
Educational Requirements for a Library-Oriented Career in Information Management

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ABSTRACT

A NUMBER OF FACTORS have converged to compel a substantial reassessment of the educational requirements for library-oriented careers in information management. These factors include: the role of technology and the convergence of domains that it has produced, the growth of special library and corporate employment, the growth of information industry employment, and the increased mobility of information professionals. The convergence phenomenon has eroded the boundaries between library and information science, and also the boundaries with business education; communications, journalism, and media; and computer science. One of the major consequences is a very dramatic, and, in many quarters, difficult to accept, polarity reversal for the field—i.e., a change in value systems in which a field that was perceived and perceived itself as primarily a service profession is now very much a part of the entrepreneurial market economy. The educational ramifications of these changes are considerable; there needs to be more orientation toward the corporate and information industry constituency; more emphasis on data and information structuring and the design of information systems; development of a more entrepreneurial and market orientation; development of a more international orientation; and the development of a core component that is general to the information professions and not specific to librarianship, in recognition of the great mobility among information professionals.

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LIBRARY TRENDS, Vol. 42, No. 2, Fall 1993, pp. 277-89

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INTRODUCTION

The central thesis of this article is that the educational requirements for a library-oriented career in information management have changed dramatically in the last decade, not only in the for-profit environment but across the board. This change has, however, been driven to a large degree by developments in the for-profit domain. Library managers and operators can no longer assume, as they have previously, that knowledge of how to operate information systems constitutes virtually the entirety of their required skill set. Now they must know how to create such systems as well. This change in requirements derives from:

- an increasing proportion of library-oriented jobs being created in the corporate and for-profit environment, where creating information systems for the organization is a fundamental component of the job function;
- the increasing integration of academic, then public, and finally school libraries into networks is, in fact, the beginning of an entirely new paradigm of librarianship—the era of library service as access to the network and the end of the era of the library as a location. This requires that we build a whole new generation of systems;
- the beginning of the transition from meta-information in electronic form (the “database” that informed one that there was a print-on-paper article on the topic) to the information itself, full text, in electronic form, and increasingly image as well as text data; and
- an increasing fluidity and flexibility in career paths.

The consequence of these factors is that education aimed at the design and creation of information systems is now an integral part of the education for librarianship as it never was before.

For a number of converging reasons, the basic educational requirements for a library-oriented career in information management have expanded dramatically. The change can be summarized simply—it is no longer sufficient for such education to focus on the operation of libraries and the provision of information services; it is now requisite that there also be a focus on the design and creation of information systems. This is a dramatic change. Furthermore, that change represents far more than just a major increase in scope; it also represents a culture change, a culture change so profound that it can be described as a true polarity reversal—a polarity reversal from a service orientation to an orientation that is at least as much entrepreneurial as it is service oriented.

THE ROLE OF TECHNOLOGY

The developments driving this change are several. First, and ultimately the most important, is that the transition from print-on-

paper to electronic information tools and systems has fundamentally changed what librarians do. In the print-on-paper world, librarians administered libraries, cataloged books, and provided public service. Library education had to prepare librarians for those functions. Their world was relatively static, and it was one with great duplication of effort, the same item being cataloged nearly simultaneously at many different sites.

With electronic information systems, that situation has changed. Bibliographic utilities have reduced the need for that duplicative cataloging, and librarians' efforts have therefore been able to shift more toward providing access to, and the creation of, new systems.

A more fundamental component of that change from print-on-paper to electronic information systems is that, in the print-on-paper world, the structure and design of an information system, typically a book, was relatively straightforward; one had merely to be exposed to it and one knew about it, tables of contents, back of the book indexes, etc. In "library school," one learned the subtleties of that structure and the rules and techniques of cataloging and indexing.

Now the domain of electronic information systems is both far more complex and extraordinarily more dynamic. How one constructs a CD-ROM database product is a considerably more complex undertaking than designing and planning a book. There are numerous options in terms of data entry or data conversion, data structuring, search engines, and user interface options, for example, plus numerous vendors whose services overlap, complement, and compete with each other in a far more complex environment than that of printing and binding. In addition, those options and those possibilities are all in rapid flux, and the rate of change is only accelerating.

This complexity and this stunning rate of change has important ramifications for education. We can only dimly predict what we will be educating people to cope with only a relatively short period beyond graduation. We are now entering into a third stage of information systems development, a stage which promises to be even more exciting with far more rapid change than what we have been used to for the last twenty years in stage two (Koenig, 1992). The one thing that we can say for certain is that there will be dramatic change. Stage three, characterized by experimental growth of communication capability, has the potential to radically reshape the world of information services to a degree far beyond even the fairly dramatic—at least to our eyes now—changes wrought in stage two by online databases and CD-ROM. The obvious consequence is that we must educate students broadly and conceptually for information about which we can only guess its shape.

THE GROWTH OF SPECIAL LIBRARY AND CORPORATE EMPLOYMENT

One of the major employment changes has been the increase in the proportion of library education program graduates taking jobs in "special," typically corporate, libraries. Koenig (1983) pointed out that this change was marked, and made the intriguing discovery that this change correlated quite significantly with the perceived quality of library education programs—that is, the more highly rated the program, the greater had been the shift toward special library employment. He noted further that the shift was independent of the urban or nonurban location of the program.

A major distinguishing characteristic of the special or corporate library is that it typically deals with information internal to or created by the organization it supports. The typical "traditional" library—public, academic, or school—is centrally concerned with organizing information that is created externally. To do that, it either purchases tools (for example, indexes) or catalogs items in a standard format. The special or corporate library by contrast is often centrally, or at least very much, concerned with organizing information created by the organization, and the format is often very specific. Pfizer Pharmaceuticals, for example, may create a database and a data structure for beta-lactam and cephalosporin antibiotics that is unique and is used nowhere else, while Shearson-Lehman may create a similarly unique database for mergers and acquisitions. Even when the information is not unique—for example, external patent information relating to beta-lactam and cephalosporin antibiotics in the Pfizer example—the level of detail that may be needed and appropriate for that organization's use may often exceed that which is available from conventional information services and thus requires that an expanded and enriched database be created within the organization.

The consequence of that characteristic is that special or corporate libraries must frequently create information systems to handle that internal data or to enrich or expand access to external data. Precisely because it frequently is internal data which is often unique to the organization, there is no ready made information service that can be purchased; an information system must be created. This, of course, requires people who can create information systems. At the very least, they must be able to choose among various software packages and build an information system based upon one of them. To do that, one must understand the capabilities and limitations of the different systems. The best way to be able to do that is to have a thorough grounding in information systems technology, particularly a knowledge of the various methodologies for structuring data in an

electronic environment, since that sets the constraints on the performance of the system.

Furthermore, it is increasingly the case that academic librarians create information systems rather than just use them. In the case of academic libraries, there is a new movement calling for return to the academic world of the distribution of the information created by that world, rather than letting commercial service monopolize that distribution role, and, some would say, parasitize the academic community.

THE GROWTH OF INFORMATION INDUSTRY EMPLOYMENT

A parallel development is the increasing role of library and information science education in preparing for employment in the information industry. In the era of print-on-paper, the world of publishing, as the information industry was then known, required no formal training or education. A good belles-lettres degree was all that was expected. Books or journals were items with which all were familiar, and the parameters and economics of their production could be quickly learned. With current and future information technology, that is no longer the case. Putting together a CD-ROM product is not easy or straightforward. There are numerous decisions to be made about vendors, data conversion, search engines, and display formats, some of which require, and all of which are made easier by, a knowledge of information technology and data design. Furthermore, the technology is changing rapidly, and the new technology and its applications and capabilities can be understood and appreciated far more rapidly by those who also possess a solid grounding in the area of information technology.

The consequence of these developments is that the traditional route of entry into what has become the information industry is no longer very satisfactory. The products of schools of library and information science are far better educated and trained to step into jobs where they will have to be dealing with the sorts of issues hinted at earlier.

The industry has discovered the utility of hiring graduates of schools of library and information science. This education has stretched, not without some complaint from the traditionalists, to accommodate this new role of serving as a special purpose graduate school of business to the information industry. The stretch, however, has not in fact been that large. What is needed for information industry jobs, in fact, overlaps greatly with what is needed in modern libraries and information centers, particularly libraries and information centers in the corporate world.

One result of this development is to impel library and information science education toward a more international orientation, for the information industry is inherently international, which in turn derives from the fact that information, the commodity, is inherently international. With conventional manufactured economic goods, there is a trade-off point at which it is cheaper to build—e.g., automobiles—locally than it is to pay the costs of shipping them. With information goods, the cost of creation is high (what the publishing industry refers to as the “first copy cost”), and the cost of duplication and distribution is very modest, almost trivial by comparison. Once one has a *Chemical Abstracts* database in Columbus, Ohio, it is sold worldwide; it makes no sense (economically speaking) to duplicate it in Europe or Japan. Similarly, the Derwent database in the United Kingdom or the Beilstein database in Germany are sold internationally and not duplicated elsewhere. There is a spectrum of economic goods, from low value and high shipping/transmission costs per unit (such as cement) at one end, to high value and low shipping/transmission costs (such as microelectronic devices and printed information products). As information products move increasingly from print-on-paper to electronic media, they are moving even more to the latter end of the spectrum, indeed even extending that end of the spectrum.

At the same time, the world economy is itself becoming both far more international and more information oriented. This in turn creates far more interest in information and information products that are not merely local or regional in their coverage but international.

The consequence of these trends is that the information industry seeks candidates who not only have the requisite technical and operational skills, but who also have the language skills, the interpersonal and communications skills, and the breadth of background and knowledge that allows them to operate effectively in the new international marketplace. Library and information science education programs must consciously prepare themselves to educate students to work in that marketplace.

THE MOBILITY OF INFORMATION PROFESSIONALS

A related development is that of the increased job mobility within the library and information field. Traditionally, library careers were somewhat constricted. Librarians tended to have a career within their particular specialty area. This was particularly true and remains so to a considerable degree within academic librarianship (Koenig & Safford, 1984). However, the growth of both corporate librarianship and the information industry, areas which are very much interwoven in terms of career paths, has brought an unprecedented flexibility to library careers.

In addition, the electronic information age has changed the nature of traditional librarianship by moving library and information operations to the "buy" end of the "create versus buy" spectrum. A fundamental decision in running any enterprise is what to create yourself and what to buy—e.g., if you are a manufacturer of window air conditioners, do you make your own compressors or do you buy them?

The era of electronic information has moved traditional libraries and information services increasingly to the buy end of the spectrum. The first phase of the shift was buying central cataloging from an agency such as OCLC rather than doing (making) it oneself. The second phase was online databases, and the third phase is represented by the shift from collection-based to access-based services. Of course, libraries always bought books and services, but librarianship and publishing were perceived to be two quite separate fields and quite separate career paths. Now, however, with the development and extension of the publishing industry to converge with computation, networks, and other players into the information industry, it is increasingly the case that those entering librarianship and those entering the information industry share common training and common friendships. Furthermore, that shift from "create to buy" has been accompanied by, or, perhaps more accurately, has been enabled by the development of a host of library agencies from national and international agencies (such as OCLC) to state and within-state library networks of various kinds. These agencies are developed and staffed principally by librarians, yet their function and their operation is very similar to that of components of the information industry. Indeed, the distinction between what is and what should be the functions of not-for-profit agencies versus what should be the functions of for-profit information organizations is murky, problematical, and contentious. The consequence is that there is no longer an information world with just two very separate domains—libraries and publishing—the new world is much richer and far more complex, and the domains are far less clearly delineated. Furthermore, the new domain of the library agency represents more than simply the addition of a new domain; it is also a bridge and a migration route between the old domains.

Thus mobility within the field has increased substantially. In fact, not only has mobility increased in terms of changing domains during one's career path, it has also increased in terms of initial job selection. White and Mort (1990) pointed out that nearly half (46 percent) of recent graduates of library and information science programs took their first jobs in areas other than what they thought they were preparing for during their course work. This is a surprising

statistic. It is hard to imagine such a high figure in most other fields. Coupling this statistic with Griffiths and King's (1986) data on job changes indicates that, within a half a dozen years of graduation, more than two out of three graduates of schools of library and information science will have worked in an area substantially different from what they thought they were focusing on in their course work.

CONVERGENCE AND THE CRUMBLING OF BOUNDARIES

Another phenomenon referred to earlier is the convergence of fields and disciplines relating to library and information work and the crumbling of the boundaries between them.

LIS and Business Education

As described earlier, schools of library and information science have become, through default, special purpose business schools for the information industry. In addition, however, business schools are themselves becoming far more conscious of the need to address the management of information and information technology. For a spate of reasons, which are too lengthy to review here (but which are well reviewed by Broadbent & Koenig [1988]), the 1980s saw a dramatic burgeoning of interest in information management (a fivefold increase in five years as indicated by articles in the *Harvard Business Review* and the *Sloan Management Review* [cited in Broadbent & Koenig, 1988]). More and more business schools are initiating programs in information management. The area is ripe for collaboration between schools of library and information science and graduate schools of business. In some cases—for example, Rosary College—that has already happened; at other places, like Western Ontario, it is in the works.

There is also another dimension to this convergence—a technology-driven dimension. As presented by Willner (1991), what a corporate library employer is looking for in new hires has changed and the essence of that change is that the employer now looks for someone not only with technical and professional skills but also with managerial skills. A decade ago, he points out, salary accounted for most of a corporate library's budget. Now, in many libraries, salary is a comparatively small proportion of the budget; the major component is external services and databases. In the case of Shearson-Lehman, he points out, each library employee is, on average, deploying several hundred thousand dollars of the company's resources each year. Those new hires are managing and deploying considerable resources, whether or not they ever thought of themselves as training for a management job.

LIS and Communications, Journalism, and Media

Historically, there has been a logical distinction among the cluster of library science, information science, and information retrieval, and the cluster of communication, journalism, and media. The latter cluster was interested in systems information in which the user was comparatively passive. For example, we all get newspapers delivered in the morning and some of us may have looked at the business section before the sports section, and others may have reversed the order, but our degree of involvement was comparatively minor. In the library/information retrieval cluster, by contrast, the users come to the library and search the card catalog or sit at a microcomputer and do a database search. The user was comparatively active. Now, however, with a device on one's desk, one can be running a profile against a newswire one moment, reading e-mail the next, and then commence a database search. Of those activities, which are library and information science and which are communication or media? The distinction has grown very fuzzy and porous. Indeed, at some institutions (Rutgers and Kentucky, for example), these disciplines have been folded into one school of communication, information, and library studies.

Library and Information Science and Computer Science

As information systems have been automated, there has, of course, been great interaction with computer systems. Furthermore, since computer systems are information handling systems pure and simple, the overlap, in principle, with library and information science is obvious. That overlap, long apparent to those in the "information science" community, is now becoming more apparent to the "computer science" community as well.

It is becoming increasingly recognized in the computer science community that a very major strand in the development of computing and software technology has been to separate and distinguish data from procedure or process (Abbott, 1987). In early programming practice, data were buried and often unrecognized as data in the procedural code. Most of the major developments in software in the 1960s from table-driven software to expert systems, and much of artificial intelligence in the 1980s and 1990s, can now be recognized as steps in structuring data independent from procedure. Thus the structuring of data, the representation of knowledge, is coming to be recognized as increasingly central to computer science, and the convergence of interest with library and information science is clear.

THE POLARITY REVERSAL

The consequences of the four trends discussed earlier are:

- an increase in special library and corporate employment;
- an increase in information industry employment;

- an increase in job mobility; and
- the loss of clear demarcation between fields and disciplines

These are more than just a dramatic increase in the scope and the boundaries of that field. It is, in fact, a true polarity reversal of the value system of much of the field of library and information science.

Librarianship was justifiably proud of its service orientation. It defined itself to a degree by that orientation and took pride in the fact that it was not a business school. Now library schools are being required by the changes in employment opportunities to not only serve the traditional community, but to serve as a special purpose business school as well. For many, this is a bitter pill to swallow. In one case, it would not be much of an exaggeration to say that one school of library and information science even chose to treat it as a suicide pill (Haywood, 1991).

The author was made personally aware of how dramatic that change has been when, a few years ago, he served on an eight member search committee for the dean of the School of Library Service at Columbia University. The experience can perhaps best be described as closely akin to serving on a search committee for the dean of a divinity school—but a completely schizophrenic search committee in which half of the members thought they were looking for the dean of an aggressively nondenominational divinity school—e.g., Yale, and whose important selection criteria were a candidate's commitment to open scholarly inquiry and the marketplace of ideas, the candidate's own research and scholarly merit, and the candidate's administrative and fund-raising skills—and where the denomination of the candidate, whether Congregationalist, or Shiite, or Dominican, or Reformed was largely immaterial. By contrast, the other half of the members of the search committee thought that they were looking for the dean of a rigidly sectarian divinity school—perhaps one like Oral Roberts University—and that the candidacy of no one but a demonstrated true believing member of that sect could be entertained. A candidate with a background in the information industry was absolute anathema to that half of the committee.

Indeed, the demise of the School of Library Science at Columbia can be quite simply described as the conflict between a university administration who had given the school a mandate to become a Yale and a tenured faculty who were committed to retaining the school as the Oral Roberts of schools of library and information science, supported, or at least not challenged, by their dean.

The point made is that it is proving to be very difficult to change the cultures of schools of library and information science—so difficult that the School of Library Science of Columbia committed what

Haywood (1991, p. 48) described as “communal Hari-Kari” rather than adapt to that polarity reversal. The senior faculty preferred to fly the old flag of “service orientation” in solitary splendor on the masthead and go down with the ship rather than run up alongside it the new flag of “entrepreneurship and the international marketplace” and be assured of smooth sailing.

RAMIFICATIONS

The ramifications for library and information science education are generally rather clear, but they are not so easily implemented—as the case of the School of Library Science at Columbia University illustrates.

Library and information science education needs to:

- become more oriented toward its corporate information center and its information industry constituency;
- emphasize data and information structuring and the design of information systems;
- develop a more entrepreneurial and market orientation;
- develop a more international orientation; and
- recognize the great mobility among information professionals, and design curricula that have a core component that is general to the information professions and not specific to librarianship.

The changes required are, however, likely to be more profound than this list implies. The difficulties caused by the polarity reversal of the field have already been discussed. There is no point repeating what has already been stated, but this issue is visceral and deep, very difficult to deal with, and the difficulties it raises color all of the discussion in this section. Its importance should not be underestimated.

The convergence phenomenon implies that, at the very least, schools of library and information science will need to be building joint and interdisciplinary programs with other programs, departments, and schools. This is not easy to accomplish in an academic environment; it requires cooperation and the sharing of power. Furthermore, it calls into question a basic and long-standing assumption of library education—the stand-alone “library school.” Library science has long been very concerned about its image and acceptance as a profession, and to bolster that image and acceptance it has very consciously adapted a pattern of education for the profession that mimicked that of the more unambiguously recognized professions—medicine and law. That mimicry had two key components: library science education would be at the graduate level only and that education would be purveyed in a discipline-specific

stand-alone school. Haywood (1991, p. 35), in his study of U.K. and U.S. library education programs, noted the U.S. penchant for stand-alone schools as contrasted with the United Kingdom. He commented on the "dichotomy" this creates between the desire for stand-alone status versus the fear of isolation and its consequences and the ability to develop innovative new programs and curricula.

Joint and interdisciplinary programs can and are seen as a threat to that model. The more such programs there are, the more obvious becomes the question "Why not place those various programs in one umbrella organization that awards a number of degrees, including, but hardly limited to, the American Library Association-accredited degree in library and information science?" The only logical answer is "why not indeed." As mentioned earlier, this has already happened at Rutgers and Kentucky, and it is increasingly being discussed at other institutions. At Syracuse University, for example, there has been serious discussion about merging the School of Information Studies with the School of Business Administration. Given the options provided by the degrees of overlap and convergence, there is likely to be no one standard solution. What shape the larger organization takes will be largely a function of the potential partners and the peculiar campus politics of each parent organization. It is likely, however, that the day of the stand-alone library school or school of library and information science is numbered. This is for many library and information science faculty members a very threatening and unwelcome development. It implies at the very least a sharing of power, and since library and information science faculties are not very large (the modal and mean faculty sizes are in the range from seven to nine), it typically will mean sharing a much larger pond already populated with larger frogs. To many, this is an unappetizing scenario to be avoided at all costs.

These necessary and largely unavoidable changes have ramifications for, among other things, accreditation. The old standards, or at least the interpretation of them, actively discouraged collaboration and joint programs. The new standards which encourage such initiatives are a major step in the right direction. Now we need to set up an implementation procedure which, in fact, does encourage them.

We cannot avoid the coming convergence; we must adapt to it. The best way to adapt to it—best both in terms of serving our constituencies well and best in terms of the self interest of the survival of library and information science programs, albeit within a larger pond—is to undertake the steps discussed earlier and to develop joint

programs with other players in the information area. The best defense is often a good offense. Better to occupy the terrain jointly than to be dispossessed or shut out entirely.

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