

“Crisis as Opportunity: The Shaping of Library and Information  
Science  
Education in the United States”

Joan C. Durrance, Professor  
University of Michigan School of Information

I am honored to be here on occasion of the 50<sup>th</sup> anniversary of the Japan Society of Library and Information Science (JSLIS) and I extend my congratulations and bring greetings from the Association of Library and Information Science Education and the University of Michigan School of Information. I am honored to speak about a topic of vital importance to LIS educators—the shaping of library and information science education in the 21<sup>st</sup> Century. (1)

Today I will discuss change in LIS education in the United States and the trends identified in the recent KALIPER project. KALIPER itself—the Kellogg-ALISE Information Professions and Education Reform project—was funded by a major U.S. philanthropic foundation, the W.K.Kellogg Foundation in response to the fundamental changes that occurred in the larger information world in the past decade or more. KALIPER has received considerable attention and I am pleased to talk about it. I chaired that project’s Blue Ribbon Advisory Committee and others have frequently discussed the relatively positive findings of KALIPER. KALIPER found that LIS programs appear to be changing on a number of fronts—curricula are addressing broad-based information environments and information problems, LIS curricula are incorporating perspectives from other disciplines, they are becoming more user centered, there has been an infusion of information technology, and the structure of the curriculum is changing. Today I plan to discuss these trends and those that have become even more pronounced in the past three years.(2)

For these findings to be understood they must be seen within a larger framework. The one I have chosen is crisis-opportunity. The framework I will use today is aimed to show how the situation today is at once *similar* to LIS education shortly after the turn of the 20<sup>th</sup> Century (facing a major crisis that threatened the institution) and at the same time *fundamentally different* (the crisis affects the an information world that is considerably larger than libraries). Leaders in the early 20<sup>th</sup> Century recognized and responded to that early crisis. The information revolution, on the other hand, has resulted in fundamental changes in the information world that have major implications—and considerable opportunity (or loss)—for LIS education. (3)

#### Origins of Modern LIS Education—A Knowledge and Personnel Crisis

Modern LIS education does not share the long, rich history of libraries, those institutions that for centuries have given order to knowledge. Libraries as organized collections of important and rare materials date back hundreds of years. Japan’s KANAZAWA-BUNKO, for example, dates from 1275. Historically, because books were very costly and were created by hand, libraries were uncommon and were amassed only by rulers and wealthy landowners. These libraries were generally kept by well-read and educated scholars who served as librarians. (4)

The crisis that resulted in the need to create formal programs in library education came with the rapid development of public libraries in the United States during the latter part of the 19<sup>th</sup> Century. At the time that the public library began to take root

the U.S. was a new nation, less than a hundred years old with a large population of immigrants. The first tax supported public library in the world was formed in a small town in the U.S. in the 1830s. By the mid 1870s, there were approximately 300 public libraries in the U.S. Andrew Carnegie, an immigrant himself, coming to the U.S. from Scotland as a lad with a few pennies in his pocket and rising to become one of the richest industrialists in America, used his great wealth to create one of the first major philanthropic organizations—or foundations—in the U.S, the Carnegie Corporation (Foundation). Carnegie's philanthropy provided the impetus and the excitement among city fathers and other wealthy industrialists across America to take the steps necessary to help start tax supported public libraries. By 1900 there were over 1000 public libraries in the United States and just 20 years later that number had doubled to over 2000 libraries! Between 1890 and 1920 the Carnegie Corporation (Foundation) had spent millions of 19<sup>th</sup> Century dollars to pay for public library buildings in hundreds of communities. (5)

But the crisis? This rapid innovation resulted in thousands of libraries, but very few people with the skills needed to run them. This resulted in various efforts to fill the gap. Within the next few years the first cataloging rules had been written, published, and disseminated to a number of libraries where they began to be adopted. Dewey's Decimal Classification System was improved on and an international approach to classifying the world's knowledge, the Universal Decimal System, was developed. By 1915 the first library education association, the Association of American Library Schools, now called the Association for Library and Information Science Education (ALISE) was formed. All the while Carnegie and other philanthropists were prodding local elected officials and political leaders to join with the foundation to build libraries across America, greatly strengthening the cultural centers of many, many communities. (6)

As good stewards of their investment, the Carnegie leadership began to ask about the quality of the librarians who were running these new libraries. The full extent of the crisis was revealed by the first study of library education in 1923. Charles Williamson, funded by Carnegie, found that education for librarianship in those early days after the rapid development of public libraries to be extremely bleak and conducted largely outside of university settings.<sup>1</sup> The report made a group of very ambitious recommendations that ultimately resulted in graduate library education, the creation of standards to assure quality, and faculty who would study the problems of librarianship. (7)

To foster the recommended changes, Carnegie provided financial assistance to a group of fledgling university library science programs. The reforms that resulted from the Williamson Report had the desired effect of raising the level of knowledge of the faculty and the quality of instruction both at individual programs and at a field level. It is important to note that this crisis was library-centered and the opportunity—creating training programs designed to solve the problems associated with the rapid development of a single institution also focused narrowly. Leaders developed educational programs for libraries. This narrow construct, focusing education on a single institution did, indeed, solve the immediate problem, but in the process it contributed to sewing the seeds for later crises in library and information science education. (8)

Leon Carnovsky, a renowned faculty member at the University of Chicago, who spent some time teaching librarianship in post-war Japan, indicated in 1937 that:

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<sup>1</sup> Williamson, Charles Clarence. *Training For Library Service*. New York. 1923

Librarianship as a field of research is still relatively untried discipline. The opportunity for implementing it with significant investigations looms large before those who would be pioneers, provided they are willing to cast off too conventional modes of thought and have the courage to break new ground.<sup>2</sup>(9)

Indeed, knowledge growth in the field was relatively slow at first with the University of Chicago being the only PhD granting institution in the field. By mid-century only approximately 20% of library school faculty had PhDs. Starting in the 1960s the availability of federal government funding for fellowships for doctoral study greatly increased the numbers of PhDs capable of conducting research. By the 1970s 50% of faculty had PhDs and in the 1970s and 1980s the knowledge base of the field grew rapidly with more of a focus on the use of information technologies to store and retrieve information and on ways to increase access to content (knowledge and information). By the 1980s, when 78% of faculty had PhDs, a few researchers began to focus on the process of information seeking and use. As a result, these decades brought research that not only focused on library topics such as the use of library services, library history, online public access, and catalog use, but also more broadly on information storage and retrieval, database development, the value of information, bibliometrics, and on such topics as information needs and seeking. (10)

These decades brought the field research that changed library science into library and information science and sewed the seeds for a paradigm shift in research and thus education. LIS programs began to focus more broadly on information environments and information problems both in faculty research and curriculum development. As faculty broadened their research foci, schools began to see themselves as focusing both on libraries and on information. By the late 1980s a number of schools incorporated information into the names of their schools. Thus over several decades LIS education had shifted from a narrow library focus to a broader information framework. By the 1990s, 90% of LIS faculty had earned the PhD degree. These research faculty continued to broaden the focus of LIS research, resulting in stronger LIS programs. (11)

By the time of the KALIPER study, a small group of influential programs had dropped "Library" from their names. The KALIPER study findings are an indicator that the broadened focus of LIS education over the last decade or so helped to position leading LIS programs for the crisis/opportunity that resulted from the rise of the Internet and the World Wide Web. (12)

### A Crisis in Professional Knowledge At the End of the 20<sup>th</sup> Century— The Information Technology Revolution

The library environment, itself, has changed considerably in the past few decades. Librarians, too, have adopted digital information technologies for their work. Libraries and librarians have always been early adopters of information technologies. For decades librarians have applied computerization to library operations. Standardization and computerization of bibliographic records decades ago made possible automation of library systems, the creation and utilization of giant

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<sup>2</sup> Heim, Kathleen M. "The changing faculty mandate." *Library Trends*. Spring 1986, 581-606; Quote from p. 591.

bibliographic utilities such as OCLC and UTLAS which brought shared cataloging, on-line public access catalogs, bibliographic databases, enhanced interlibrary loan and document delivery, and acquisition of information in digital formats. (13)

Nonetheless the revolution in information technologies in the mid-1990s hit the information profession of librarianship and education for librarianship like an earthquake. The Internet brought radical changes in access to information content and in the abilities of people to communicate and collaborate around knowledge. Computer scientists promised that intelligent agents would provide access to Internet content bypassing intermediaries, including librarians. Some librarians feared that the Internet would make both libraries and librarians superfluous. Some library educators, by the same logic, felt doomed. It is not difficult to see that the Internet and the changing information infrastructure brought at least fear of a crisis by the mid 1990s. So many articles have been written about the influence of the Internet that it seems unnecessary to bring any additional background to this statement. It is sufficient to say that the Internet created a new information landscape—just as an earthquake might. The Internet, built by computer scientists, provided radically new kinds of information flow. (14)

The Internet as a force and a phenomenon could not be ignored in the 1990s and cannot be ignored today. At first the Internet changed the ways that scientists and scholars work. It very quickly changed the way that people think about getting information and influenced the way that commerce is conducted as well as the ways that people communicate with each other. Increasing waves of people became convinced that all the information they needed was readily available on the Internet. However, LIS researchers and librarians recognize that there are a number of misconceptions about the Internet. Christine Borgman of UCLA says.

The claim that the Internet will replace libraries often is based on questionable assumptions. Three common misconceptions are that all useful information exists somewhere on the Internet, that information is available without cost, and that it can be found by anyone willing to spend enough time searching for it.<sup>3</sup>

The Internet provided libraries and LIS education with a major challenge. The broadly framed Internet crisis set the stage for the KALIPER study and report. Like the Carnegie Corporation's activities at the turn of the 20<sup>th</sup> Century, the W. K. Kellogg Foundation provided an opportunity for LIS education to examine itself during this period of radical change. (15)

### KALIPER—Evidence that LIS Programs Can Turn Crisis into Opportunity

Seeing the Internet revolution in its infancy and fearing a crisis in the delivery of information by libraries and in education for librarians that would result in these institutions falling hopelessly behind, the Kellogg Foundation developed a program initiative designed to assure that information professionals would be able increase

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<sup>3</sup> Borgman, Christine. *From Gutenberg to the Global Information Infrastructure: Access to Information in the Networked World* (MIT Press, 2000), p. 194

access to “knowledge and resources” with the aim of improving the “quality of life” for people. The concern at the time was that, without intervention, the Internet revolution might very well render libraries and librarians irrelevant. Kellogg invited several LIS programs to create radical changes in education for information professionals. A proposal by the University of Michigan identified both strengths and weaknesses in the intellectual constructs of such fields as LIS, computer science-engineering, and management information systems.<sup>4</sup> It then proposed a model for information education that would mobilize the strengths of multiple disciplines. (16)

Kellogg generously funded the proposal for the creation of a multi-disciplinary approach to information research and education at Michigan. Kellogg, understanding that LIS programs had been under-funded, provided a major infusion of funds. The grant provided funds for interdisciplinary faculty hiring, the means to develop a major research arm of the School, extensive information infrastructure support for both research and curriculum development, strengthening of mechanisms for enriching student experiences both in the classroom and through practical engagement experiences, and the mechanism for knowledge growth, curriculum development, and testing new models of information delivery. In the process this grant—coupled with a major digital library grant from several federal agencies—transformed Michigan’s School of Information and Library Studies into the School of Information. (17)

There is no question that the major infusion of foundation and federal funds and the growth of knowledge in the field had transformed selected programs. Toward the end of the 1990s the question in the minds of LIS leadership focused on the extent to which other programs had changed. The 1997 conference of the Association for Library and Information Science Education (ALISE), entitled “Reinventing the Information Profession” featured interdisciplinary speakers, highlighted some of the recent changes in LIS education, and challenged participants to think critically about the interdisciplinary nature of education for a changing profession. This conference received funding from the Kellogg Foundation and Kellogg leadership were present.(18)

Following the conference a group of ALISE leaders approached the Kellogg Foundation for additional funds to look broadly at educational changes being made at schools of library and information science and in 1998 research on the KALIPER project began. KALIPER asked: “What evidence/indicators that suggest dynamic curricular changes are occurring in the education for information professionals?” (19)

The KALIPER Report, the most important study of LIS education since the Williamson Report, was issued in 2000. The KALIPER Report Executive Summary<sup>5</sup>, available on the web, has been very well received by library and information science education both in North America and elsewhere. Unlike the Williamson Report which found early library education in disarray, KALIPER found active movements toward change in the education of information professionals for libraries and other information environments. KALIPER reports have been given at major associations and have appeared on the Internet. A number of articles have presented the

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<sup>4</sup> Educating Human Resources for the Information and Library Professions of the 21st Century. A Proposal to the W.K. Kellogg Foundation from the Faculty of The [University of Michigan] School of Information and Library Studies. 1996.  
<http://www.si.umich.edu/cristaled/Kelloggproposal.html>

<sup>5</sup> <http://www.alise.org/publications/kaliper.pdf>

KALIPER findings,<sup>6</sup> In addition, KALIPER has fostered discussions of LIS education in various other countries, including Japan. In the three years since the completion of KALIPER, the trends identified in 2000 have become even more pronounced. I will briefly discuss these trends focusing on recent actions and examples of leadership(20)

## TRENDS IDENTIFIED BY THE KALIPER STUDY

### **TREND #1: In addition to libraries as institutions and library-specific operations, Library and Information Science (LIS) curricula are addressing broad-based information environments and information problems.**

LIS education has changed from a library-focused Ptolemaic model to an information-focused Copernican paradigm. By the time of the Internet “crisis”, LIS programs showed a rapid adoption of an information-focus. KALIPER scholars found that faculty were very much aware that information professionals need to develop a “big picture” view of the information world. Courses were seen as being framed toward broad information environments. They found that schools were marketing both to a diverse student body and a diverse set of employers without, in the process, eliminating libraries as job targets for their graduates. (21)

Based on the KALIPER examination of mission statements, course titles, descriptions and syllabi LIS schools proclaim their domain as covering cognitive and social aspects of how information and information systems are created, organized, managed, priced, disseminated, filtered, routed, retrieved, accessed, used, and evaluated. LIS programs are incorporating approaches to dealing with a variety of new problems into the curriculum including those associated with traditional content with an eye to increasing access to users, including broader information access questions, redefining collections to better incorporate the virtual, implication of digital libraries, and the blurring of institutional boundaries. (22)

A POST-KALIPER LOOK At TREND 1. A Move to Information Programs. The number of LIS programs that have made major changes in their approaches to examining broad-based information problems and information environments and changed their names in the process has increased considerably since the Kellogg Foundation invested in a small group of LIS programs. Just five years ago there were only a handful of such schools. In looking recently at the list of programs accredited by the American Library Association, I found that number to have tripled. There are now fourteen programs that have dropped Library from their names and I expect this number to grow.(23)

The developing critical mass of information schools has enormous potential for actually creating a new information discipline, something I will examine at the end of my remarks. These changes send important messages both to local universities (where computer science programs and business schools have claimed the information domain), and to the library profession which has expressed some

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<sup>6</sup> Durrance, Joan C. and Karen Pettigrew. “KALIPER: A Look at Library and Information Science Education at the Turn of the New Century.” In: *1999 Bowker Annual*. N.Y. R.R. Bowker, 1999. Pp. 266-281. Pettigrew, K. E., & Durrance, J. C. (2001). (Eds). “KALIPER: Introduction and overview of results.” *Journal of Education for Library and Information Science*, 42.1, 170-180. Pettigrew, Karen and Joan C. Durrance. “KALIPER Study Identifies Trends in Library and Information Science Education” In: *2000 Bowker Annual*.

concern that these moves reflect an abandonment of educating librarians as information professionals. (24)

**TREND #2: While LIS curricula incorporate perspectives from other disciplines, a distinct core has taken shape that is predominantly user-centered.**

This trend addresses two important and related areas; it encompasses both increased user-centeredness and increased Interdisciplinarity (often bringing different disciplinary views of the user). How people get and use information has an increasingly prominent role in the curriculum with courses on user-centered design of information retrieval systems, information search strategy, and information-seeking behavior. The missions of most LIS schools as well as the emerging Information Schools are user-centric. The University of Michigan's School of Information's core mission, for example, is based on an integrated approach to the study, design, and management of information systems, in particular *bringing people, information, and technology together in more valuable ways.*(25)

There has been an infusion of multidisciplinary perspectives into LIS curricula results as LIS faculty have broadened their focus beyond libraries, as faculty from multiple disciplines are hired, and as faculty conduct research with other from cognate fields. These perspectives emerge as well when schools offer joint programs/courses or team teach with faculty from other departments. Whether it's due to a shortage of LIS faculty or a perceived need to hire from outside, the faculty at several schools are growing increasingly multidisciplinary with new hires and through additional joint appointments. For example, faculty hired at the University of Michigan since the School became the School of Information include those with degrees in public policy, electrical engineering, computer science, business, linguistics, psychology, and economics. (26)

Information-focused programs focus on individuals, groups or societies. An increasing number of core courses or course elements address information seeking and use. In core revisions, the incorporation of instruction in information seeking was seen in varying degrees of granularity ranging from the cognitive issues of personal information seeking and use to the broad-based role of information in practice and discourse communities. Schools have also increased the numbers of faculty whose interests focus on human-computer interaction which focuses on designing, developing, and evaluating technologies that fit the capabilities of the user.(27)

A POST-KALIPER LOOK AT TRENDS 1&2: Expanded interdisciplinary research that focuses broadly on information problems & environments. KALIPER addressed a variety of curricular and support questions, but did not directly address research in an attempt to maintain a reasonable focus. It is important to note that the move from a library-centered paradigm to an information-centered paradigm and the increased Interdisciplinarity of LIS has resulted in an ability to identify frameworks that more effectively explain the types of research conducted by LIS faculty. The figure, "Broad Groupings of LIS/IS Research at the Beginning of the New Century," that appears in Appendix A was compiled for this presentation and is based on an examination of the LIS research and LIS program websites that feature faculty research. It groups LIS research into five broad categories—information technologies, content, information systems, human information behavior, and the final, cross-cutting categories. It reveals the breadth of contemporary research interests across a wide range of information environments and information problems. It shows that LIS researchers look broadly at problems associated with increasing

access to information so that information can be used more effectively. However, it does not suggest that researchers have abandoned libraries as a topic of research. (28)

TREND #3: LIS schools programs are increasing the investment & infusion of information technology into their curricula.

The increase in investment in information technology infrastructures and the infusion of information technology into the curricula should not be simply dismissed as a sign of the times. Something more meaningful is occurring that's having long-reaching effects. The intense focus on most anything digital is undoubtedly redefining LIS education as we add more core courses and electives to the curriculum, infuse existing courses with digital elements, and seek out more faculty who can teach in these areas. Information technology is attractive, it's fast becoming the glue of our daily existence, and market forces and funders of education and research are willing to support IT development and use. For these same reasons, the parent institutions want programs that lead in teaching and research on the electronic frontier. (29)

A POST-KALIPER LOOK AT TREND 3: Leadership in cyber-infrastructure growth

Information technologies continue to explode requiring LIS programs to continue IT development and to hire faculty capable of incorporating both knowledge and skills into the curriculum. Some schools such as those who participated in the federally funded digital library initiatives are conducting research for cyber-infrastructure development, the comprehensive, advanced infrastructure based on information and communication technology, including the Global Information Infrastructure and preparation for the next generation of information technologies. Faculty in LIS and information schools continue to make strong contributions to the knowledge base in this area.<sup>7</sup> Prof. Dan Atkins at the University of Michigan School of Information recently chaired the National Science Foundation's Blue Ribbon Panel on Cyber Infrastructure that produced a major set of recommendations that are expected to have wide-ranging impact on the cyber-infrastructure of the United States.<sup>8</sup>(30)

TREND #4: LIS schools and programs are experimenting with the structure of specialization within the curriculum.

Schools involved with KALIPER indicated that they were "rethinking specializations" including offering more generic curricula, adding new specializations such as medical informatics, or developing joint degrees with other schools.(31)

At Michigan students may specialize in one of four Master of Science in Information (MSI) areas: library and information services; archives and records management; information economics, management and policy; or human-computer interaction. A "tailored" option allows students to design their own curriculum. It allows students to

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<sup>7</sup> For example Christine Borgman, a faculty member at UCLA, wrote in 2000 an excellent presentation on the emergence of the global information. Christine L. Borgman. *From Gutenberg to the global information infrastructure: Access to information in the networked world*. Cambridge, MA, MIT Press, 2000.

<sup>8</sup> Revolutionizing Science and Engineering through Cyberinfrastructure: A Report from the U.S. National Science Foundation Blue Ribbon Panel on Cyberinfrastructure. Daniel E. Atkins, Chair. January 2003. [http://www.communitytechnology.org/nsf\\_ci\\_report/](http://www.communitytechnology.org/nsf_ci_report/)



combine specializations to suit a particular career interest, or pursue areas which have not yet become formalized specializations, for example information architecture or community information. The option to design an interdisciplinary program appears to be increasingly available to students a various LIS programs.(32)

As part of preparing students for specialization some schools impose program entry and/or exit requirements, such as work experience in industry, or require their students to complete practical engagements or compile graduation portfolios that describe their field experiences during their programs. Other exit requirements include successfully completing internships or other practical engagement activities. (33)

TREND #5: LIS schools and programs are offering instruction in different formats to provide students with more flexibility.

Flexibility in the curricula is perhaps nowhere as evident as in instructional formats. Today's students have more choice than ever regarding course length, day and time of course offering, and on or off campus meetings. Traditionally, distance education courses were offered in a different physical location; within the past few years there are an increasing number of off-campus courses offered via some form of telecommunication and/or via the Internet. (34)

#### A POST-KALIPER LOOK AT Trend 5: Distance Education

Ten years ago only 10 North American schools offered courses using this new option. Now 36 programs provide technology assisted distance-education degrees.<sup>9</sup> For example, the University of Illinois's Graduate School of Library and Information Science Education's distance education programs have served as excellent alternative delivery models for several years. Illinois' nationally recognized faculty combine brief periods of on-campus instruction with Internet instruction and independent learning. Students complete most of their course work at the site they choose--usually their home or office using advanced technologies that provide live, Web-based instruction. (35)

TREND #6: LIS schools and programs are expanding their curricula by offering related degrees at the undergraduate, master's, and doctoral levels.

#### A Post KALIPER Look At Trend 6: New degrees

This is an area of continued growth in the three years since the KALIPER report was issued. Some LIS or Information School programs have several different master's degrees. The area of most growth has been the addition of undergraduate programs. A number of schools have developed or are developing innovative undergraduate programs (majors and/or minors). Undergraduate degrees are offered in such areas as: Information Technology; Information Science; Information Systems; or Information Technology and Informatics. In several schools those seeking undergraduate degrees comprise more than a third of the student body. (36)

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<sup>9</sup> Daniel, Evelyn and Jerry D. Saye. "Highlights of the 2001 ALISE Statistical Report with a five and ten year comparison of key data elements."  
<http://www.ils.unc.edu/ALISE/2001/Highlights.htm>

In sum, the changes identified in North American LIS programs by KALIPER scholars have continued and accelerated, thus shaping LIS education for the new digital era. The most noticeable changes have been in increased Interdisciplinarity, the move toward curricular developments and research that focus broadly on information problems and environments, and the move toward the development of information schools. LIS programs are stronger than ever. Students better understand the needs that people have for information and how to more effectively assist them in getting the information they need, they gain skills in using information technologies, they have a broader understanding of information systems. These changes have not only prepared LIS education for the digital age, they have also moved LIS education toward a new potential crisis born of the Internet, the convergence of various disciplines, each making some claim on control of the Internet.(37)

### The Rise of Rivals for Information Education OR Convergence Toward Creating and Defining a New Discipline?

Conditions are ripe either for the field's most serious crisis or for an unparalleled opportunity. The digital earthquake changed the information landscape. The Internet has created an uneasy playground for a disparate group of professionals and researchers providing both threat and promise. Various competing players each breaking out of formerly narrow constructs have claimed primacy on the Internet. The Internet crisis has resulted in a new set of problems that need to be solved and competing interests with different solutions.(38)

Eight years ago, light years in the rapidly changing cyber world, two LIS researchers, using an ecological metaphor compared library science education to the Panda Syndrome. Referring to the panda's preference for a single plant, they noted that the cute, well-loved, animal is nearing extinction because of its limited ecological niche. They argued that traditional LIS education programs were doomed to extinction. They warned that

LIS education is operating in an extremely dynamic and highly competitive environment. The growing importance of information, developments in information technology and the information environment, and LIS' own efforts at adaptive radiation have created an ecological convergence between LIS and other professions and professional education programs both in LIS' traditional niche (e.g., "digital libraries") and new niches (e.g., information management). The information field is undergoing radical change, and LIS is not the only profession seeking to claim jurisdiction.<sup>10</sup> (39)

Examples of converging and competing interests include: the development of various informatics programs, most commonly medical informatics in Medical Schools and information management programs in Business Schools. (40)

With the rapid rise of the personal computers in the 1980s and the urgent need to improve computer interfaces for non-computer scientists, the sub-field of computer science now known as human-computer interaction (HCI) emerged. Its primary professional organization, the Computer-Human Interaction (CHI) developed in the early 1980s as a Special Interest Group of the Association for Computing Machinery (ACM). HCI programs exist in a number of universities. Scores of programs are

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<sup>10</sup> Van House, Nancy and Stuart A. Sutton. "The Panda Syndrome: An ecology of LIS education," *Journal of Education for Library and Information Science* 37 (2), 1996:131-47.

emerging from computer science that focus broadly in preparing students broadly for careers in information technology. These programs are becoming increasingly interdisciplinary with the realization that the knowledge from a single discipline is inadequate either to conduct research or to develop relevant curricula. (41)

The differences across disciplines pose difficult hurdles for those who seek to surmount them. They also offer incredible opportunities. Some intellectual leaders have begun the task. Major digital library initiatives funded by the U.S. government brought together researchers from different disciplines and fostered interactions between computer scientists, LIS researchers, economists, and others. These interactions have provided a vehicle for examining disciplinary differences and, as a result, researchers across several fields have come to a better understanding of their differences and have begun to develop “a view [of digital libraries] that encompasses the social, behavioral, and economic contexts in which digital libraries are used.”<sup>11</sup> Rival claims of jurisdiction over the domain associated with the new information world could nudge LIS education into its former narrow library focus or computer science, for example, into its narrow information technology focus. However, convergences, such as those that resulted from the digital library initiatives, can be seen among a diverse group of researchers interested in the emerging information domain and in many newly formed interdisciplinary “Information” programs. (42)

The most recent opportunities to have emerged from the new information landscape are cross-disciplinary experiments. One example is seen in the increased interdisciplinarity of faculty hiring. New Information schools that have evolved from LIS programs have hired PhDs from LIS, HCI, information economics, and other and other fields. UC Irvine, a school that had its roots in computer science has sent PhDs to several of the new information school programs and a dean to the University of Michigan. Penn State, a newly formed Information school with no history of LIS, has hired faculty with LIS degrees. These new Information Schools have begun to graduate PhDs who have learned from interdisciplinary faculty and are going on to take positions in changing LIS or computer science programs. (43)

Information schools with faculty who have exceedingly different intellectual foci and disparate cultures, values, methods, traditions, and approaches to knowledge development into a single faculty are often faced with culture-shock. Newly interdisciplinary programs need to take steps to overcome differences and build on the strengths of the various disciplines represented by their faculty. Academic integration at the program level is crucial at this stage of development. (44)

At a field level two very important convergence activities are underway. If successful they will help create the new discipline of information. The first brings together the new information schools emerging from LIS with the aim of creating support systems that will make it easy for these new information-focused programs to discuss their changing missions and problems associated with these changes. Meetings have been held at the American Society for Information Science and Technology (ASIST) and at the Association of Library and Information Science Education (ALISE) to hold discussions about broad issues associated with the question of convergence made possible by the common interests of many computer science, engineering, library and information science and management information systems programs. (45)

Another initiative is focused on bringing together a community of deans of information schools that initially consisted of information-focused programs from computer science. This group has been meeting under the auspices of the major US

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<sup>11</sup> Borgman, pp. 33-52.

association focused on research in information and computing, the Computing Research Association (CRA) ([www.cra.org](http://www.cra.org)). CRA started originally as a membership association of computer science departments, but has expanded to include the other kinds of programs. These two notable initiatives are beginning to converge with former LIS programs becoming active in the CRA discussions. At present about fifty programs, including a group of leading LIS/IS schools, are participating in the CRA initiative. These meetings focus on examining the implications of the convergence of various disciplines into a common domain and building a conceptual picture of the intellectual territory covered by all the research and instruction programs. A major conference to examine the intersection of interests represented by a variety of academic programs is planned for summer 2004. (46)

While it is still possible that the Internet revolution will swamp LIS/IS education, it appears to me that recent efforts by thought leaders from a variety of disciplines, including LIS, are likely to succeed in bringing an interdisciplinary convergence that will result in forging a new discipline that will more effectively develop and harness technologies, systems and practices with the aim of bringing the benefits of convergence to society. These efforts are based on the assumption that achieving these benefits will require the intellectual power and energies for multiple disciplines. I leave you with a quote from Christine Borgman who speaks for many LIS educators.

Access to information is too important a problem to leave entirely to government officials, corporate policy makers, librarians, archivists, computer scientists, or lawyers. Rather it is a problem faced by people in all walks of life, at most stages of life, in all parts of the world.<sup>12</sup> (47)

Thank you very much for inviting me to share with you the 50<sup>th</sup> Anniversary of the Japan Society of Library and Information Science. It is a great honor to share this anniversary with you. (48)

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<sup>12</sup> Borgman, p. 269..

## Resources

American Library Association. Congress on Professional Education. 1st Congress on Professional Education: Focus on Education for the First Professional Degree (June, 1999); 2nd Congress on Professional Education (November 2000)

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Appendix A. Broad Groupings of LIS/IS Research at the  
Beginning of the New Century<sup>13</sup>

Information Technologies	Information/ Knowledge (Content)	Information Systems	Human Information Behavior	Cross-Cutting Areas
technology capabilities and limitations	defining the nature of information and its value	information storage and retrieval	information needs	Historical aspects
historical aspects (including various information technology innovations)	life-cycle of information	computerized information systems	information seeking and search processes	Management approaches and concerns
issues; legal questions	publishing (including electronic)	user-centered design of information systems	characteristics of information users	Evaluation approaches and issues
impacts of IT	physical and virtual collections	approaches to organization of knowledge/information	information use and uses	Information policy
identifying and selecting information technologies	economics of information	increasing system capabilities	human information interaction	Methods
human factors in technology	costing and pricing of information and information services	search retrieval models	information literacy	
specific information technologies such as the internet and web technologies	value-added functions	database and file structure	impacts (outcomes) of information use	
cyber-infrastructure	bibliometrics; webmetrics	computer-human interfaces	effects of information on decision-making	
		expert systems & intelligent agents	communication and professional practice designed to increase access to information (including service development)	
		studies of use of the system or information resources		

<sup>13</sup> This table is influenced both by examination of individual research profiles of LIS faculty on School websites and Ch. 2 of Richard Rubin. *Foundations of Library and Information Science*, N.Y.: Neal-Schuman, 2000. (especially pp. 23-53).