog Pro is a keyword search. "We moved away from Catalog Classic because we didn't want to catalog records with two different catalogs in mind," said Anne Mangano, the collections services coordinator, "But the most important reason was that the vendor no longer supported Catalog Classic. There was never going to be an update for it, no new features... Why were we investing so much time and energy for a catalog that had no future?"

In spite of the differences in library cataloging systems, all of the libraries use Overdrive system for ebooks and audiobooks and Zinio for magazines. Iowa City Public Library and North

Liberty Community Library have bundled their services with another Johnson County library, Coralville Public Library, to make a "Digital Johnson County" catalog on Overdrive. "We are all public libraries with pretty similar missions and pretty similar collection development policies," said Mangano of ICPL on teaming with the other libraries, "Our populations are pretty fluid: moving from town to town, serv[ing] the same workforce, [in the] same school district, etc." West Liberty Public Library uses Overdrive in a different way. McMahon said that she likes to work with the high school coaches, who advocate for Overdrive amongst their teams so that the student athletes can listen to audiobooks while warming up or training. Library director of the Cedar Rapids Public Library, Dara Schmidt, says that Cedar Rapids uses Overdrive and 3M because their ebook and audiobook user scope is so wide, perhaps referencing their wide range in genre interest. Cedar Rapids is also a larger Iowan city with a population of 130,000 people.

Browsability was another factor amongst the various library catalogs. Schmidt called Cedar Rapids Public Library "a browsing library" and makes sure that her catalog also has that function. "We use Enterprise, Overdrive, and 3M," said Schmidt when discussing her cataloging options. Because they have three catalogs to choose from, Cedar Rapids Public Library can serve a wide variety of patrons, which is necessary for their larger town. But even smaller towns like West Liberty Public Library and North Liberty Public Library share that sentiment. In fact, both libraries have completely changed their catalogs and collection organization from Dewey Decimal system to subject/author system. McMahon justified West Liberty's decision to switch by saying, "People browse our shelves like they do the internet." The internet is not sorted by the Dewey Decimal system, and neither is the West Liberty Public Library. Searching by subject, title, or author was very important to the North Liberty Community Library. Jennie Garner, director of the North Liberty Community Library, explained her choice to make the switch by saying, "How do people browse at Barnes & Noble? They sure don't use Dewey Decimal System!" North Liberty Community Library fuses Polaris (ILS) and Overdrive (ebook catalog) because the two are completely integrated. Therefore, when their patrons browse for a title or author online, all of the options, including ebook and digital audiobook, appear under that resource. The organization of the stacks are reflected in the organization of the catalog as well.

People visit libraries, in person and online, to search organized methods of information in order to retrieve more information. Without a catalog or "map," libraries fail to fulfill this

mission. Therefore, over the past century, librarians have focused on the efficiency and accessibility of resources like the catalog. By utilizing the technology of any given era—be it typewriters, microfilm, computers, or mobile phone applications—librarians present their catalog in ever neater, more accessible ways. By providing accessibility through technology to those who have specific searching needs, like people with disabilities, catalog-users are more apt to access library services and libraries do their job better. Though libraries in 1900 did not know what kind of future the latest technology would bring in 2017, they still shared the mission of accessibility. Regardless of era and technology, providing accessible and organized cataloging services to library users is the top priority of the public library.

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