The Relationship between Human Librarians and Library Systems. Catalogs and Collections

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Introduction

There have been many studies of library use, of library users, and the relationship between readers and library services. Here we examine the relationship between *librarians* and library systems, a topic that has received much less attention, with special attention to the nature and role of the library catalog. This paper is a companion piece to an earlier paper "Library technology in the next twenty years" (Buckland 2017).

The ideal librarian

We start with the concept of the ideal librarian who knows the collection well and who understands the readers and their interests. In the seventeenth and eighteenth centuries libraries were small, compared with today, and readers were few. A scholarly librarian would arrange the collection in what he considered a natural order and would be more or less familiar with it. Little attention was paid to catalogs. The librarian would mediate the collection for the few readers. The librarian was personally the interface between

readers and the collection. Then as now, small libraries –special libraries, school libraries, and small public libraries– can provide the best service because the scale of operation is limited and interactions more personal. There are, however, two design problems with librarians:

1. *Capacity*. Humans have a limited capacity, so increases in quantity become a problem. Remaining familiar with a collection becomes more difficult as the collection becomes larger. It is more difficult to understand readers' needs as the number or the diversity of readers increases. More librarians can be added, but, individually, each one will be less able to mediate a larger, more complex situation than a smaller one. This is more than an economic challenge. It is a matter of capability. In engineering terminology, humans do not scale well.

2. *Reliability and continuity*. There is risk of failure. If the librarian is the primary interface between the collection and readers, there is a serious problem if the librarian leaves, dies, or has memory problems. The interface is broken. In engineering terminology, human librarians are prone to catastrophic failure.

With increasing knowledge, increasing publication, increasing users, and more diverse readers, the continuing challenge for librarianship is to expand to large scales. For this reason a crisis was developing for European libraries during the eighteenth century.

AN EVENT 200 YEARS AGO

Towards the end of the eighteenth century in Roman Catholic countries in Europe there was a program of secularization in which monarchs closed monasteries and similar religious institutions and confiscated their properties. In Bavaria around 1800 this process resulted in two hundred monastic libraries being sent

to Munich to be added to the royal library, which was incapable of absorbing all this material. In the end, Martin Schrettinger, a former monk who became a librarian, solved the problem. His approach was to reduce dependence on human librarians by introducing a *library system* that could support self-service by the readers, rather like a modern supermarket.

In 1808 Schrettinger published a book to explain his approach entitled *Versuch eines vollständigen Lehrbuchs der Bibliothek-Wissenschaft oder Anleitung zur vollkommenen Gestäftsführung eines Bibliothekars in wissenschaftlicher Form abgefasst*, which can be translated as "Attempt at a complete textbook of library science, or primer for complete management for a librarian, prepared in a scholarly form." This appears to be the first use of the phrase Library Science. The first sentence of the book provides Schrettinger's practical view of the purpose of a library and his insistence on the importance of having a *system*: "A 'library' is a large collection of books *whose organization enables every knowledge seeker* to use every treatise it contains without unnecessary delay according to his needs" (Schrettinger 1808, 11. Emphasis added).

This is the approach later adopted by Melvil Dewey and others. Schrettinger's specific design was simple: Every volume should have a unique identification and shelf location, and a good catalog would have a link from each record to the specific shelf location. A subject catalog was desirable. Schrettinger favored a simple subject arrangement on the shelves bringing related topics together, but subject arrangement on the shelves was not essential.

What Schrettinger designed was a system constructed as an alternative to (and so a replacement for) the librarian as an intermediary. The system enables "every knowledge seeker" to find material in the library's collection without asking the librarian for guidance.

LIBRARY SYSTEMS REPRESENT THE LIBRARIAN

Library catalog records represent what the librarian believes about each book and, by extension, what the librarian believes about the

collection. It is not a complete representation. For example, catalog records do not state the librarian's belief that a book is unreliable or that it has been superseded by some other newer book. Additional beliefs about a book could be added to the note field on existing catalog records within existing cataloging practices, but very rarely are. On the other hand, the catalog remembers more reliably than a human librarian can.

Catalog theory can also be considered incomplete. Existing catalog theory is concerned with the effectiveness and the efficiency of catalog records as descriptions for the discovery of documents. If we accept that catalog records represent the knowledge and beliefs of the librarian, then a comprehensive catalog theory should, at least in principle, also include examination of this phenomenon. How effectively, efficiently, and usefully do the catalog records represent the culture and knowledge of the librarian? Should not catalog theory also include the forensic analysis of catalog records as reflecting the librarian, as bibliographical anthropology?

There is already a relevant body of literature on this topic. Sanford Berman's *Prejudices and antipathies: a tract concerning the LC subject heads* (1971) is a good example. It forcefully denounced numerous now-unfashionable social attitudes reflected in Library of Congress Subject Headings (Berman 1971; also Bowker and Star 1999, Buckland 2012). However, these studies are not ordinarily viewed as part of catalog theory and address only social attitudes, just one aspect of a wider range of possibilities. Since a catalog is a special case of bibliography, the same criticism also applies, more or less, to the theory and practice of descriptive bibliography. A bibliography reflects the bibliographer as well as the items listed in the bibliography.

The standard view is that catalog records make the books that are available in the collection discoverable by the reader, so evaluation needs to ask how adequate and effective the catalog is in selecting the most suitable items for each readers' purpose. But the catalog and the collection are becoming decreasingly important.

CLASSIC LIBRARY ACCESS DESIGN

The classic view of library catalogs can be summarized as follows:

1. Library catalogs record locally owned documents. Union catalogs include books owned locally by each of two or more libraries.

2. Each catalog entry records what the librarian knows or assumes. If the librarian does not know that a book is a pseudonymous work or that it has a fictitious imprint then the catalog record will not provide this information. Also, it is not an exact and complete representation, but a limited set of attributes. It will exclude some details of specialized interest, e.g. that the book is plagiarized or has a particular point of view. However, the catalog remembers better and remembers more than any one librarian can. It can preserve what the librarian has forgotten and the knowledge of earlier, departed librarians. And since a catalog can increase in size indefinitely, its memory expands better than any human's memory can.

3. A library catalog is a specialized genre of bibliography. It is constrained in scope to a single collection and distinguished from a bibliography by the addition of call numbers indicating documents' locations. Bibliographies describe documents and are used to discover and identify desirable items, but for economic reasons bibliographies do not lead to a copy in a paper environment. Typically any item listed in a bibliography is held in thousands of libraries and naming the location of a single copy in a bibliography will be of very little utility. A reader wants to know where the nearest or the most accessible copy is, not just the location of a single copy the compiler happens to have seen, possibly thousands of kilometers away. Listing all or most copies would be intolerably expensive and impossible to keep current.

4. Catalogs record publishers' units (whole books and periodical titles) and not, ordinarily, intellectual or literary units when different from publishers' units. This is not matter of

cataloging principle, since cataloging rules provide for this to be done using "analytical entries" (Hyman 1978). Providing analytical entries for intellectual units within books and journals has been tried but it is simply too expensive as a local undertaking. Separately published bibliographies are relied on instead. The many well-developed abstracting and indexing services have been more successful for articles within periodicals than for intellectual units within books.

5. Subject catalogs are an acceptable and needed alternative for subject arrangement on open shelves. One can browse a subject catalog or shelflist in lieu of looking on the shelves. This is important since ordinarily the most popular items are absent on loan and large portions of a library's collection may be in storage, on closed access shelving, or scattered across multiple locations.

6. Standardization brings beneficial cost-effective uniformity for everyone because standardized records allow economies through collaboration. Library collections are more or less similar, so a single record created for one library can also be used by many other libraries. Also, consistency in description makes records easier to search and to understand.

As the long term consequences of the shift from paper to digital media become clearer these features of the catalog, traditionally the key to library service, can be seen as increasingly less adequate.

PAPER AND ELECTRONIC LIBRARY ENVIRONMENTS

I have found it helpful to think of library technology stages using the three ideal types shown in Figure 1.

Fig. 1. Library Technology: Three ideal types

	Library records	Library resources
Paper library	Paper & card	Paper
	↓	
Automated library	Computer	Paper
		↓
Digital / Electronic	Computer	Digital

Before the use of digital computers, both library records and library resources were on paper or some similar local medium, such as microfilm. This meant that all use of records and of resources was strictly and unavoidably local. Library records gradually became computer-based, leading to the automated library in which records are digital and, in principle, remotely accessible, but the library's collections remained predominantly on paper and so local. In the second move, to a digital library, the libraries collections are also digital and so are also, in principle, remotely accessible. Figure 1 shows these idealized types. In practice, any existing library is likely to be some combination of these three types. Networks now provide affordable access to remote resources. Readers too, now, make use of both paper and digital resources, so there has been a fundamental shift from local service to widespread access and service (Buckland 1992).

In a paper environment what is collected determines what is accessible without the expense and the delays of interlibrary loan or personal travel. Union catalogs extend access to remote catalog records but not to the remote resources themselves. So the local collection effectively defines service on two principles: (1) Supplying what readers' are expected to request; and (2) Recommending (selecting and presenting) what the librarian believes would be beneficial for readers.

In an electronic environment, however, the supplying and the recommending become separate. Physical access becomes an engineering problem outside librarians' control. Selecting which resources to recommend remains as important but providing access is now mostly wholesale through licenses than retail through title

by title selection. The local catalog remains a record of what is owned, but it now becomes less and less complete as a record of what is accessible. The difference is important. Readers are interested in access not ownership. So the local collection and the local catalog become less and less complete in indicating what is accessible and so less and less important.

TWO MAJOR CHANGES: LICENSES AND OPEN ACCESS

The move to digital technology has added two major new developments to collection management. In both cases access and ownership are separated:

1. Licensing. Increasingly, publishers or consolidators provide access to a large corpus if a library has paid a licensing fee. Access to resources is provided temporarily during the period of the license. This has the same effect as temporary ownership. Search support may be through discovery systems separate from the library's catalog. For both reasons, access to digital resources is less and less constrained by the traditionally local practices of selection, acquisition, cataloging, and storage.

2. Open access. Openly available networked resources are a wonderful development for both readers and librarians and many initiatives are promoting the development of open access in various ways. Like many other institutions, my own university, the University of California, provides a repository through which deposited material is made openly available: http://escholarship.org/. The University has also changed its terms of employment. Professors and other staff are now obliged, whenever they publish an article, to ensure that a copy is made available with open access if the publisher is not an open access publisher (University of California 2015).

With both licenses and open access, availability extends well beyond the locally acquired collection and raises questions about the library's catalog. In the case of licensing, the provider could supply catalog records for the licensed material for the duration of the license. These records can be included in the catalog and a temporary relationship between ownership and access survives. But with open access there is no longer any such connection.

Example 1: The *Proceedings of the Document Academy* publishes articles about documents and documentation. It is published, open access, as a public service by the University of Akron, Ohio, and it is as accessible as any electronic journal acquired or licensed for my library's collection. It is of more interest to me than almost all the other titles in my library's collection, but it is not in the catalog because the library did not pay for it. The logic is clear but the outcome less than ideal. Adding a record for this title to my library's collection would be an improvement in service and a trivial task procedurally, if the librarian were aware of this option.

Example 2: I recently needed to consult a book for which there is no good alternative: Sylvie Fayet-Scribe's, *Histoire de la documentation en France* (2000). My personal copy is lost, lent to a friend and never returned. I cannot buy a new copy because it is now out of print. A Web search revealed that I could buy a second-hand copy at little cost but there would be a delay for delivery. Fortunately, my library's catalog shows that the library has a copy in storage, available with only a little delay, and I was able to obtain it. Later I found, entirely by chance when looking for something else, that a digitized copy of this book is openly available at http://books.openedition.org/editionscnrs/8555. My library's catalog records the books that it has acquired and for books available through some other arrangements, such as participation in the Hathi Trust. If the catalog had similarly included a link to the resources of this open access repository, then it would have been a small improvement in the library's excellent level of service and a slight reduction in labor for retrieval from storage.

With both examples, providing a record in my library's catalog would be a small and useful step. But providing a record for all

open access journals and books would be difficult and expensive under present conditions. And this is not the only option: union catalogs (e.g. WorldCat) and Web services (e.g. Google Scholar) are other options. The problems are organizational as well as technical and have received attention (e.g. Bhatt 2010; Martin 2010; McCollough 2017; Young, Culbertson and McGrath 2013), but much more needs to be done.

CRITIQUE OF CLASSIC LIBRARY ACCESS

Reviewing what we described above as classic library access, we can add the following comments:

1. Given the divergence between what is collected and what is accessible in an internet environment, library catalogs recording locally-owned documents become progressively less complete in providing guidance to what is accessible. They also represent available paper copies rather than available digital copies.

2. Although bibliographies describe documents and are used to discover and identify desirable items, they do not lead to a physical copy in a paper environment because attempting to do so could not be cost-effective. That task requires a separate subsequent search in library catalogs. In contrast, in a networked environment *only one* location of an accessible copy need be recorded, and the benefit of adding a single location (a link) is enormous. One can get the best features of a bibliography (good description) and of a catalog (locating of a physical copy). The potential was demonstrated some thirty years ago when the University of California adapted its online catalog (named MELVYL), loaded the Medline records created by the National Library of Medicine, and linked the journal titles in the MEDLINE records to the holdings of those titles in the MELVYL catalog records. In effect the bibliography was made a front-end

to the catalog, yielding the best of both resources (Horres, Starr and Renford 1991; Lynch and Berger 1989).

3. Catalogs record publishers' units (books and periodicals) and not, ordinarily, intellectual or literary units within publishers' units as in example 3

Example 3. The *Catalogue of the Library of the Peabody Institute of the City of Baltimore* (1887) is an example of library catalog in book in the days when libraries printed and distributed their catalog like telephone directories. It contains the following entry:

King, Henry, Bp of Chichester, 1591-1669. *Poems and psalms*. London, 1843. [Call no] 1387.

There is also contains a separate analytical entry for an item within that published book:

Hannah, Rev John, 1818- . Biographical notices of Bp. Henry King. 79 pp. [In] (King, H. Poems and psalms, p. 1)

In my library's catalog there is a record for this book, but there is no mention of John Hannah's biographical notices either as a separate entry under Hannah or as a note in the main entry under Henry King. This is not matter of cataloging principle, since cataloging rules provide for "analytical entries". It is simply too expensive for individual libraries. Bibliographies and other reference works have to be used for discovery instead.

5. Standardization does brings beneficial cost-effective uniformity for everybody. The problem is that nobody is everybody. We all live in our own particular little world. For cultural and language reasons, multiple diverse catalogs to same, one for each group of readers, would be ideal, but very impractical in a paper environment. In a digital environment, however, search term recommender services using specialized bibliographies, computational linguistics, statistical techniques, and mapping related terms across vocabularies can begin to meet that need (Petras 2006; Buckland 2007).

TOO MUCH SYSTEM?

Schrettinger's ideas anticipated the drive for scientific management ("Taylorism") that was very influential in industry and professions in the late nineteenth and early twentieth centuries. Standardization, collaboration, efficiency, and scientific management could be combined to develop systems that would be engines for social progress. This was a view that inspired Melvyl Dewey, Paul Otlet, and so many others (Buckland 2007). But the rise of impersonal, standardized systems can bring a loss of expert personal interpretation and advice. There were occasional protests. Another German librarian, Friedrich Adolf Ebert, who thought Schrettinger did not sufficiently value the role of a scholarly librarian (Jochum 1991), criticized him.

In 1938, Alvin Johnson, a U.S. educator, published *The public library-A people's university*, in which he argued forcefully that the potential of the public library for adult education was being subverted by librarians' excessive attention to maintaining the library system. Johnson denounced "pure librarianship, the impartial custodianship and administration of books" (Johnson 1938, 76) and he complained that librarians' thought that "arranging a lecture program or managing a forum takes time that should be devoted to the administration of the book collections" (Johnson 1938, 48).

CONCLUSION: DESIGN FOR A NETWORKED ENVIRONMENT

Our discussion leads to the following conclusions:

1. Readers want access not verification of ownership.
2. The traditional distinction between catalog and bibliography is obsolete. All bibliographical records should now include a link to a copy of the document represented and, preferably, to the best link for each individual reader.
3. The library "collection" which should include what is available through ownership, license, or open access. This implies

replacing the classic library access, the catalog, with more flexible combinations of bibliographies and locations of accessible copies anywhere. Physical location and ownership are becoming irrelevant for the reader.

4. Dissolving the distinction between catalog and bibliography can help overcome the catalog's limitation to publishers' units. Bibliography is inherently a cumulative process: entries can always be added, corrected, or expanded. For building the corpus of analytical entries only a collaborative, cumulative process can work.

These are shared problems inviting shared solutions. In particular, they suggest designing library systems to be more like the ideal librarian and fuller recognition that in our networked environment the role of the catalog is obsolete and the definition of "the collection" has changed.

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