

The History of Library and Information Science: A Commentary

Author(s): Robert M. Hayes

Source: *The Journal of Library History (1974-1987)*, Vol. 20, No. 2 (Spring, 1985), pp. 173-178

Published by: [University of Texas Press](#)

Stable URL: <http://www.jstor.org/stable/25541596>

Accessed: 16-10-2015 17:06 UTC

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <http://www.jstor.org/page/info/about/policies/terms.jsp>

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.



University of Texas Press is collaborating with JSTOR to digitize, preserve and extend access to *The Journal of Library History (1974-1987)*.

<http://www.jstor.org>

The History of Library and Information Science: A Commentary

Robert M. Hayes

The history of relationships between librarianship and information science can be seen as a recent phenomenon, focused on the application of computers to library operations and services, or as a long-standing phenomenon, reflecting a wide range of issues related to the processing of information. But, while the term “information science” is itself recent and clearly created to reflect efforts to deal with automation, the issues with which it is concerned are far deeper than simply the use of computers; they have been the focus of research for centuries, and librarianship has both affected that research and been affected by it for the same length of time. After all, the library is one of the most successful of society’s information systems, with a long and fruitful history.

It is, therefore, especially appropriate that the *ALA* Library History Round Table has sponsored a meeting on the history of the relationships between these two disciplines and that *JLH* is now publishing the papers presented at it. The purpose of this commentary is to put the three papers into a common perspective and to set a larger framework within which I think they should be viewed.

Hegelian historical dialectics is alive and active in the three papers that serve as the starting point for this commentary. Each of them presents the classical succession—thesis, antithesis, synthesis—with librarianship as the thesis and information science, in one or another interpretation, as the antithesis.

W. Boyd Rayward provides the longest perspective in time, with bibliography and documentation as the chosen interpretation of information science; he shows why they serve as antitheses, and he then reviews the history in which their synthesis with librarianship has developed. Francis Miksa narrows the time frame somewhat, setting up “practical knowledge” as the one of the five categories of knowledge defined by Machlup that can be identified with information science; he argues that the resolution of the dialectical process lies in the recognition that the responsibilities of the library encompass the full range of knowledge, including

but not limited to practical knowledge. H. Curtis Wright focuses on the most narrow time frame—a specific historical context—and presents “automation” as the antithesis to librarianship; he views Shera’s philosophy and approach as the means for synthesis, though one fraught with personal and political conflicts at the time.

These three papers thus view “information science” in three different, though presumably related, ways:

(1) As concerned with the information content of books and documents (in contrast to the concern of librarianship with the books and documents as physical records);

(2) As concerned with practical knowledge, of value for the solution of specific problems (in contrast to the concern with the full range of knowledge that is the province of librarianship);

(3) As concerned with the application of computers and other automated systems (in contrast to the concern of librarianship with intellectual processes as handled by people).

They, therefore, provide complementary views of information science and the relationship it has had to librarianship, illuminating the diverse issues that have had to be resolved in arriving at a synthesis of the two.

In each case, though, the three papers imply, if they don’t actually state, that “information science” is to be identified with the particular perspectives they chose. Since my own definition of information science is substantially different from any of the three, I want to set a perspective both longer in time and broader in scope than the three papers have provided. In doing so, I will try to show how their perspectives fit with mine.

Let me first put the topic in context by defining “information science” as I use the term: “Information science is the study of the means by which organized structures (which we call ‘information systems’) process recorded symbols to meet their defined objectives.” The examples of information systems are limited only by the imagination of the person doing the study. The methodology of study in large part is a function of the choice of system being studied, but in general it will tend to use the techniques of scientific method—data acquisition through experimentation, mathematical model building and testing, and quantitative evaluation.

Simply to sketch out the general concept, the following are among the major threads and historical developments with which I think information science, especially as it has related to librarianship, is concerned:

(1) The library catalog as an information system. The contributions of Panizzi, Jewett, and Lubetzky seem to me to emphasize the primary role of the library as preserver of the record, with the catalog as means of identifying the records held and wanted. Information science is con-

cerned with the study of the processes by which such catalogs are maintained and used.

(2) Science information, as an information system. From the time when users of the British Library who wanted access to the content of books in it, to Billings and his *Current List*, to the bibliographers and documentalists and the indexing and abstracting services, to the “information analysis” centers, the requirements in this area have had a profound effect upon all of the other systems.

(3) The computer as an information system. The contributions of Babbage, Hollerith, Jewett (nephew to the library Jewett), von Neumann, and Wiener have resulted in creation of a system whose only purpose is the processing of recorded symbols. It is thus the very model of a modern information system. I think that historically there has been a recognition of the “library problem” as an application of the computer, and that the library problem has in fact influenced the development of the computer.

(4) Symbolic logic, as an information system. In a real sense, the entire concept of modern logic is the definition of (formal) processes upon recorded symbols to achieve desired objectives (in particular, the reduction of mathematics to logic). The names here are equally well known: de Morgan and Boole, Russell and Whitehead, Goedel and Turing. Each, in principle, was concerned with studying the properties and results of processes on recorded symbols. Their work is embodied in the computer as a physical device and a programmed logical device, but most importantly it provides the theoretical basis for our understanding of the computer. Of course, at its simplest level, symbolic logic is central to the application of computers to library retrieval applications of computers.

(5) Linguistics, as an information system. The concern here is with the variety of languages, both natural and artificial. They include spoken and written languages, languages for description of document content (thesauri, subject authorities, classifications, and word lists), computer programming languages, and the constructs of the logicians and mathematicians.

(6) Communication, as an information system. From the time of Samuel F. B. Morse to that of Shannon, this has both affected and been affected by the other threads.

How, then, does this view of information science relate to those of the three papers? Although the relationship is probably obvious, I would like to put it into historical perspective by going back to nearly 140 years ago to consider what happened to libraries then and since then. In presenting this history, I’m going to simplify and perhaps exaggerate what happened in order to highlight the general trend that has brought us to the point we are at today. Having done that, I’m going to return briefly

to that same point in history—roughly 140 years ago—in order to identify other threads that, taken together, weave the fabric of “library and information science” today.

So let’s go back to 1847–1849, when hearings were held in London by a Royal Commission “Appointed to Inquire into the Constitution and Government of the British Museum.” The issue of primary concern was the performance of Panizzi as librarian of the British Museum. For several years, he had been responsible for the creation and production of the catalog of that library and, for various reasons, had been the subject of criticism for the delays in completion of it and for the content and organization he was putting into it. At the risk of oversimplification and ignoring the evident aspects of politics and conflicts of personalities, the debate in those hearings can be summarized in one question: “Is the role of the library—and thus of the librarian and the catalog, as the principal tool—to provide access to the books in the library or to their content?”

Clearly, both functions are and were important, but each dictates a different form of catalog, a different criterion for organization of it, even different content for the entries included in it. If resources are limited, a choice must be made as to which function is the crucial one. The decision that Panizzi clearly made was that the crucial function served by libraries is to provide access to the books, and that decision has set the tone for libraries ever since. This may seem to reduce the role of the library to that of a storehouse and the role of the librarian to that of a conservator, and such characterizations have been made, with deprecatory tone, by those who see the important function as access to content. But the library indeed offers a vital social service, even if limited to such a mundane role, since if the record is not preserved and if access to it is not provided, it is impossible to provide access to the content. And changing the form of the record doesn’t reduce the importance of the library’s central role; it simply changes the form or medium of the record to be preserved and accessed.

Of course, even in Panizzi’s time, those who wanted access to content simply were not served by the catalog he was creating. They asked for such things as the use of “key words” from titles (Crestadoro being most explicit in doing so), and the use of subject headings and thesauri. The appearance of bibliographers and then documentalists, which Rayward so well describes, was one answer to meeting those needs.

A related problem was the appearance of the scholarly and scientific journal. The obvious value of the journal made preservation and access, the central function of the library, fully as important as it was for monographs, but the problems of access to content were multiplied ten-fold. The library rightly took the economic way out. It cataloged and stored

the journal as though it were a monograph and then depended upon the specialized indexing and abstracting journals for access to content, thus continuing the trend represented by the bibliographers and documentalists.

Even worse in this respect was the flood of documents and reports that appeared following the Second World War. As publications they were hardly of the same degree of importance as monographs and journals, so the library faced the question of whether they should even be preserved. Furthermore, they represent all of the problems of the journal without the neat solution of being bindable in the form of a book. They are hardly worth the cost of descriptive cataloging, and to subject catalog them would be economic insanity. And yet, they have obvious even if ephemeral value, especially in areas where the latest results are the ones of most immediate practical value.

As Miksa so well describes, the emphasis on “practical knowledge” that arises from these documents and reports has characterized much of the focus of persons developing modern information systems. The reasons are obvious. In order to justify the costs involved in dealing with them, there must be demonstrable value, either economic or instrumental.

Beyond that, however, the sheer magnitude of the flood of information in every form—books, journals, documents, and reports—when combined with the necessity for access to content, made it imperative that there be automated means for processing. It was this that created a situation in which computer systems for publication and then, later, for storage and retrieval were needed. Wright’s review of one specific context is very illuminating of the problems involved. As one who observed the Shera-Perry-Kent activities from the outside, I found the anecdotal description of the picture from the inside to be especially fascinating. It confirms much of what I conjectured about both the personalities and the activities.

The significant point, in terms of the identification of information science, is that the application of the computer requires formalization of the processes it is to perform. The efforts of Perry and Kent were of great value in clarifying some of the processes, especially of interrelationships among subjects and documents. It must be said, though, I think in agreement with Wright’s presentation of Shera’s views, that those efforts were neither the answer to the problem nor even especially good solutions; they were simply part of a general and widespread effort to formalize the processes involved in providing economic access to the content of books, journals, documents, and reports.

In summary, I think the relationship of the three papers and their respective dialectical examples to this general picture is evident. Rayward

has shown the importance with which access to content was viewed. Wright has provided a look into the effort to develop computer applications for both access to content and economic operation. And Miksa has highlighted the economic aspects that have led to a focus on practical knowledge. In each case, they have related this to librarianship and its growth and change. My aim has been to put them into common perspective.

However, I do not want to end with simply that. The problem is that doing so would leave "information science" as simply the result of a specific set of needs and events. In my view it is far more than that, and I would like to set the broader context within which I view the three papers. As I have said, the range of information systems is far greater than is implied by the foci of the three papers, even as it relates to librarianship.

The important point, I think, is that while we may have created the term "information science" only recently and with focus perhaps on the issues raised by these papers, the definition I've given above has a long and distinguished history that involves many other issues.

It is of some interest to note that at the same time Panizzi was setting the basis for modern librarianship, Charles Babbage was doing the same for the modern computer business; George Boole and Augustus de Morgan for modern logic; and Samuel Morse for modern communication systems. These are all information systems of concern to information science as well as providing the technical tools for analysis, design, and evaluation of every kind of information system. As I see it, information science was alive and active, even though not named as such, at least a century and a half ago. Even today, while the name "information science" may have grown out of the information systems of specific importance to libraries, science information, and computer applications, the scope of its concerns is far wider.