Librarians as Members of Integrated Institutional Information Programs: Management and Organizational Issues[1]

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ABSTRACT
THIS ARTICLE DESCRIBES some of the roles and relationships developing in IAIMS (Integrated Academic Information Management System) environments, primarily, but not exclusively, in academic health sciences settings, which have been funded by the National Library of Medicine program. It discusses several organizational and management issues and related implications which are emerging as librarians become integral parts of faculty teaching and research efforts and as the library assumes broader administrative responsibilities.

INTRODUCTION

For many years, academic librarians have joined faculty in academic activities that range from team teaching to developing and teaching stand-alone courses in a variety of disciplines (Hall & Byrd, 1990; Mellon, 1987; Thomas, 1988). In the health care environment, clinical librarians have participated as members of the patient care team to identify questions raised in the course of medical rounds and then search the literature for appropriate articles and provide them to the physicians and other health professionals on the team (Cimpl, 1985). In the research arena, librarians have been funded with grants to organize and manage the literature of specialized subject domains. Library administrators have been called upon to manage departments and programs outside the library, including computer

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centers, media production services, microcomputer laboratories, and classroom support services.

Although librarians have been working alongside faculty, researchers, and administrators in these and related areas, few articles can be found in the literature which deal directly with the impact of these roles and responsibilities on the management of librarians who become integral parts of faculty teaching and research efforts or, indeed, who lead a program team which includes faculty, researchers, and administrators from other disciplines.

One can speculate that the literature may be scant because, until recently, these occurrences have been relatively isolated, and, in any single library, only one or two librarians might be performing in these nontraditional roles. IAIMS (Integrated Academic Information Management System) development has changed that. In IAIMS institutions, the reverse is more likely to be true—i.e., there are relatively few librarians who are *not* participating integrally in research, administration, or teaching in the broader institutional context and working alongside colleagues who are as likely to be faculty and researchers from other disciplines as they are to be librarians. In some health sciences centers, librarians are actually leading the institution-wide information systems planning and development efforts, thus challenging Veaner's (1990) assertion that librarianship is "naturally derivative, following rather than leading institutional development" (pp. 2-3).

What is IAIMS? While the term has a variety of connotations in different contexts, it is foremost a National Library of Medicine initiative that provides funding for planning and developing health sciences centers' systems which integrate management of, and access to, a wide array of information resources including clinical, research, library, and administrative. This program was a direct response to recommendations in a report of the Association of American Medical Colleges, commonly referred to as the Matheson Report (Matheson & Cooper, 1982). IAIMS has begun to change not only the information architecture of academic health sciences centers but their libraries as well.[2] While networks, computers, databases, and information systems are fundamental to the IAIMS process, the most challenging areas are those entailing changes in the organizational "culture." IAIMS is not just the wires, machines, software, or automation, it is, rather, a process that involves looking at the very fabric of the institution, the relationships among departments, schools, hospitals, and, above all, the relationships among people, for the purpose of taking a rational planned approach to the building of information

systems which will serve the needs of all while minimizing redundancy and maximizing the benefits from investments in resources (Anderson, 1990).

By its inherent nature, planning and implementing an IAIMS program leads to strong collaborative peer relationships among librarians and other faculty and administrators. Such relationships can certainly flourish without an IAIMS program. An IAIMS program, however, cannot succeed in their absence. The basic premise underlying these relationships is that the institutional role of librarians transcends the traditional one of organizing, preserving, and servicing the institution's collections of the published literature and of caretaking the facilities that house them. IAIMS thus demands the participation of librarians in areas outside their traditional purview in order to support the institution's general educational and administrative goals. One outcome is that the skills of librarians in the area of information organization and management are now being recognized as valuable commodities in the information rich and organization poor environment of the health sciences.

Librarians' roles in an IAIMS environment are many and varied. They range from facilitating and brokering to leading and catalyzing cooperative relationships among nonlibrary groups and individuals (clinicians, faculty, administrators, librarians, hospital staff) who have not previously had reason to work together. Such collaborative relationships lead to substantive work by staff librarians as partners, not as servants, with outside units and individuals whose domains abut and increasingly overlap those of the library.

Issues consequent to IAIMS development arise from two major perspectives: that of managing staff librarians who are integral members of teams outside the library's direct purview as well as those which occur when nonlibrarian professionals work within what has been the traditional library arena. While we draw heavily on our own experiences and on those of colleagues in other health sciences institutions that are actively engaged in developing IAIMS programs, the issues noted here are broadly applicable in other settings, particularly in research libraries.

ROLES AND RELATIONSHIPS

Librarians are working as researchers and research collaborators under various administrative arrangements. Some are staff librarians—i.e., are salaried staff members in the institution's library. Among the variety of arrangements are:

- Staff librarians who are also grant-funded members of research teams in a school or department. They write proposals as well as gather and synthesize information.

- Staff librarians pursuing their own research interests, some to fulfill mandatory tenure requirements.
- Staff librarians who are collaborators on informatics research projects—e.g., UCLA Biomedical Library, Columbia Health Sciences Library, University of Washington Health Sciences Library and Information Center (HSLIC).
- Librarians working in a research laboratory which is a distinct program within the library—e.g., the Knowledge Management Laboratory at Johns Hopkins Medical Library.
- Information professionals, some of them trained librarians, who are hired directly by research teams and operate independently without appointment in the institution's library. They use library services and collections on behalf of other members of the team.

Librarians are discharging responsibilities in their capacity as teaching faculty. As members of curriculum committees, they influence general curriculum development and participate in, and some are activists in promoting, the school's information literacy agenda. Others, though not members of the curriculum committee, have an effective interactive role with educational policymakers. They teach stand-alone or collaborative courses on information retrieval, organization, and management as well as on evaluating the clinical literature. This activity is increasingly significant with the expansion of problem based learning courses in medical schools. While many librarians have academic or faculty appointments in the library, some have additional appointments outside the library—e.g., librarians at the University of Utah who also have adjunct appointments in the medical school's Department of Medical Informatics or in the College of Nursing; a librarian at Texas A&M with a joint appointment and split effort in both the library and the veterinary school.

Librarians are participating in institution-wide planning and administration. Some have assumed responsibility for administering nonlibrary programs such as academic computing, media production, learning resource centers, and institutional communications (e.g., Mount Sinai School of Medicine and the medical libraries at Cornell and George Washington University). At the University of Cincinnati, the library's director is now Associate Senior Vice President for Medical Center Information and Communications. There are joint programs with schools (e.g., University of Washington's Health Sciences Library and Information Center/Medical School Research Funding Service) wherein a librarian is employed by the medical school but reports jointly to the school and the library to provide a research funding information service. The oversight team for this collaborative venture consists of the Health Sciences Library's director, the school's Associate Dean for Research, and a senior faculty member.

Library directors have been catalysts and are facilitating collaboration among disparate institutional components. This is evident at several health sciences centers with federally funded IAIMS programs including Columbia University, Georgetown University, University of Washington, and University of Cincinnati. Participation by the library itself in the program is a partial fulfillment of the National Library of Medicine's clearly articulated expectation that the library will assume a significant role in planning and administering an institution's IAIMS program. However, library leadership of the project is not mandated.

The various populations with whom librarians now collaborate on IAIMS-related work include:

— computer center staff;
— faculty and researchers, with those engaged in informatics[3] research constituting a primary focus for IAIMS work;
— administrators, both university and hospital;
— hospital staff;
— clinicians;
— educational technologists;
— nonlibrarian professionals working in libraries;
— media producers; and
— computer programmers.

In addition, librarians' collaborative relationships are diverse and include:

— service on institutional committees;
— developing and delivering coordinated or joint services;
— planning and developing institution-wide policies;
— working on research projects;
— supervising nonlibrarian professionals;
— being supervised by nonlibrarians;
— membership in the institution's central administration;
— membership in a clinical teaching team (Cimpl, 1985; Schnall & Wilson, 1976);
— subject bibliographers in academic libraries; and
— constructing institutional databases—e.g., patient records.

Library services themselves are changing as the traditional directional information methods of librarians pointing users to the appropriate sources, but usually not providing answers, are giving way to services which deliver evaluated and synthesized information in response to queries (Fayen, 1986; Lemon, 1991; Molholt, 1990; Shirley et al., 1981).

Issues

In institutions in which libraries are engaged in IAIMS activities, a wide array of issues is emerging. Some appear to be universal and are familiar at almost all these sites. Many of them have broader ramifications that merit attention by the library profession as a whole. In this section, some of these issues are outlined. For convenience, they are grouped under four broad categories: organizational, personnel, other resources, and values and standards.

Organizational

How are the internal organizational structures of libraries changing in order to accommodate these new programs while continuing to provide standard library and information services to faculty, students, and other constituent user groups? What forms of management are effective? The organizations of some health sciences libraries have already changed, and further changes can be anticipated at others in the near future. At Johns Hopkins University's Welch Medical Library, the Knowledge Management Laboratory is a separate research and development unit under the overall library admin- istration umbrella. The purpose of the laboratory is to integrate the library more fully into the scholarly and scientific communication process. It is staffed by a multidisciplinary team of library and information scientists, software engineers, content specialists, social scientists, and an anthropologist. Lucier (1990) notes that this unique collaboration has raised important questions, and the future implications for libraries are not readily apparent at this time.

The library of the Oregon Health Sciences University no longer has a separate identity since its functions have now been incorporated as components of a larger organizational entity, the Biomedical Information Communication Center (BICC). The BICC, whose director is a physician, combines, in addition to the library, the computing center, telecommunications, audiovisual production, and photography and medical informatics research. These departments are organized into three main divisions: User Services houses library and other client-oriented services; Technology Services maintains the infrastructure, telecommunications, and the computing center; and Research and Development is the medical informatics research component. The library director's responsibilities have been broadened to include microcomputer sales, support, training, and photography and audiovisual services (Ash et al., 1990).

What are the implications for the future top leadership of the library, and what qualifications will be important in recruitment and retention of directors? Where the library includes a significant

informatics research unit, it may be reasonable to expect the institution to have, as director, a scientist capable of putting together a full academic program rather than a librarian to manage only the services. The library would then function as one component of such an organizational unit, and the library director who would lead the larger enterprise would be expected to have scientific academic credentials or, at least, demonstrated relevant experience.

How can libraries' traditional hierarchical reporting structures be successfully reconciled with the collegial relationships prevalent among faculty and researchers in organizational units in which librarians and researchers are expected to work together? Can management by both "direction" and "guidance" co-exist? A matrix management approach at Johns Hopkins organizes staff into program groups which interact and re-form, as needed, for particular aspects of the work.

As interest in IAIMS activity spreads in an institution during times of stringent budgets, library administrators may have to confront a quandary. Should a window of opportunity to move the library into a desirable nontraditional endeavor or a challenging collaboration be bypassed if library staffing is inadequate, either in terms of capability or quantity? This poses the dilemma of weighing the long-term vision of developing the library as a dynamic institutional presence and not risking it becoming the institution's book warehouse against the pragmatic need to meet current commitments. Furthermore, is it ethical, or even practical, to assign staff members to responsibilities for which they are not adequately trained in order to achieve a longer range library goal?

How far afield from the primary mission of the library should librarians get involved? Or, more importantly, what *is* the library's mission? IAIMS planning at some sites has resulted in a reexamination of not only the library's mission but also that of the health sciences center.

Libraries are generally administratively isolated in academic institutions, and they usually function as organizational islands. While their collections, facilities, and services are geared to meeting the needs of various constituencies that are dependent on them, their internal functions are quite discrete and, consequently, are intrinsically of little concern to others as long as there is reasonable satisfaction with service levels. Integrated institutional information management, as in IAIMS, perforce moves the library out of this traditional isolation and into a potentially vulnerable political position. A library director who plays a central administration role may be at significant risk when there is drastic change of top-level institutional administration.

Personnel

A library's centrality and leadership in the IAIMS program raises institutional expectations about the roles and functions of libraries and librarians. Yet libraries today do not generally have personnel capable of fulfilling such broader roles and face great difficulty in rising to meet these expectations. How can individual administrators and the profession as a whole develop librarians who can take their place as peers? Holding a Ph.D., while perhaps beneficial, is not necessarily the sure key to external acceptance. Some ways in which library administrators are fostering staff capabilities include providing effective role models and increasing delegation of both responsibility and authority. The profession can play a role by promoting the generalization of library knowledge and skills—i.e., the recognition that many abilities and principles which are accepted practice in libraries actually have generic value and are applicable outside of libraries. This is especially true in the area of library directors' administrative responsibilities such as the budget, personnel management, and recognition that the complexity of services and programs of many academic and health sciences libraries exceed those of many departments and even rival those of a number of schools on their campus. Another example is the application of cataloging standards and practices to other domains and thesauri.[4]

When librarians function as the true equals of other faculty in collaborative working relationships, staffing resources become further constrained by the amount of time devoted to meetings and other outside commitments. Management is also faced with revising criteria for appointment and promotion and the issue of librarians holding an academically respected degree—i.e., Ph.D. However, such work can be highly beneficial since it provides opportunities for librarians to learn to relate to faculty in other disciplines as equals through service on institutional committees, on external bodies, and on on-site visit teams. Among health sciences librarians, service on the National Library of Medicine's Biomedical Library Review Committee has produced the useful effect of establishing friendships and collegial networks among librarians and medical informatics researchers.

To what extent is it the responsibility of the library's management or of an individual staff member to assure that person's acquisition of new skills? As IAIMS programs are implemented, skills and knowledge that may not have previously been required—i.e., curriculum design, teaching methodologies, systems analysis and design, programming, grant-writing—become critical to the job performance of staff librarians.

How do librarians develop a level of understanding of the curricula of disciplines and professions other than their own—and

which they have not themselves experienced—that is sufficient to enable them to have credibility with other members of the relevant curriculum committee? Adjunct faculty appointments in departments in various health sciences professional schools are now being used as a mechanism to promote librarians' awareness of school and departmental activities and the joint development of instructional courses. They provide the added benefit of stimulating the librarians' appreciation of the importance and complexities of institutional politics. Such appointments can be an entry point to meaningful faculty interaction for librarians who do not have Ph.D.s, and they can be acquired most readily if the department recognizes that the librarian can make direct contributions to its program.

How do managers achieve an appropriate and equitable balance of time allocations for a staff member's commitments to provide library services and those to perform research and other activities beyond their primary position's description? Elitist attitudes can be manifested by those engaged in the newer and "sexier" activities, and deleterious competition may develop between these staff and others who are fulfilling more traditional roles. This can be exacerbated by differing personnel or by policies that are applied to those with dual appointments. In institutions where not all librarians have faculty appointments, differing pay scales may prevail among fellow professional staff. Likewise, some librarians may have fewer constraints on their schedules and greater latitude in allocating their time to nonservice activities.

How can mutual recognition and understanding about the substance and importance of each others' endeavors be promoted among librarians engaged in traditional service and those active in newer pursuits? Staff relations can be further strained by the presence of significant numbers of highly paid professional staff or faculty who work within library departments but who are not committed to library service per se. They were hired by virtue of their specialized subject or technical background which is not specific to library work.

As we contemplate proliferation and expansion of IAIMS programs, recruitment issues already under discussion in the profession are of increasing concern. The needs of IAIMS programs also underscore the difficulty of finding candidates with the required skills among those holding library degrees. This has led to the placement of librarians from accredited programs in positions for which they have had no directly pertinent formal education or experience. Libraries are also exploring different sources and methods to recruit the needed professionals and faculty who do not have a traditional library education or background.

Other Resources
     How can managers allocate resources to initiate projects and funding proposals without "starving" service commitments and

over-stressing services staff (thus further provoking their resentment of, and resistance to, moving into newer nontraditional endeavors). IAIMS planning and project implementation are enormously complex processes. In an active IAIMS environment, it is not unusual for library staff, and especially administrators, to be faced with multiple competing priorities among project initiatives. These can be likened to the child's carnival game of plucking the "winning" plastic ducks from the water before they float downstream. How does one choose wisely among the many opportunities that are beckoning?

Projects can easily take on lives of their own and compete with institutional needs for existing library services. How can managers monitor progress and provide the necessary checks and balances without stifling creativity? Other articles in this issue of *Library Trends* deal with this problem.

How can libraries get funding written into relevant research grants to support library and librarian involvement? The library is a natural environment for testing the new software products, databases, and interfaces developed by computing centers and informatics researchers. By offering to work with individuals preparing research proposals, the library can not only influence the directions of such projects but also receive funding to support testing in an authentic user milieu.

Values and Standards

On many campuses, insularity of librarians is prevalent, both among those working in libraries and in the faculty of library schools (Paris, 1990). Compared to faculty in other disciplines, there is generally less mingling and socializing with nonlibrarians, and few joint programs or joint degrees with other schools or departments are offered. Hall and Byrd (1990) explore the role of librarians in university governance, curriculum development, classroom and research, and they discuss the need for librarians to become "full citizens of their academic institutions" (p. 2).

The image of libraries and librarians cannot be ignored. There are pervasive negative stereotypes which frequently need to be overcome when a library or a librarian assumes managerial authority over others and when librarians begin to establish collegial or collaborative relationships with other professionals (Richards & Elliot, 1988).

As is pointed out elsewhere in this issue of *Library Trends*, different value systems prevail among professions. These can be manifested even in criteria used for assessment of staff performance. For example, medical informatics professionals may ascribe high value to technical knowledge, such as programming, and denigrate the management skills which are accorded a higher value among librarians.

Experience in one IAIMS institution indicates that the nonlibrarian professionals thrive on diversity of work, and they use problem solving to lead them to new projects. The librarians working with them, however, use their skills to solve a defined problem in a collaborative way but do not then go on to devise new problems to solve. Their approach follows the traditional reference desk model in which each question is unique and dealt with as such, and there is no attempt to generalize solutions for answering "classes" of questions.

Librarians are generally concerned about the larger institutional "good" whereas most clinical and research faculty focus on their own agendas and projects. This can be logically attributed to differences in sources of support. Librarians have a relatively secure funding base, with their salaries usually paid from institutional budgets. Faculty appointments in health sciences, especially in medical schools, rarely entail full institutional support. A portion of the funds that faculty bring in from research grants and/or patient care often constitute their major, and sometimes only, source of support.

As librarians and computer scientists work in tandem on networking and system development, emerging differences in their approaches can actually foster further joint endeavors. Scanlon (1990), in an article with the intriguing title "How to Mix Oil and Water: Or, Getting Librarians to Work with Programmers," observes that, in general, "computing and library professionals have very different personalities" (p. 320). He notes that according to the Myers-Briggs Type Inventory (MBTI), librarians are "literal, search for total solutions to problems, and place emphasis on authority." Computer programmers tend to "think linearly, tend to search for the best possible fit to a problem, worrying about exceptions as they occur, and place emphasis on knowledge as opposed to authority when seeking answers" (p. 320). He suggests ways of developing a common professional ethic for the two groups, one which focuses on delivering excellent service to the user community and capitalizes on the unique strengths of the two groups.

While librarians have long recognized their need to rely on the technical expertise of computing center staff, the corresponding need for complementary library expertise was generally not obvious in advance. There is, however, anecdotal evidence of a growing recognition among at least a few directors of computing centers that it is easier to teach technical consulting to librarians than it is to teach systems staff to be user oriented. As some have been exposed to librarians who are trained to interview others about their information needs and who look at systems from the user's perspective,

they recognize their value for computer user services and have accepted librarians' assumption of that role.

CONCLUSION

This article has focused on health sciences librarians and their role in the larger IAIMS process. The body of experience that has developed since the start of the National Library of Medicine's IAIMS program in 1983 has been substantial. The enthusiasm with which librarians, faculty, clinicians, and administrators alike are greeting the planning and implementation process in IAIMS institutions has surprised even many of the program's early advocates. The creation of a shared vision and development of goals and objectives has provided individuals with a road map for the future as well as a mechanism for breaking down barriers, both real and imaginary, to the sharing of information resources. As a result of IAIMS initiatives and the increasing national emphasis on connectivity and information access, academic and research libraries are emerging as one of the key way stations on the electronic highway for hospitals, academic health sciences centers, and indeed, the university as a whole. Faculty and clinicians who had never perceived their need for a computer, or, if they did use a computer, saw no reason for connecting it to other computers inside and outside the institution, are now clamoring to be connected in order to access the myriad of databases available via networks.

Librarians have emerged as leaders in this process in several institutions for at least three reasons. One is that they are regarded as neutral entities in the health sciences center with no particular self-serving axe to grind. The second is that librarians have an aptitude for process, a forte which Veaner (1990) has described as "process knowledge," the capacity to resolve problems that are not neat or well formed (pp. 61-62). These are exactly the types of problems faced daily by academic health sciences administrators and faculty in creating and managing information systems. The third reason is that librarians have valuable information organization and retrieval skills which, until recently, were undervalued and ignored. Many faculty and administrators have long perceived, and sometimes asserted, that running a library was "easy." It was not until clinicians and information systems designers began to develop online patient record databases that the complexity of reliably indexing, organizing, and retrieving information from those records was appreciated. Thus dawned their recognition that thesaurus construction, indexing, and database design were exceedingly valuable skills and the discovery that it was librarians who possessed them.

There are several broad issues that merit resolution and thus the attention of the library profession as a whole. Primary among them is that of generating a pool of qualified staff. Where will an

adequate number of individuals who can fill these new and challenging roles be found? It is ironic that just when the library profession is beginning to be recognized for the major contributions it can make beyond library walls, fewer and fewer schools are available to educate future librarians. How can library school curricula and continuing education opportunities be designed to teach students to prosper as members of interdisciplinary teams in this new environment? How will libraries and librarians be defined in the future (Anderson, 1989)? Will these newer roles continue to be filled by librarians? Will libraries lose their distinctiveness as they merge into larger, somewhat amorphous, entities such as computing and communications centers?

With regard to the organization of the library itself, will there be more widespread adoption of matrix management in which groups of librarians, with both technical and public services backgrounds, work with faculty from a variety of disciplines to create databases and other information resources? What will happen to libraries and, especially, library administrators who are unable to assume broader responsibilities and contribute significantly to information systems planning? If an institution recognizes its needs for IAIMS-like development and librarians do not assume leading roles, it is highly likely that the void will be rapidly filled by others.

In the last few years, reporting relationships of some academic health sciences libraries have undergone major shifts. In some cases, the library has been moved closer to the center of the health sciences, or medical school, administration. In others, the library has been subsumed within another academic unit such as a department of medical informatics. Are these kinds of changes in reporting relationships relevant to general university libraries? Will they function as positive or negative models? Again, these questions reflect changes in the broader context of research libraries.

To date, there has been much interest in the IAIMS model in the broader university environment, but it is too early to determine the extent to which it will transcend the health sciences center and be adopted there. Gloria Werner (1983) addressed this issue when IAIMS was in its infancy, stating that the Matheson Report's "principles, recommendations and even some of the scenarios apply directly" to the entire university. She explored some of the similarities and differences between university research libraries and academic health sciences libraries and noted concerns of university research library directors who are "maneuvering to take advantage of information-age opportunities" (p. 417). Eight years later, we believe there is much to be learned from the experiences of IAIMS institutions, and that much of what has been learned *is* transferable to the broader

academic environment. Librarians have an important role to play
in creating a vision of future information systems for the entire
university and extending beyond its boundaries. In order to capitalize
on this opportunity and to foster credibility in the larger institutional
environment, librarians will need to be prepared to deal creatively
and expeditiously with a range of issues that challenge traditional
approaches to personnel and management structures.

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Grant No. LM05050 from the National Library of Medicine. Its content is solely
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[2] For an overview of NLM's IAIMS program see West (1988). Outcomes of the planning
phases of the first ten funded projects are reported in Broering (1986a) and Matheson
(1988). For detailed work plans of the first two institutions funded by NLM for full-
scale implementation, Georgetown and Columbia Universities, see Broering (1986b),
and Anderson and Clayton (1990).

[3] " 'Medical informatics' is the name given to the academic disciplines that seek to
organize and manage information [both published and unpublished] in support of
biomedical research, education and patient care....But medical informatics is more
than medical computer science, for it draws upon cognitive and educational
psychology, decision analytic theory, and other disciplines that are more mindstuff
than technology. The major applications domains of medical informatics are:
computerized data bases, clinical records systems, computer-assisted medical decision
making, computer-based medical education" (Masys, 1989, p. 13).

[4] Humphreys (1990) posits that the relatively mature library system standards can
be useful for medical informatics research, not just for applications related to accessing
the literature but applicable also to other types of biomedical information.
Bibliographic data share some of the complex characteristics of clinical data and
may be helpful in identifying the range of standards to be considered for clinical
areas. Medical informatics is in its infancy regarding standards.

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