New models for information education: Contrasts in curriculum, collegial relationships, and administration

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Education for the information profession is in a state of radical change and re-design. Academic units are being reorganized around new interdisciplinary paradigms, while new curriculums are being developed to address the needs of a growing and diverse information profession. Existing schools which offer multiple information degrees and are based upon interdisciplinary models, such as Syracuse, Pittsburgh, Drexel and Rutgers Universities have been or are being joined by others such as the University of North Texas, the University of Michigan, and the University of California at Berkeley. This paper surveys the changes taking place in these schools in the areas of curriculum, interdisciplinary organization, and management. The author's experience as Dean of two of these institutions are highlighted to examine alternative models: those at Syracuse University's School of Information Studies and those of the School of Library and Information Sciences at the University of North Texas. The significant differences for comparison are those associated with different information degrees having a common core of courses, as opposed to degree programs with separate core requirements but with shared electives. In terms of interdisciplinary organization, one institution achieved interdisciplinarity through leveraging university resources by having faculty participants in its degree programs from five different academic units. At the other institution, the interdisciplinary faculty is found within a single academic unit. The author describes organizational and curriculum differences and circumstances with these and other programs, and provides findings which may be helpful to the development of new information programs.

Development of degree programs

Syracuse University's School of Information Studies and the University of North Texas' School of Library and Information Sciences provides contrasting cases for examining difference in for both curriculum development, collegial relations and administrative organization.[1] Both programs share their origin in the education for

professional practice of library service. Each school began by addressing the needs of professionals who were people oriented, service oriented, and valued the preservation of the knowledge of the past and the free access to knowledge by a broad population of citizens. Each school had one or more programs accredited by the American Library Association, yet each sought, at one point in its history, to address a broader constituency. Each school moved toward offering a variety of degree programs to address multiple constituencies, and each recognized that interdisciplinarity was at the heart of both research and education in an emerging new information field. With these elements in common, each school took a different approach to both curriculum design and organizational structure.

Syracuse University's School of Information Studies offers five distinct academic degrees: Information Management and Technology (IMT); Library Science (LS); Information Resources Management (IRM); Telecommunication and Network Management (TNM); and Information Transfer (IT) (see Figure 1). Although the school is 101 years old in 1997, it remained library-focused until 1974 when it began to embrace a broader constituency by changing its name to Information Studies. The PhD program which had been founded in 1968 took on a broader focus than libraries and was given the degree name "Information Transfer." In 1980 SU was the first in the nation to offer a Master's degree in Information Resources Management, with the School's third Master's degree in Telecommunications and Network Management established in 1993. The School's Bachelor's degree program in Information Management and Technology had already been established in 1987. With the exception of the PhD, which is a broad-based research degree, SU's degree programs focus on information systems and services which are informed by both management and technology. Each program, however, varies in its emphasis in each of these areas (telecommunication has greater technology content; library science has more managerial content), has an independent knowledge domain, and a professional expression (see Figure 2).

The University of North Texas offers degrees in both Library Science (LS) and Information Science (IS) under four distinct degree programs. The School, which celebrated its fifty-eighth year in 1997, established the Bachelor's degree in Library Science at its inception. A Master's degree, again in Library Science, was added in 1963. A doctoral degree was added in 1969. After 1977, new degree programs were begun in Information Science to parallel those in library science. By 1990 a process of streamlining and consolidating degree programs was begun, with the elimination of the PhD in library science in favour of a newly reorganized doctorate in information science which was both intellectually and administrative interdisciplinary. The Bachelor's in Library Science curtailed new admissions in

favour of the existing bachelor's in Information Science, and the School's two Master's degrees in Library Science and Information Science were reorganized.

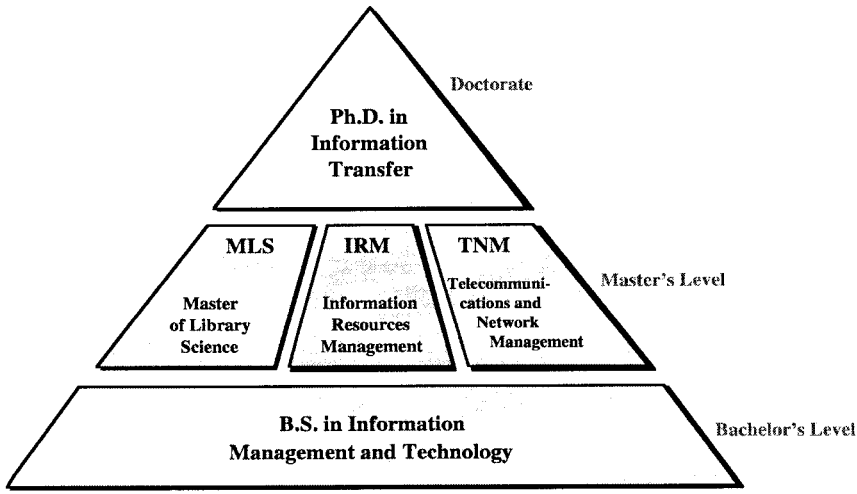

Figure 1. Syracuse University School of Information Studies: Degree Programs

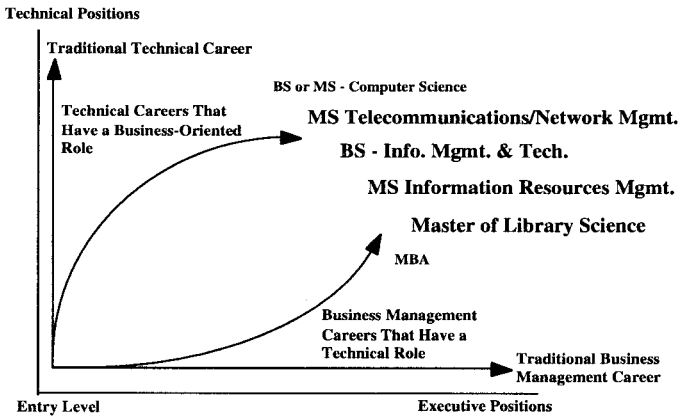

Figure 2. Syracuse University School of Information Studies: Academic Focus of Degree Programs

The Bachelor's Programs

While the bachelor's programs at both Syracuse University and the University of North Texas may be of interest to describe individually, they are difficult to contrast. At the time of this writing, the program at North Texas is in many ways tied to the School's master's in Information Science, and because of its intentionally limited enrollment, has undergraduates generally attending sessions in existing master's courses. The Bachelor of Science in Information Management and Technology at Syracuse University is an established degree program with nearly five hundred majors with its own unique courses, program director, and support staff including an advisor, career planning professional, and marketing specialist. One-third of the curriculum is in required courses including an Introduction to Information Management and Technology, courses in Information Technology, Information-Based Organizations, and a Pre-Professional Seminar on Information Issues "capstone" seminar. The remaining electives in the major require students to chose courses in three distinct areas. The program rests heavily on the liberal arts and sciences, with 70% of the program taken outside the school.

Students take minors in a number of different areas, the most popular of which is Management. Dual majors are available to qualified students.

Undergraduates in SU's bachelor's program must take courses in the areas of Management Approaches and Strategies, Information Systems and Telecommunications, and Users and Information Services. Courses in each of these areas provide students with an exposure to the knowledge and skill sets which enable them to practice in diverse functional and organizational settings. Management Approaches and Strategies include courses in analysing organizations' information needs, financing and acquiring information technology, and managing information resources. These provide base skills for information resources managers, consultants, systems analysts, and information policy analysts. Information Systems and Technology includes studies in building, implementing and evaluating computer systems and networks, including voice, data, and wireless communication technologies. Courses in this area provide entry level skills for automation designers and consultants, telecommunications analysts, and telecommunication managers. The Users and Information Services area provides course work in understanding users' information needs, mediation between users and complex information systems, and conducting professional research. Studies in this area provide students with knowledge to serve as data clearinghouse researchers, information policy researchers, and information brokers.

The placement record for SU's undergraduates has been gratifying, and employer demand continues to rise. Nearly all graduates from the BS program can expect full professional employment or admission to graduate study within the first six months after graduation. A survey taken in 1996 showed IMT graduates received the highest starting salaries of any major in the university, including engineering and business. Recent positions have included Business Analyst, LAN Administrator, Program Analyst, Business Process Consultant, Network Information Specialist, and Database Specialist, to name a few. Students have found their career paths in Arthur Anderson Consulting, Digital Equipment, IBM, Intel, JP Morgan, Martin Marietta, and other national and regional corporations both large and small. High demand is evident and increasing from small businesses in non-traditional areas including interactive multimedia, learning technologies, and applications for electronic commerce and Web site development.

Curriculum contrasts at the graduate level

The most interesting curriculum contrasts appear at the graduate levels. Differentiations are driven partly by history, partly by philosophy, and partly by administrative organization. While differences between the North Texas and the Syracuse master's degree programs lie in the kind of degree structure, the

differences at the doctoral level reside in the amount of degree structure. At the master's level, the degrees at both institutions reside in their own academic units and are integrated internally. By contrast, the doctoral program at Syracuse is internally based in the school and draws on its interdisciplinary faculty from within the school, while the North Texas doctoral program requires a structure which integrates external units toward a common degree program.

Master's degrees: Syracuse University

While Syracuse University has three distinct master's degree programs with three separate audiences, functional objectives, and applications arenas, all degree programs are linked together by a common set of curricular foci (Settel and Marchand, 1988). These include information resources, which examines information and knowledge creation, communication, identification, acquisition, organization, representation, storage and retrieval. This is considered an area central to the information field and the programs of the school. Information Users is a co-equal focus, and differentiates the information field from those with more managerial or technical emphasis. The philosophy underlying this approach is that systems must be developed with the user as measure of utility, and design must be based upon user behaviour and needs, rather than behaviour adapted to system needs. User group range from types of individuals working alone to work groups, organizations, and entire industries. Information Services, which have their roots in the library field, are emphasized in all degree programs as a reflection of our movement to a global service economy. Information Systems are essential to each program, not only because of the important role technology plays in the provision of information, but also as a discipline and methodology for analysis. Information Management is a common element of the curriculum ranging from strategic management of information resources in organizations to library and media centre administration. Information Policy has played an important historical role in the school with special emphasis on national and international policy formulation and implementation. Policy formulation and implementation are now part of all organizations which are dependent on shared information resources and technologies. Information Research is central to the curriculum at every level and in every program, not only because of its central role in the information field, but also by virtue of Syracuse University being a national research university and SU having the declared vision of being a "Student Centred Research University".

While it is important for any faculty to articulate common values as they apply to curricula, it is essential at Syracuse where a common "information culture" has been nurtured by more than a generation of scholars (Katzer, 1990), and were the various master's degrees do not share common core courses. Each of the three

master's degree programs stands alone on a separate core, yet each graduate student can take any relevant elective or specialty course for which he or she is qualified after completing their degree's core. This requires School-wide faculty dialogue in curriculum design at the intermediate and advanced levels, and an organized system of advisement. The master's degree program and their individual cores include:

•Master's of Library Science (LS)
- Introduction to the Library and Information Professions
- Information Services and Resources
- Policy, Social and Economic Issues of Libraries and Information Centres
- Management of Libraries and Information Centres
- Information Systems: Theory and Design

•Master's of Science in Information Resources Management (IRM)
- Research Techniques for Information Management
- Introduction to Information Resources Management
- Strategic Management of Information Resources

•Master's of Science in Telecommunication and Network Management (TNM)
- Introduction to Telecommunications and Network Management
- Telecommunication for Information Managers
- Telecommunication and Network Technology
- Telecommunication Policy and Regulation
- Research Techniques for Information Managers (common with IRM)
- Strategic Management of Information Resources (common with IRM)

The flow of courses from separate cores to individual degrees is illustrated in Figure 3.

While each of the degree programs have secondary 'tracks' which provide recommended electives for each degree area, all relevant courses in the school are open to qualified graduate students with the permission of their advisor. The Telecommunications and Network Management master's has Management, Policy, and Technology tracks; the Information Resources Management master's has Management and Strategy, Information Needs, and Technology Infrastructure tracks; and the Library Science master's has track ranging from Academic Libraries through Organization of Information. Yet students from all three programs may find themselves in courses such as Behaviour of Information Users, U.S. Federal Information Policy, Information Networking, or Database Administration Concepts and Database Management.

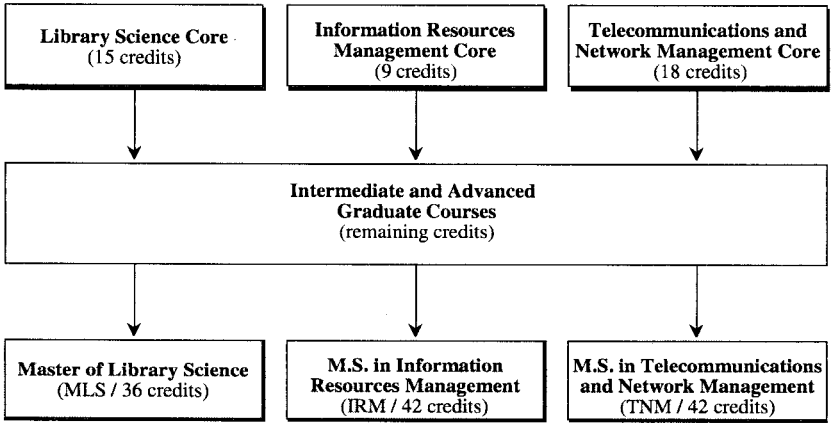

Figure 3. Syracuse University School of Information Studies: Masters Degrees

Master's degrees: University of North Texas

The philosophy informing the degree programs at The University of North Texas is that there is a common information profession with professionals practising in a number of functional contexts and environments, and that the information professional should have a common foundation of knowledge as expressed in a common core. Half of the curriculum is devoted to this common core, which addresses a wide variety of functions and environments. The common master's core consists of:

- Foundations of Library and Information Science
- Research Methods and Analysis
- Fundamentals of Information Organization
- Management of Information Agencies
- Information Resources Development
- Information and Access Services

The flow of courses from a common core to individual degree programs is illustrated in Figure 4.

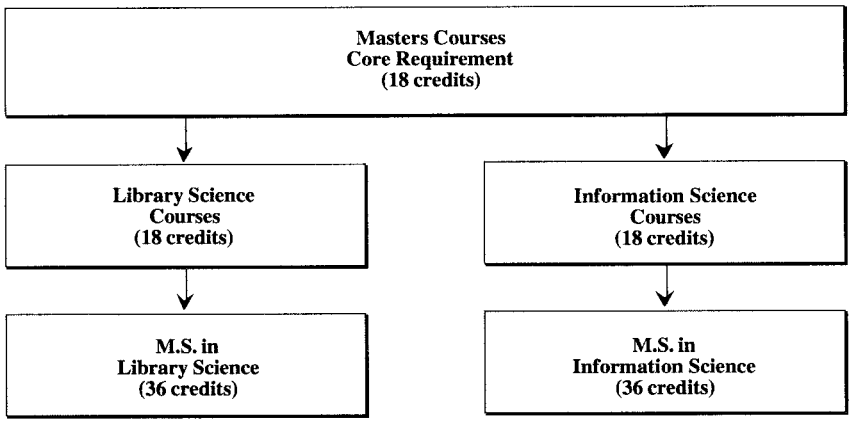

Figure 4. University of North Texas: Masters Degrees

The source of faculty concern and frequent point for faculty debate is how large to make the core, and what content is common to the entire information profession. Proponents of a small core hope to provide students in their area with a greater degree of specialization and as a consequence, would create a greater differentiation between the degree programs. Proponents of a larger core believe that there is a large body of essential skills, knowledge's, and values that needed to be shared by all information professionals, and that these can be applied in a multitude of environments. Additional issues arise concerning which intermediate and advanced courses are appropriate to the library science degree or the information science degree.

PhD degree: University of North Texas

The PhD program at the University of North Texas was developed in 1989 with the assistance and review of leading academics in the field who were committed to interdisciplinary education and research. The design of the program was framed by Tefko Saracevic, Professor at Rutgers University School of Communication, Information and Library Studies. The program organization was also reviewed and restructured by Christine Borgman, Associate Professor of the then Graduate

School of Library and Information Science at UCLA. Other reviewers included Donald Kraft, Professor and Chair, Department of Computer Science at Louisiana State University, and Claude Walstrum, then Dean of the School of Library and Information Science at the University of Maryland. The single objective was to bring together a large interdisciplinary faculty focused on information, within the resource constraints of a state university that had existing programs treating various facets of the information field.

The program developed around selected existing faculty in five different academic units in four separate colleges in the university. The participants included a total of twenty-five faculty from the Department of Business Computer Information Systems in the College of Business Administration, the Department of Communication Studies and the Department of Computer Science in the College of Arts and Sciences, the Department of Technology and Cognition in The College of Education, and the information science faculty in the School of Library and Information Science. The degree program is administered under the Graduate School, but the direction of the program is given to the Dean of the School of Library and Information Sciences which has a central role in the programs (see Figure 5).

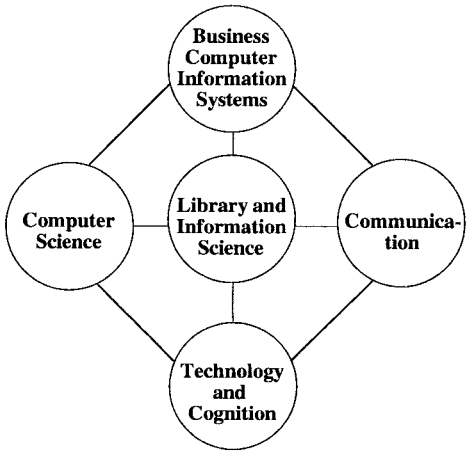

Figure 5. University of North Texas: Interdisciplinary Ph.D. Program in Information Science

While new courses were developed for the program, these were primarily courses developed as core doctoral courses by the School of Library and Information Sciences. Most other courses in the program were existing courses already being offered in the other schools or colleges for other degree programs. Concerns about course duplication were addressed. Moreover, the structure of the program prevented students from focusing on any one participating disciplinary area (the Departments of Computer Science and Business Computer Information Systems departments had their own PhD degrees), but focused study on three broad information areas which drew from a number of departmental specialties. The degree focused on three areas of excellence:

- Accessibility, communication, management and use of information resources;
- Human communication and information behaviour and the systems and technologies that enhance communication and learning;
- Information and communication processes in managerial, organizational, social and technical environments, and the accompanying analysis, design and evaluation of information systems.

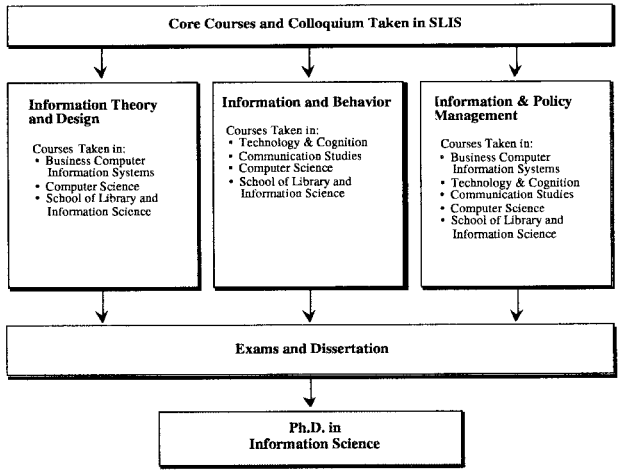

Figure 6. University of North Texas: Interdisciplinary Ph.D. Program in Information Science

Three areas of concentration are available to students: Information Theory and Design, Information and Behaviour, and Information Policy and Management. Students are required to take courses in two of the three areas, with a limitation in the number of courses that can be taken in any one academic unit with the exception of the School of Library and Information Sciences. The School of Library and Information Sciences is also the only unit to have courses in each of the three areas. All students were required to take a continuing Interdisciplinary Colloquium and nine hours of core courses, all of which were in the School of Library and Information Sciences. The degree structure is illustrated in Figure 6.

PhD program: Syracuse University

The program at Syracuse University is based upon an interdisciplinary model within a single academic unit: The School of Information Studies. With a full-time faculty of twenty five, and nearly fifty faculty associates, the faculty combines expertise in information science, telecommunications, public administration, management, management information systems, linguistics, computer science, instructional design and development, communications research, and library science. Faculty colleagues from the S.I. Newhouse School of Public Communication, the Maxwell School of Citizenship and Public Affairs, the L.C. Smith College of Engineering, and the School of Management participate in collaborative doctoral work.

The School of Information Studies is located in the Centre for Science and Technology where faculty and students are active participants in two centres: The Centre for Advanced Technology in Computer Applications and Software Engineering (CASE) and the Northeast Parallel Architectures Centre (NPAC). Major funded research opportunities in the School include the Educational Research Information Clearinghouse (ERIC) and associated projects in the School's "Information Institute" which includes a variety of federally sponsored programs and projects sponsored as part of AT&T's Learning Network. The TextWise Project is an R&D centre for advanced natural language processing systems with a staff of nearly thirty, many of whom are PhD students. The PhD program focuses on the following areas:

- impact of information technology;
- analysis of non-numeric text;
- information policy;
- economics of information;
- electronic commerce;
- human-computer interaction;
- information retrieval;

- information needs and uses;
- design of information systems.

Students engage in research every semester under the direction of different faculty in the school. There is only one required course in the program: a research methods seminar. All course work is taken in consultation with a faculty mentor, and each doctoral student has an annual individual evaluation with members of the faculty to identify significant gains in the past year and to suggest courses and activities for the following year.

Discussion

At the master's level, each of the two Schools discussed have programs within their own academic unit. Differentiation in degree programs at Syracuse University is achieved by the creation of separate core requirements. Each degree program provides a clear set of learning objectives and career path. There is a minimum of uncertainty among applicants about which degree is appropriate, although some students, after a period of professional practice, will take a second graduate degree. At the University of North Texas, students have more uncertainty about which degree to follow, although a degree of comfort for some information students is that both degrees are accredited by the American Library Association. Among the faculty, there is less consensus about the nature and extent of the common core because it has to accommodate both degree programs. Syracuse University's mature "interdisciplinary culture" and broad information focus readily accommodates separate required core courses with integration and sharing at the intermediate level.

In the PhD programs, the University of North Texas' model is based upon a matrix management concept which shares both the strengths and weaknesses of that type of organization (Barber, 1983). It is responsive to change, leverages scarce resources, and provides an arena for synergy. On the other hand, it poses distinct leadership problems and management issues, and lends itself to (constructive) management conflict. Because the lines of control are ambiguous from the Dean (director) of the doctoral program to the Department Chairs to the faculty, controls are introduced at the degree requirement level to prevent overlapping, duplication, goal displacement, and to assure quality control. No such program controls are necessary in the Syracuse example (only one course requirement) because the administrative lines (and allocation of resources) are clear, and the program is mature, has high stature, and has demonstrated success. Both organizations share characteristics of current management practice reducing traditional control and hierarchy through matrix management (North Texas) or by creating a relatively flat organizational structure where a large faculty, an extensive research organization,

and five degree programs are accommodated with no departments or department chairs (Syracuse).

Education for the information professions is in a state of radical change and re-design. Academic units are being reorganized around new interdisciplinary paradigms. In 1995 the University of California-Berkeley's School of Library and Information Science was given a new mission and was reorganized as an interdisciplinary School of Information Management and Systems Larson, 1997). In November 1995 the author spoke at the "Conference on Information and Communication Sciences" held at the University of Arizona to address concerns for a common vision for the computer, communication, and the information sciences. Under the leadership of the Commission, established by the Provost under the direction of Jay F. Nunamaker, industry and academic experts .were brought together to explore new models for academic organization and curriculum structure. The University of Arizona is now in the proposal stage of creating a College of Communication and Information Sciences (Nunamaker, 1997). The University of Indiana admitted its first class of students to the Master's of Information Science degree program for the Fall 1996 semester. The new program shares a common core of courses with the Library Science program, similar to the University of North Texas described above (Cronin, Kling, and Rosenbaum, 1997). In March, 1996 the Board of Regents of the University of Michigan unanimously approved the formation of the School of Information from its foundation in the School of Information and Library Studies, and reaffirmed their endorsement of the school's five-year plan to redefine its curriculum under the CRISTAL-ED vision supported by the W.K. Kellogg Foundation. New models for faculty organization and curriculum development are already taking place. Finally, in June 1996 the University of Pittsburgh's School of Library and Information Science was renamed the School of Information Sciences as a sign of the convergence of disciplines in the information field.

Each of the above changes represents a fundamental re-evaluation and redirection of information education to meet twenty-first century needs. The analysis of administrative and curriculum organizations at the University of North Texas and Syracuse University should provide valuable insights into the direction these changes may take. Taken as a whole, each organization has adapted to its local environment, its resources and its history. Each has responded by creating an organization, curriculum, and structure providing multiple degree programs within an interdisciplinary framework. The schools which are now adapting and developing to meet the needs of the expanding information profession may yet find new approaches to achieve these ends.

Note

1. The author is Dean of the School of Information Studies, Syracuse University. He was previously Dean of the School of Library and Information Sciences, The University of North Texas. See also von Dran, Raymond F. "Organization for Information Education: Contrasts in Curriculum Structure and Administrative Locus of Control," *Proceedings of the Thirtieth Hawaii International Conference on System Sciences*, vol. II, 1997, pp. 23-28.

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