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OPINION PAPER: EDUCATION ISSUES

CUTTING THE GORDIAN KNOT

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Abstract—This paper argues that (a) the term "library science" is an oxymoron and (b) the physicalist paradigm is bankrupt. Evidence suggests that the growing tensions between the two cultures of North America library and information science education have become intolerable. The "information access" model is proposed as a vehicle for unification and integration, but its limitations are also acknowledged. An action agenda, centered on the idea of conceptual outsourcing and a commitment to interdisciplinary research, is adumbrated.

JOINED AT THE LIP

It does not exactly trip off the tongue. In fact, "library and information science" is neither a euphonious nor an entirely honest label. First, there is no such thing as library science: it is a misnomer. The correct term is librarianship, a professional activity for which a period of apprenticeship and solid tutelage may well be a reasonable expectation. It is revealing that few, if any, countries around the world have adopted the term "library science". The United States stands apart. Information science, on the other hand, denotes a field of scholarly inquiry: an early 1960s conference on the subject at the Georgia Institute of Technology defined it as the "science that investigates the properties and behaviors of information, the forces governing the flow of information, and the means of processing information for optimum accessibility and usability" (quoted in Farkas-Conn, 1990, p. 199). This definition has stood the test of time. Second, the set of theoretical concerns that undergirds the praxis of librarianship can be subsumed legitimately by the rubric "information science." As Vakkari (1994, p. 2) says: "Information science conceptually contains the necessary elements for the universe of discourse of our field, including librarianship." Third, library science's pretensions to disciplinary status, predicted as they are on a particular physical institution and stewardship of a particular class of materials, are singularly difficult to sustain, a point drilled home by Wersig (1992, p. 202):

> "There is not very much proof that specific *kinds of organizations* provide a sound basis for a scientific or academic discipline. As long as there are no disciplines like "hospital science" or "jailhouse science" in existence something like "library science" is not very convincing."

Library and information science is certainly not a marriage made in heaven. The level of mutual suspicion and intolerance is revealed in the literature of the field and in virtually all public fora where proponents of both world views collide. Today, in North America, the contributions of the library science partner are defined increasingly in terms of professional values and fuzzy philosophical ideals rather than theory building and rigorous research. While information science seeks to conform to academic norms (such as value neutrality), library science prefers the path of social activism and ideological engagement. It seems that the gulf between the two cultures is no longer bridgeable, and the time may have come to file for divorce on the basis of irreconcilable differences.

THE PHYSICALIST PARADIGM

The shedding of the "L-word" from the titles of so many LIS schools, symbolic or imitative though some of these deletions may be, is a clear indication of mounting dissatisfaction with

what the label connotes. More specifically, it highlights the limitations of the "library as a social institution" paradigm, the internal logic of which is skewered by the fact that there is little basis to claims that the library is one of the most important institutions in the process of social and cultural change (Miksa, 1992, p. 229). If nothing else, divorce might finally end the internecine battling that has become a well-documented way of life in many LIS programs, symposia and listservs, with all the negative externalities implied thereby.

Whatever the nominal (*sic*) shortcomings of information science, this putative (pre-paradigmatic?) discipline does at least attempt to fashion theories, model reality, probe for generalizations, predict behaviors and outcomes, and build systematically on insights developed through both basic and applied research. Information science is, of course, much more than Shannon's Law, or the principles of online information retrieval, or the body of quantitative techniques that defines informetrics, or even the sum of these three. It is an elastic and eclectic field, one that sources ideas from a range of cognate domains (laundry lists are commonplace in the professional/scholarly literature) in the process muddying the boundaries but also enriching the topsoil.

Nonetheless, there is demonstrable evidence of intellectual growth and maturation. As Roberts (1995) observes:

> "Information science is beginning to be recognized as an independent field, and not a step child of computing, as computing was once a step child of mathematics. As our understanding of the science of information grows, previous specialties, such as librarianship, will be swept under its theoretical umbrella."

Take the case of information retrieval, an obvious, yet credible, example of how conceptual advances have impacted on real-world information systems design and use. Following four decades of cumulating research, embodied in a substantial peer-reviewed literature, the law of diminishing returns is kicking into play as we approach the performance threshold of statistically-based IR techniques. But fresh perspectives are being brought to bear on old problems as the ongoing debate on the merits and limitations of the cognitive viewpoint (e.g. Ingwersen, 1992) and methodological advances in connectionist models (e.g. Doszkocs *et al.*, 1990) illustrate.

The information science community should continue to seek fresh inspiration, reconceptualize research problems, and acquire new methodological skills from such areas as cognitive psychology, computer science, communications, and even cultural anthropology. A good example of the potential for interaction, in this instance between information science and computer science, is provided by the proceedings of the National Science Foundation's (1993, p. 22) meeting on *Educating the next generation of information specialists*. The proposed framework for academic programs in informatics (a quintessentially European term which, like telematics, has yet to take root in the North American context) created at this meeting includes among its core such topic areas as information storage and retrieval, human computer interaction, data management, knowledge engineering, computer systems, telecommunications and networking, parts or all of which feature today in our more forward-looking information science curricula. As it happens, the idea of disciplinary interaction combined with conceptual outsourcing maps nicely onto Wersig's enlightened view of information science as a new or postmodern science.

AN ACCOMMODATING MODEL

Wersig builds his case for a novel organizational scheme around the idea of "inter-concepts", which function "like magnets or attractors, sucking the focus-oriented materials out of the disciplines and restructuring them within the information scientific framework." (Wersig, 1991, p. 215). The long-term viability of information science may well depend on our ability to operationalize the "inter-concept" idea. It is no longer simply a question of interacting with other disciplines on an occasional or dilettantish basis: the future of information science research will be contingent on the forging of formal, or quasi formal, and sustainable links with researchers and scholars in other fields (not least our first cousins in information management and

information systems), and this, in turn, will have important consequences for faculty recruitment and retention practices.

Fifteen years ago, Eco (1978, p. 83) concluded "that semiotics, more than a science, is an interdisciplinary approach." We could do a lot worse than replace "semiotics" with "information science" in this quotation. The distinction between multi- and inter-disciplinary is important here. As Leydesdorff (1994, p. 101) notes in another context: "The holistic appeal of interdisciplinarity squeezes spaces of variance together with an appeal to one single object of analysis: the divisive approach of multi-disciplinarity does not fill the holes, since the disciplinary borderlines are reified." By treating information science as an inter-disciplinary endeavor, there is greater probability of fostering intellectual integration, and more chance of, if not quite a grand unifying theory, at least an "axiomatic framework" (Leydesdorff, 1994, p. 102) emerging.

Divorce need not happen, but if a fruitful and harmonious marriage is to ensue in the upper reaches of the academy, then at a minimum we are going to have to reappraise what is taught under the rubric of library science—how, by whom, and to what end. Were that goal to be realized *and* were there to be a moratorium on cant and catechizing, then a *rapprochement* between the "I-word" and the "L-word" *might* just be on the cards. But any coming together will necessarily require that the logical dominance of the "I-word" is finally and fully recognized. Perhaps that was what Saracevic (1982, p. 32) had in mind when, more than a decade ago, he called for an "integrated approach to information science education." After all, librarianship is only one domain in which information handling skills are deployed; one test site among many where information theory building can be undertaken; one career track among many available to aspiring information professionals. In the age of virtual libraries and the digital diaspora, the vocational tail cannot continue to wag the disciplinary dog.

Miksa (1992, p. 243) argues that we need "a more essential approach to what is involved in the work of the field, one that conceptualizes the process in a more thoroughgoing but unitary manner." If this integration is to happen, it will only do so in a school/department that has a critical mass of faculty, a commitment to rigorous research, and a predisposition to catholicity—an academic ambience I have elsewhere labeled "broad church" (Cronin, 1992, p. 199). Short-term economics aside, there is a pretty solid academic justification for eliminating librarianship programs from major research universities and locating them in vocational education institutions (trade schools, in effect), leaving information science to establish, once and for all, its credentials as a discipline worthy of a place at the top table—whether alone or in consort with computer science, telecommunications, or some other potentially suitable partner. The head, if not the heart, calls for bifurcation.

CRAFTING CURRICULA

A curriculum is the operationalization of a discipline's knowledge base and value system. As such, it is the single most meaningful statement of an academic tribe's intellectual *raison d'être*. Despite commonality of content in certain sub-fields, and despite, in many instances, similarly worded mission statements, our curricula reveal the ways in, and extent to, which we diverge in our interpretations of the core and pith of library and information science. If anything, the differences are magnified when we begin to explore the covert curriculum, that is to say, the implicit values, socialization processes, etc., which infuse the formal pedagogic effort.

Curricula are socially constructed and bounded. They reflect the backgrounds, capabilities and beliefs of the faculty and others who were involved in the design and implementation processes; and they also bear the stamp of their parent institution in myriad subtle ways. Cultural relativism is an important consideration in any discussion of curriculum development, as even a cursory examination of the many diverse LIS curricula in North America should make clear. There is no "right stuff" in an absolute sense; "rightness" is locally negotiated, and exists largely in the eye of the beholder (and also, for better or worse, in the eye of accrediting bodies).

This absence of *dirigisme* in the North American higher education system creates the

conditions for experimentation and sustained innovation in a curricular sense. It also, in part, explains why model curricula, however intelligently conceived they may be, are unlikely to be adopted widely in what is a highly contested and deregulated marketplace, though that has not deterred the ACM (Association for Computing Machinery) and the IEEE (Institute of Electrical and Electronics Engineers) from proposing model curricula for undergraduate education in computer science. In the LIS field, the 'common core' remains about as elusive as the Holy Grail, though the quest has begun afresh thanks to an infusion of funding from the Kellogg Foundation (*Chronicle of Higher Education*, 1994). There remains, however, a marked lack of unanimity, both within and among schools, as to which elements constitute an undisputed core. A more productive tack may, therefore, be to ask what is the irreducible essence of the field, the one issue set or problem domain that both defines what we do in a fundamental sense *and* differentiates us from other academic tribes.

ACCESS AS AXIOM

An answer to my question, both in terms of theory formation and *praxis*, might be "information access", broadly interpreted. At first sight, much of what we do seems to radiate from this kernel concept, and no other discipline has yet laid claim to an identical anchor concept, though some in their teaching and research abut the area. It could conceivably be the maypole around which all of us would dance, even if we were to favor different steps and tempi.

"Information access" is a *portmanteau* term that connotes intellectual, physical, social, economic, and spatial/temporal access. Classically, the field's foundations have lain in the area of **intellectual access** (parking and marking, to use the demotic), though there are still weak or underdeveloped spots (Milstead, 1994). If we are to strengthen the base, then we shall have to draw more imaginatively upon ideas from semiotics, linguistics, and cognitive science. Our ability to structure and taxonomize information in ways that ensure generally acceptable levels of retrieval sets us apart from most other academic tribes, though some computer scientists and biologists might take issue with such a statement. We need, however, to enhance our classification and retrieval tools to deal with massive, distributed databases containing not only text, but also images (fixed, moving, and three dimensional), numerical data, and sound configured and commingled in novel ways.

Access also implies **physical access** to information, which embraces the principles and practices of institutionally-defined librarianship, archival work, and records management (e.g. library design, physical organization of collections, retention scheduling, remote storage of materials), but while this sub-field has been important historically within the LIS curriculum, it makes little if any sense to predicate future curricula on an institution of any kind, let alone one whose role and relevance will at the very least undergo major transformation in out lifetimes. However, it could also be argued that physical access entails the design of systems which mediate effectively between users and information resources (the domain of Human–Computer Interaction) and here we need to draw upon research and applied skills (e.g. design of useability studies) from such areas as cognitive ergonomics (Howell, 1994). We also need to deploy more penetrating tools and methodologies to analyze user behavior, which means acquiring proven expertise in the area of cognitive psychology, and moving beyond the well-intentioned amateurism which characterizes much of our current effort in this area.

Information access in not simply a function of the intellectual or physical technologies that we make available, directly or indirectly, to our various publics. The ways in which information systems and services are constructed in a literal sense can either foster or inhibit use, as can the rules, policies or procedures which grant access rights to different individuals or groups under different circumstances at different times. **Social access** implies the study of the local conditions (transparancy vs opacity), instruments (password allocation, opening hours) and the wider national and global public policy issues (intellectual property, censorship in cyberspace) that shape and give character to the overall information environment. Although the LIS field sometimes sees itself as a pretender to this subject area, the main research thrusts currently come from a wide variety of other academic groups (e.g. international relations, law, tele-

communications, journalism). We may have the word "information" in the title of our field and in the names of most of our academic programs, but we certainly do not have a prime mover mónopoly on issues relating to "information policy".

Irrespective of the quantity and quality of information in circulation, access will be influenced by a complex of macro and micro-level economic factors. In the context of the LIS curriculum, **economic access** requires that we address, for example, traditional neo-classical and post-Fordist assumptions about the nature of information. The role of information in the national and global economies, the growth of the knowledge worker population, the structural dynamics of the global information industry, and developments pertaining to intellectual property rights in an era of "formless data" (Negroponte, 1995, p. 61) make it essential that we articulate research and teaching links with social demographers, organizational theorists, scholars expert in copyright and related matters, and the growing band of mainstream academic economists interested in the economics of information.

One of the major challenges facing the LIS field is figuring out how to ensure access to information across space and time. The advent of digital technologies has crystallized thinking relating to the capture, migration and preservation of brittle or otherwise potentially perishable materials. **Spatial/temporal access** thus deals with all the policy, financial, and technological instruments which create sustainable access, not only to local and current materials, but to materials from all historical periods, irrespective of the medium/place in which they were created and/or in which they are presently stored. As we move through a period of hybridization towards a distributed digital information future, the challenges facing the field will call for more technically-grounded research into the dynamics of electronic communication, collaboration, and the spatial flow of information.

THE REIFICATION TRAP

The "information access" model is superficially attractive for a number of reasons, but especially because it breaks the spell that specialization has cast over curriculum planning in the LIS field for so long (McClure & Hert, 1991). Instead of expecting the curriculum to expand to accommodate every conceivable specialization (the much favored *smörgåsbord* model), the "information access" approach begins with a generic template, and builds up from there. The question of which specializations, tracks, or courses to offer only comes after the generic components are firmly in place. However, there are problems with the "information access" model.

First, we run the risk of falling prey to label fetishism, of locking into a favored term without fully apprehending its constraining character: for instance, there are many occasions and contexts when restricted access is not just desirable but essential (e.g. trade secrets, military intelligence, medical files). Second, we may slip into the reification trap, which the "access" model invites—the notion that information exists "out there" and that we connect users with that information using a variety of "*reproduction* and *transmission* technologies" (Lievrouw, 1994, p. 352). Third, "information access" does not adequately comprehend the complexity of issues and perspectives which our field brings (or could potentially bring) to the study of information. There is too little recognition given to scholarly communication (e.g. bibliometrics and citation analysis), information exchange, and informal interaction. Fourth, the importance of designing information systems, services, and products which respond to user/market needs, and satisfy stringent usability criteria, is also missing from the picture. Fifth, important perspectives and functions associated with information management (e.g. strategic systems planning and design; business process re-engineering; intelligence management) are not adequately accounted for by the "information access" model.

CODA

As a field, our primary interest in information is at "the perceptual and conceptual level, in information as it is perceived by the senses, heard, read, seen, keyboarded and spoken" as opposed to "information engineering, defined in terms of the sub-atomic realm of bits, bytes and

code" (Cronin & Davenport, 1991, p. 4). Even taking this difference into account, the "information access" model lacks the requisite variety to reflect the multidimensionality and inter-disciplinarity which the study of information demands at both the perceptual and conceptual levels. What is needed, I believe, is a three-part action agenda: (i) the progressive decoupling of librarianship programs from information science programs leading, eventually, to a two-tier LIS educational system; (ii) support for, and the gradual operationalization of, Wersig's notion of information science as an "inter-concept" via the creation of more inter-disciplinary information science programs, and (iii) aggressive, but selective, faculty recruitment from cognate fields to prevent intellectual atrophy and further inbreeding. Such a strategy should help us determine once and for all whether information science, which, in its broadest sense, "stands for the systematic study of information" (Machlup & Mansfield, 1983, p. 18) truly deserves a place at the high table.

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