

## CHAPTER 2

# Introduction: Science Libraries and Service Innovation

*The first step in reimagining the academic libraries is to determine the jobs we are being hired to do. As we do so we need to recognize that at the end of the day what we should be about is not saving the library. Rather . . . it should be about providing a product or service that can help students and faculty more effectively, conveniently and affordably, do a job they've been trying to do in their scholarly lives. If the library is to provide value, it needs to find those jobs it can do that cannot be done more effectively by others.*

*Lewis (2016)*

The changes that networked technology have brought were anticipated nowhere more eagerly than in libraries. When we first imagined connecting computers seamlessly to electronic books, journals, catalogs and indexes, it seemed as if an ocean of information would be available in digital form and any of us could find out anything we wanted on demand. Many subsequently thought that libraries would be rendered obsolete. And while it is true that libraries have not gone away, librarians have to admit that today some collections and services are used far less than they once were.

Until the 1990s, for example, library users had to engage in personal contact at the library to use most services. Just about the only thing a library user could do for him or herself was find a book in the catalog. Users required personal assistance when searching bibliographic databases, locating and retrieving materials, getting reference help, and borrowing via interlibrary loan. These all required some exchange—by telephone or in person—with a librarian. Today most of these services can be both requested and delivered digitally from outside the library building.

Certainly, the “ready reference” type questions that people once called the public library to answer are no longer necessarily answered by librarians. Questions like, Who was the vice president under Theodore Roosevelt?<sup>1</sup> or In what year did Malaysia gain independence from

<sup>1</sup> No vice president during his first term; Charles W. Fairbanks during his second term.

Britain?<sup>2</sup> are the questions that we can answer more quickly ourselves than by calling or visiting a library as we may have done in the past.

As for collections, take a moment to think of all the books that once occupied the reference area but that have been replaced by search engines and other web resources. Many mainstream dictionaries and thesauruses, road atlases, telephone directories, almanacs, encyclopedias, and other books on the reference shelves are not consulted nearly as much today since anyone with an internet connection can find for him/herself the information that was once exclusive to these printed materials. Despite this automation; the connectedness of a vast majority of the world; and the emergence of things like Google Scholar, Google Books, and many other trappings of the Internet, we still have libraries and librarians. However, current trends indicate that it will become necessary for libraries to develop new services to remain relevant to their parent institution.

## **BUSINESS AND SELF-SERVICE**

To the general public, it is in the business world where the effects of the Internet are most easily recognizable. Facing ever-increasing cost pressures, business have tried to reduce expenses by enticing customers to help themselves, often using the Internet to push many day-to-day activities toward a self-service model. It happened, for example, with retail and banking and government services, as users of these services often no longer require interpersonal contact to transact most business. Instead, people can now take care of many routine services themselves online as they do their shopping, pay their taxes, renew their automobile registration, or a host of other activities which once required an in-person transaction.

In addition to traditional retail transactions, communication media has also gone digital. At one time, we physically handled movies, music, newspapers, and magazines, often visiting a store or library and buying, renting, or borrowing the item to bring home. Today much of our popular media is streamed online. And while electronic books may not yet be widely adopted due to a number of factors, clearly the current trends in retrieval and consumption of entertainment and other media follows the online self-service model we see with other organizations.

<sup>2</sup> 1957.

## APPLICATION TO LIBRARIES

Research libraries may not be subject to the same forces or to the same degree as companies in the private sector, but because *all* organizations are interested in controlling costs and making operations more efficient, it is inevitable that libraries in some ways mimic trends we see in the business world (Mullins et al., 2007). Whether or not libraries wholeheartedly embrace this way of service transaction, it is clear that users of science libraries are keen to adopt at least to some degree the self-service model we have seen develop in other parts of our lives.

This is exemplified by the migration of scientists to adopt electronic journals (perhaps after some initial reluctance). Primarily because of the publication practices and formats in the sciences, self-service literature retrieval is most pronounced in science libraries. In most disciplines, articles are the common currency of scientific communication. The peer-reviewed scientific paper tends to be 10 pages or less in length (varying by subdiscipline) which lends itself to digital delivery and sharing in a way that longer form publications do not.

No longer is it necessary to visit the library and pull a journal volume to photocopy an article since a growing body of this literature is available online not only from the publisher but in repositories and other sources. The easy distribution of papers as PDF files has led to informal networks of sharing reprints among scientists. The inclusion of email addresses in journal articles ensures that if all else fails, a reader can easily contact one of the coauthors and request a reply with the article attached if available.

## REDUCED LIBRARY VISITS

This increasing availability of digital versions of scientific papers and the consequent reduction in library visits may ultimately diminish the visibility of science libraries. It is clear that scientists' visits to their research library have been sharply reduced in the digital era (The Advisory Board Company, 2011). Many scientists still embrace the nostalgia of perusing the library stacks as reminiscent of their own days in the university, but today time is too tight for this luxury (Flaxbart, 2001; Haines et al., 2010). The trend toward consolidation of science libraries within university library systems is a clear recognition of the reduction of in-person visits (Zdravkovska, 2011). Despite efforts by librarians to publicize the indexes and other resources which they license, many scientists find

articles themselves online via Google Scholar and other web searches (although they may not realize the content is available to them only because they are on the campus network where access has been arranged by the library).

## **USER GROUPS**

The “help-yourself” style of online library usage and the corresponding decline in library visits means that in order to survive organizationally, librarians have had to develop not only new services for existing users but also for new user groups. New service creation often requires identifying new audiences and their needs. These user groups can be individuals who have typically not visited or come in contact with the library for research purposes in the past but can also include the traditional users who have needs beyond literature retrieval that libraries may be in a position to serve. In both cases, new activities and processes must be established, or else science libraries may become little more than legacy print storage, content licensing, and interlibrary loan operations.

## **SAME USERS**

Researchers have traditionally used the library to collect references and reading material to support a larger cycle of research activity which includes grant writing, field and lab work, and communicating their findings. But today, science library users are being served in ways which go beyond collection development and access to purchased or licensed resources. It is becoming more obvious to science librarians that the same people who have used the libraries for years to find reading material have now emerged as a new user community based on different needs. While the recipient of support is a familiar face to the science library staff, in that sense, they represent a “new” audience. Service to this community is one of the foundations of recent innovation in science library services ([Kronman and Lundén, 2013](#)).

Hence, science librarians are beginning to identify different stages of the research life cycle where they can inject new services and renew the library’s status as a service provider. Services like data-management consultation; open-access advocacy; guidance on compliance with public-access mandates; and digitizing, enhancing, and publicizing research outcomes are activities that science librarians have moved into given new

emphases in research organizations. The open-access movement in particular has spawned a suite of services that target the traditional library user in new ways. In order to provide these new services, many science librarians are recognizing the new usage patterns of the library and taking advantage of time no longer spent on traditional activities which had been dependent on in-person visits by patrons. The development of these nontraditional services ensures that science librarians continue to provide value to the organization where their roles may have otherwise been eroded.

A simple example of a service which may have become obsolete in science libraries recently is the daily display and rotation of new journal issues. The routine may be familiar to science librarians as a long standing part of journal-issue processing, but it is a mostly outdated method of keeping abreast of current literature in the digital era. Many scientists have discovered and helped themselves to table of contents and alerts services online or via email which eliminates the need to browse the daily display. This means that librarians no longer need to sort incoming journal issues by date of receipt, track how long they should be displayed, and then manually shelve them with the bound issues on the shelves. This service is no longer essential and used less and less by scientists today (Flaxbart, 2001). And in fact, many science libraries today have either canceled the print version or canceled altogether many subscriptions due to budget pressures such that the journal issues available for display are fewer in most libraries. The time saved from discontinuing this handling of physical issues (and other traditional but little used services) is likely better spent on new activities designed to support other segments of the research process.

## **NEW USERS**

The emergence of nontraditional library activity parallels to many businesses over the years which have had to move into a different product line in order to remain relevant (Mullen, 2010, p. 138). Successful businesses tend to move into the most profitable product or service line, regardless of their original mission. For example, Apple, IBM, General Electric, and many other companies at one time or another have successfully moved to a new product over the years (Sanburn, 2011), presumably because the return on investment was greater in a new service or product area. And while librarians may not be motivated by profits, high usage is

in a sense an adequate proxy for profits. In any event, science librarians cannot ignore the need to cultivate different user groups at their institutions (Feltes et al., 2012) since the original user group—the reader—increasingly has his/her demands satisfied without the need for interpersonal contact with a librarian.

These new user groups are found in organizational units at research institutions that typically do not visit the library, or if they do, they may only be looking for a quiet place to get away. Staff outside of research units may not yet realize what librarians can do for them. These include offices of public affairs, social media, higher administration, IT/webmasters, sponsored research and advancement, and fundraising, to name a few. Librarians possess the skills and knowledge to help these groups perform their functions better in ways that may not be apparent to either librarian or these new constituents since these groups' service needs are not typically met by scientific and technical reading material.

For example, a collection of information about research being conducted at the institution can be a valuable resource for these underserved offices. Compiling research publication metadata (an institutional or faculty bibliography) representing scholarship produced at the institution is one valuable resource that can be leveraged for many subsequent services. This data can be reused for academic computing, the creation of dynamic website content, public information offices, social media, or fundraising groups to inform them of current research. Many science libraries are moving into expanded researcher profiling services which collect a complete picture of the work of the scholars who are affiliated with the organization. This is equally useful for those mentioned earlier who need to keep abreast of current research at the organization.

The recognition of these new audiences is evident in the products and services recently offered by library vendors. Many represent a movement away from traditional abstracting and indexing service and into research evaluation tools marketed directly to university administration. Likewise, publishers have responded to the open access (OA) movement and other changes by acknowledging the need for new audiences or offering new services to existing audiences. Many of them have launched new or have enhanced existing services such as researcher identification and profiling systems, institutional aggregation of data for metrics and evaluation and others outside the services for which they have been well-known for years (Dempsey, 2014). The possibilities to serve users outside the traditional scientist group vary by institution, but the bottom line is that the

return on investment of providing literature to which users can increasingly help themselves is diminishing.

## **COST SAVINGS AS A SERVICE**

In addition to developing new services and/or finding new audiences, a highly valued activity in any organization is providing an existing service at a lower cost. This should not be overlooked when science librarians think about creating value for an organization. Doing things with fewer resources often goes unnoticed by the direct recipient of the service but is aimed at upper administration of an organization who always appreciate conserving scarce resources—the most scarce being money and space (we have already seen how libraries save time, another scarce resource). Holding down costs inevitably improves services as far as the institutional management is concerned and librarians can consider delivering service more efficiently as a service to the institution as a whole (Courant, 2008).

The move toward access rather than ownership is yet another trend from the business world which is influencing library work. Just as the rise of the “sharing economy” emphasizes access rather than ownership of goods (Eckhardt and Bardhi, 2015), libraries are now providing access to content rather than purchasing it outright. Licensing electronic content is one of the new processes that librarians have had to learn in the digital era. In this sense, libraries and publishers have moved from product to service. One might draw a comparison to the US economy as a whole, which has moved away from manufacturing and toward services. American Library Association past president, Feldman (2015), may have put it best, “the future relevance of libraries and library professionals will depend on what we *do* for people rather than what we *have* for people” [emphasis mine].

Another service in the realm of resource saving comes in the form of consolidation of print collections. Moving print materials to an off-site storage facility with perhaps a scan-on-demand component frees up space on campus which organizations’ administration will appreciate. The off-site storage of legacy print collections and consortial arrangements with like institutions to share print storage and/or cooperatively collect print collections can save space on the central campus, and this is a very valuable resource for the institution as a whole (Lynn et al., 2011). Given the reduction in personal visits to the library, the newfound space can be used for different purposes by the libraries or the institution.

The examples showing the different service models are intentionally drawn to show a parallel to the business world. This may be objectionable to librarians who work in academic institutions, but this will inevitably change. As a 2007 ACRL report declares, “Students will increasingly view themselves as customers and consumers, expecting high-quality facilities and services” (Mullins et al., 2007). We can safely substitute “researchers” or “scientists” for the term “students.” The use of business terms is intentional if somewhat unpalatable to a profession rooted in public service and education. However, any research library director today knows that costs must be controlled and services shifted in response to a changing funding landscape.

## SHIFTING PRIORITIES

All the new services mentioned here are possible only after scientists’ need or interest in existing services wane and the service is discontinued (see displaying current journals above). Freeing up staff time is necessary to provide more targeted support to scientists with new services, and it will require reevaluating activities which do not have a high return on the investment of time. In addition, support from library leadership for reprioritization of activities and resources (both monetary and human) are essential for new service sustainability over time (Vinopal and McCormick, 2013).

It is common for scientists to react to new services of this kind with skepticism and reluctance. This may be due to their traditional perception of librarians and their duties and association with print materials’ collecting. While some scientists feel overwhelmed by administrative demands of research and publishing and may likewise be slow to adopt digital technologies to ease these new burdens, many still feel that librarians do not understand and have no place in their research workflow. Development and adoption of new services can therefore be slow. The best approach to implementation will vary by institution, but sometimes, informal conversation and information gathering are helpful as is a stealth launch or pilot to test receptivity of users.

A worthwhile strategy in many cases is to work with incoming graduate or postdoctoral students. Being digital natives and in the early part of their career, these people are often very receptive and eager to consider working with the library in new ways. Typically, postdocs and graduate students are younger and more open to technological solutions to research

problems. They also generally are the ones on whom the administration of research activity will fall anyway, including data collection, transcription, writing manuscripts, and other manual tasks. They have the ear of senior scientists and perhaps their trust at least with regard to activities not traditionally associated with library staff. These younger scholars are hungry for any opportunity to advance their careers and are consequently open to innovation and anything that may distinguish them in the eyes of senior scientists who enjoy some degree of exemption from these new ways of managing and producing research.

## **BIOMEDICAL ROOTS**

Many innovative library services and tools began in the biomedical area and spread to other life sciences. This is undoubtedly due to the head start that biomedical and hospital libraries have enjoyed thanks to the work done at the National Library of Medicine. Certainly, Medline/PubMed is widely regarded as the granddaddy of online bibliographic databases as is evidenced by the widespread adoption of the PubMed Identifier. Probably because medical research had the most practical application and broad appeal (healthcare improvement), the resources were made available to index and unify the biomedical literature before many other indexing and abstracting services were available. Another strong indication of the NLM's leadership position in providing the platform for service development is the widespread adoption of the Journal Article Tagging Suite, a NISO standard for publishing scientific literature online that began at the NLM and the PubMed Central repository. In addition, the fact that both VIVO and Profiles RNS research information management systems were originally funded by NIH attests to the well-developed informatics and research infrastructure in the biomedical sciences.

It may be helpful to think of the NLM impact on scientific literature as analogous to the Library of Congress' impact on cataloging monographs. Science librarians who follow service innovation can thank the early investment in the NLM for creating standards and platforms which have enabled many of the self-service components of library use today.

## **MEDIATE AUTOMATED SERVICES—AT FIRST**

One pattern that seems to be repeated in research libraries is the intermediate adoption of online tools and services by librarians on behalf of patrons. Rather than train patrons on how to set up services (alerts, searches, etc.), it is often more fruitful for the librarian to do so on behalf of the scientist and forward results to him/her. Scientists, especially those with established labs and careers, are busy and often understandably reluctant to engage with new features and innovations, that is, until the librarian proves its value. If the service provides value, often the scientists who were too busy to investigate initially often help themselves and create their own accounts, subscriptions, or otherwise engages the service directly.

## **ABOUT THIS BOOK**

This book is intended for science librarians and others who work in research libraries and who are beginning to recognize that the world of digital storage and delivery of publications has changed the way that our physical spaces are used. Librarians who may not have yet had the opportunity to plan and develop new services but who are ready to respond to the research needs of scientists beyond developing and managing collections and providing reference are the primary audience of this book. Librarians who may understand that their skills are most cost effective in collecting, curating, and exposing research materials created by their institution's scientists rather than externally published material but who have not begun to implement some of the ideas they have developed should find this book a good place to begin if nothing else.

Finally, a note about the speed of change in the digital world. This book illustrates the variety of new, nontraditional services being tested and offered in science libraries today. Because information technology moves quickly, it may turn out that the ideas and suggestions for new services in science libraries will become obsolete just as quickly. Many of the tools described here which are used in implementing new services may soon be obsolete, acquired by other companies, rebranded, etc. For that reason, the recommendations in this book are mentioned here only as examples.

But the idea remains the same: needs of science library users are changing, and increasingly, scientists are able to meet their own needs for

finding or retrieving research publications. This is an activity that librarians—while not abandoning completely—can safely cede to their users. This concession, while it may appear to undermine the usefulness of having a librarian, will actually allow them to create and implement services that fill long standing research support needs in the organization.

Scientists' library needs will continue to change as long as models for publishing and scientific communication evolve. In order to meet these new needs, science librarians will have to keep current on new tools and services, explore their feasibility for supporting library services, and adopt or abandon them as quickly as they emerge. Some of the implications may violate the foundations of what many of us were taught while earning a traditional degree in library science, but it is a reality we need to confront in order to survive professionally.

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