Ten Technologies for Academic Libraries

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Introduction

Emerging technologies can assist academic librarians in many areas of their work. It is sometimes difficult to determine which technologies will be worthwhile or applicable to a particular library. To aid in this process, we have compiled a list of ten of the top technology resources for academic librarians. As job roles and responsibilities can vary widely, we have chosen technologies that address organization, cataloging, retrieval, storage, and resources for patrons including students, faculty, and staff.

3D Printing
https://www.3dhubs.com/what-is-3d-printing/

3D printing is the process of using a digital file to create three dimensional objects by laying down successive layers of material that adhere to one another (Colegrove, 2014; Ryan & Grubbs, 2014, p. 11). The most common filament materials are polylactic acid (PLA) or acrylonitrile butadiene styrene (ABS) (Gonzalez & Bennett, 2014). However, not every 3D printer model can be used with all available filament materials. Digital files are obtained by creating them with design software, scanning objects using 3D scanners, or downloading them (often at no cost) online (Gonzalez & Bennett, 2014).

3D printing can be used in coursework related to art, architecture, biomedical science, engineering and more. Students can gain understanding of difficult concepts by creating, holding, and inspecting 3D objects. Research students can create 3D visualizations of their products and ideas and develop tools to support their unique equipment needs, significantly lowering the cost of purchasing equipment (Gonzalez & Bennett, 2014). In Ryan and Grubbs (2014), we see how one small-sized academic library is using 3D printing with its chemistry department to create different types of chemical models, both by staff for instruction and by students completing mini-projects for coursework.

Automated Storage & Retrieval Systems
Video of Macquarie University Library's AS/RS

As collections in academic libraries continue to grow, there are often issues when it comes to determining the best practices for storing materials. One potential solution to this problem is an automated storage and retrieval system (or AS/RS). Consisting of several stories of metal shelving, compact storage containers, and a robotic crane, these systems will automatically retrieve items from their contents by patrons who place a request through the library's catalog (Macquarie University, 2015).

The compact design of AS/RS containers make them more spatially efficient than traditional storage methods, which means libraries can keep larger collections on site for their patrons and have more space to use for study rooms, makerspaces, new materials, etc. (Bell, 2016). A study done on the AS/RS at the National Library of Norway found that since its installation, the development of the library's collection has been optimized and it is much easier to manage the flow of materials (Mathisen, 2005, p. 101). Since the growth of a collection means that placing some materials into storage is inevitable, one of the biggest perks of having an AS/RS is that it allows for materials to be kept at the library. This will reduce the wait time from days for offsite requests to mere minutes since everything will be readily available. (Menard, 2013).

Blacklight
https://github.com/projectblacklight/blacklight/wiki/

Blacklight is an open source online public access catalog (OPAC) software developed at the University of Virginia. Its Ruby on Rails Engine provides a basic discovery interface for searching an Apache Solr index. Because Ruby on Rails is open source, it is easy and inexpensive to train library staff to use the programming language (Sadler, 2009, p. 58). Some features include: stable URLs for search and record pages which users can bookmark, share, and save for later access, JSON, RSS, and Atom Responses of search results, the ability for plugins like Zotero to easily extract data from the page for some solr documents, OpenSearch support,

faceted searching, results sorting, and tools for exporting records to Refworks or Endnote ("Blacklight Wiki", 2017).

Blacklight has Web 2.0 features such as RSS feeds, an also allows librarians to "create community-specific views of library collections, with index fields, interface design, and relevancy ranking that is configurable for each view on the collection" (Sadler, 2009, p. 57). This is critical to libraries because search engines such as Google have changed user expectations of searching in libraries (Barber, Holden, & Mayo, 2016, p. 183). Blacklight customization is especially useful with a large or diverse collection. In Barber, Holden, & Mayo (2016), we see how a large-sized academic library system is customizing Blacklight within three very different libraries to address unique materials, classification and subject schemas, and user groups.

Evernote
https://evernote.com/

As academic librarians are constantly busy with multiple tasks and projects, Evernote is a great application that can help give a sense of organization and a way of consolidating notes all into one place. According to Kani (2016), "Ultimately, Evernote offers librarians an excellent way to organize their ever-changing workflow" (p. 12). Evernote offers its users a multi-platform way of taking notes and staying organized. Academic librarians are using Evernote for a variety of different tasks. Kani (2016) says, "In Evernote, I organize patrons' research consultations, continuously update my to-do list, write articles (including this one) with the built-in word-processor, and annotate PDFs" (p. 11).

Although there are many different types of note taking applications, Evernote is appealing to academic librarians because of its many features. Some of these features include a built-in word processor, ability to capture/organize voice recordings, web pages, PDFs, and scanned documents, OCR recognition of handwritten notes, easy sharing abilities, and the ability to sync to multiple platforms.

Open Textbook Library (through the Open Textbook Network)
https://mobiusconsortium.org/otn
https://open.umn.edu/opentextbooks/

In 2017, MOBIUS joined the Open Textbook Network, "an alliance of hundreds of colleges, universities, and consortia partners working together to advance the use of open textbooks in higher education" ("Open Textbook Network", 2017). OTN manages the Open Textbook

Library which has over 350 open textbooks. These texts have been reviewed and rated by college and university faculty members. The OTN resource contains many tools to help the academic librarian aid professors and other faculty members in choosing and adopting open textbooks for their courses.

Current research indicates that many college students struggle with the cost of textbooks. A study done at Mizzou shows that some students put off or choose not to purchase the required text and even considered leaving the university because of not being able to afford the course materials (Virden & Atkins, 2017). The Open Textbook Network can help academic librarians educate faculty on the Open Textbook Library and the use, rights, and adaptability of open textbooks. Academic librarians can use this resource to address and overcome the barriers to adoption, such as concerns about the quality of texts, access, and student learning outcomes.

Pic2shop App
http://www.pic2shop.com/
Link to Pic2shop being used in libraries

With costs on the rise of items such as clothing, cars, and food, why spend money on books that you can check out at your local academic/public library? The Pic2shop application is so easy, well developed, and has been around since 2009. It can be used by anyone that is searching for a book. The first step is downloading the app on your mobile device. You then scan the barcode and a list of libraries that own that particular item will be produced right on your phone. Pic2shop is not only free but could help academic librarians in many ways such as saving time because patrons do not have to call the library; they do it all themselves so a librarian would not have to do it. Plus, it is more convenient for the patron and it gets people coming in the library!

Pic2shop is an emerging technology because it has not grown legs yet. Many libraries have not connected with this service but should. Some apps that compare to Pic2Shop are Bar-Code and i-nigmaQR Code/Data Matrix. Both of them are free but Bar-Code does not produce a list of libraries where an item is located and has quite a few popups. The I-nigmaQR Code/Data Matrix app fails to produce a list of libraries as well.

PlumX Metrics
https://plumanalytics.com/
With the rise of online social networks, reference managers, and digital repositories, traditional measures of impact (such as citation counts in select journals) may

not fully express a work's significance or influence. PlumX Metrics is an online resource that tracks alt-metrics. PlumX Metrics has a few different products depending on the institution's goals, such as understanding available funding or grant opportunities, or seeing the reach of your institutional repository. These products attempt to give the bigger picture of impact by including various forms of engagement in measuring research and scholarly work's impact.

The tool gathers data regarding research metrics in five categories: usage, mentions, captures, social media and citations. This data can be gathered on many types of research outputs, called artifacts, such as blogs, interviews, videos, and maps. This can help the academic librarian in three specific areas of their work: showcase achievements of their institution's scholarly output, monitor usage of journals, and support research evaluation for faculty and administration (National Information Standards Organization, 2016, p. 2).

QR Codes
http://www.qr-code-generator.com/

QR, or "quick response", codes are barcodes that contain information about the item they are attached to. Originally created in Japan in 1994, QR Codes were initially used to keep track of vehicles and parts during manufacturing (White, n.d.). The popularity of this form of information storage increased and, with the development of smartphones, these codes eventually found their way into the daily lives of consumers.

Given QR Codes were created to be a data storage tool, it should come as no surprise that libraries have taken notice of their potential. Academic librarians can create QR Codes for individual texts, with information on other books by the author, on the same subject, information on referencing, and their shelf location (Rodriguez & Rivero, 2016, p. 22). These codes could also be used to link to instructional videos informing patrons on other library services available to them. These uses would be beneficial in an academic library setting, as they would give users instantaneous access to information they needed. QR Code creator Denso Wave has released the patent on the technology to the public, so they are free to create and use (try it here) (Xu, 2014, p. 346). Since most college students have access to smartphones, QR Codes are a low cost and low risk technology for any library to use.

Trello
https://trello.com/

Just as many things today, numerous facets of organization management have transitioned to being online. With apps like Trello, one can create boards, lists, and projects all online that are easily shared with coworkers. Although Trello can be easily adapted to use in just about any setting, many academic librarians have been using Trello to plan and complete projects in a collaborative way. According to Chen and Chen (2017), "Trello has helped us to enhance project planning and improve our productivity. Due to its highly visual and flexible features, we can oversee our projects clearly, monitoring and tracking each one's progress in real time" (p. 23).

Although many other organization management sites and apps exist, Trello is appealing to many because of its user friendly and highly visual interface. As mentioned above, Chen and Chen (2017) from the Kennesaw State University's Library found Trello to be more helpful when planning and collaborating with projects because of how visual and clear the cards on Trello made their ideas and tasks seem. Trello is also appealing to many academic librarians because of the numerous deadlines they have. Because there is a notification alert through Trello, one can make cards of different project deadlines and set notifications to each. One will then receive an email alert as a reminder of upcoming deadlines.

WolframAlpha
https://www.wolframalpha.com/
Comparison between Central Alabama Community College and Lurleen B Wallace Community College.

WolframAlpha is a search engine released in May 2009 that allows users to ask questions, generate reports, and analyze different subjects. It has been compared many to Google Search, DuckDuckGo, and Symbolab, and is described as being able to "give you a side-by-side comparison of basic facts about each library's collection, loan activity, and finances; very helpful in academic libraries" ("Checking Out", 2012).

Academic libraries can use this search engine for many reasons. One that stands out is the capability of WolframAlpha to search and produce information in over 30 different languages. This could help a librarian interact with a patron with limited or even no English speaking ability. Nothing else on the market rivals this powerful search engine.

References

Barber, M., Holden, C., & Mayo, J. L. (2016). Customizing an open source discovery layer at East Carolina University libraries: The cataloger's role in developing a replacement for a traditional online catalog. *Library Resources & Technical Services, 60*(3), 182-190.

Bell, S. (2016, January 19). One technology that will change the academic library experience. Retrieved from http://lj.libraryjournal.com/2015/12/opinion/steven-bell/one-technology-that-will-change-the-academic-library-experience-from-the-bell-tower/

Blacklight wiki. (2017, October 16). Retrieved November 24, 2017, from https://github.com/projectblacklight/blacklight/wiki

Checking out libraries with Wolfram|Alpha. (2012, October 25). Retrieved from http://blog.wolframalpha.com/2012/10/25/checking-out-libraries-with-wolframalpha/

Chen, L., & Chen, X. (2017). How to manage library projects with Trello. *Computers in Libraries, 37*(4), 19-23.

Colegrove, P. (2014). Making it real: 3D printing as a library service. *EDUCAUSE Review, 49*(5).

Gonzalez, S. R., & Bennett, D. B. (2014). Planning and implementing a 3D printing service in an academic library. *Issues in Science and Technology Librarianship, 78*, 1-14. doi:10.5062/F4M043CC

Kani, J. (2016). Evernote for librarians. *Mississippi Libraries, 79*(1), 11-12.

Macquarie University. (2015). Macquarie university library - Automated storage and retrieval system [Video file]. Retrieved from https://www.youtube.com/watch?v=5SegEbE_QhM

Mathisen, K. (2005). From traditional stacks to an automated storage and retrieval system. *Library Management, 26*(1/2), 97-101. doi:10.1108/01435120510572923

Menard, D. (2013, July 19). Liberty news. Retrieved from http://www.liberty.edu/news/index.cfm?PID=18495&MID=95369

National Information Standards Organization. (2016). *Outputs of the NISO Alternative Assessment Metrics Project*. Retrieved from http://www.niso.org/apps/group_public/download.php/17091/NISO/RP-25-2016/Outputs/of/the/NISO/Alternative/Assessment/Project.pdf

Open Textbook Network. (2017). Retrieved from https://mobiusconsortium.org/otn

Peters, T. A., & Bell, L. (2013). *The handheld library: Mobile technology and the librarian*. Santa Barbara, California: Libraries Unlimited.

Rodríguez, R. A., & Rivero, M. O. (2016). Information skills training through mobile devices. *The Electronic Library, 34*(1), 116-131. doi:10.1108/el-04-2014-0061

Ryan, S., & Grubbs, W. T. (2014). Inspiring innovation: Collaboration in support of 3D printing as an emerging technology in libraries. *Florida Libraries, 57*(2), 11-18.

Sadler, E. (2009). Project Blacklight: a next generation library catalog at a first-generation university. *Library Hi Tech, 27*(1), 57-67. doi:10.1108/07378830910942919

Virden, C., & Atkins, G. (2017). MOBIUS Open Textbook Network kickoff. Retrieved from https://attendee.gotowebinar.com/recording/6031251573178595074

White, M. (n.d.). History of QR codes. Retrieved from http://www.mobile-qr-codes.org/history-of-qr-codes.html

Xu, F. (2014). QR Codes and library bibliographic records. *Vine, 44*(3), 345-356. doi:10.1108/vine-12-2013-0070