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Leveraging institutional partnerships and individual expertise to support translational science: an extension of the informationist model

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LEVERAGING INSTITUTIONAL PARTNERSHIPS AND INDIVIDUAL EXPERTISE TO SUPPORT TRANSLATIONAL SCIENCE: AN EXTENSION OF THE INFORMATIONIST MODEL

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Abstract

In Fall 2009, the Health Sciences Libraries (HSL) and the Institute for Health Informatics (IHI) at the University of Minnesota jointly recruited a new position titled Translational Science Information Specialist and IHI-Library Fellow to serve as library liaison to the University's Clinical and Translational Science Institute, to co-direct the graduate program in health informatics, and to leverage expertise to support University-wide initiatives in E-Science and data services. The position built on experience with and commitment to the concept of "informationist". This paper reports the opportunities, challenges and evolving critical role of the Information Specialist as "curator" and "translator" of health data and information among many different organizational entities and community partners.

Keywords: health informatics, informationist, information specialist, translational science

Introduction

In order to provide optimal service in support of a university's mission, the information and knowledge needs of its users must be well understood, never more so than in a climate of changing scholarly information use practices (Schonfeld & Housewright, 2010). European academic libraries have long embraced the subject specialist role within the University to engage with disciplinary faculty, as have libraries in the United States (Hay, 1990; Williams, 2010). In the health sciences, the liaison librarian model for service delivery is now common (Tennant, Cataldo, Sherwill-Navarro, & Jesano 2006) and in patient-care settings, clinical medical library programs have a long tradition of direct librarian support of clinical teams. In 2000, Davidoff and Florance coined the term "informationist", proposing a new type of professional to support information services in clinical settings. The definition of informationist has varied, but is commonly understood to mean an information specialist-in-context; an individual who has both domain knowledge and information management skills to apply in the settings of healthcare, public health, and biomedical research. Clinical librarianship is still the most common application for health sciences libraries, with increasingly sophisticated application at institutions such as Vanderbilt University (Guise et al., 2005) and in the United Kingdom (Ward, 2004).

Over the past decade, the concept of informationist has received widespread discussion and subsequent extension to more diverse environments. For example, the library at the U.S. National Institutes of Health has developed strength in developing informationists, specifically to support researchers (Whitmore, Grefsheim, & Rankin 2008). Bioinformationists and public health informationists are other extensions (Rein 2006; Lyon, Tennant, Messner, Osterbur & 2006; Oliver et al., 2008). A systematic review of 113 papers conducted by Rankin, Grefsheim and Canto in 2008 synthesized much of the thinking and debate among stakeholders around education and qualifications, roles, settings, success factors and barriers to success. The authors noted support of the informationist role by the Medical Library Association (MLA) and by the National Library of Medicine (NLM) which funded nine informationist fellowships from 2003-2009 along with its larger biomedical informatics fellowships program. They concluded that the informationist role was still in early adopter mode and that regardless of the model adopted within a particular organization, domain knowledge, continuous learning and the idea of "embeddedness" (e.g. in context) were key.

In 2006, the National Institutes of Health launched its Clinical and Translational Science Awards (CTSA) program with a goal to improve the way biomedical research is conducted and to accelerate the translation of discoveries in the laboratory into treatments for patients. As of early 2010, the network included 46 medical research institutions in 26 states (Califf & Berglund, 2010). Other institutions have embraced the vision of CTSA by reorganizing their clinical research operations to reduce the time from "bench-to-bedside and bedside-to-community" and to support the training of clinical and translational researchers. The University of Minnesota is in this latter category with its Clinical Translational Science Institute (CTSI), established in April 2009. The CTSI provided a laboratory in which to explore the informationist role at the University of Minnesota.

Background and Setting

The University of Minnesota (UMN) Twin Cities in Minneapolis and St. Paul is among the largest public research universities in the United States, part of a five campus University of Minnesota presence throughout the state of Minnesota totaling 67,000 students and 4,100 full-time faculty. The University's Academic Health Center (AHC) is comprised of six professional schools including the Schools of Dentistry, Medicine, Nursing, Public Health, Veterinary Medicine and the College of Pharmacy. The AHC is also inclusive of allied centers and institutes; one of the interdisciplinary institutes of the AHC is the Institute for Health Informatics (IHI), which serves as the University's hub for health informatics research, graduate training, and infrastructure design and development. The IHI is also leading the biomedical informatics (BMI) function of the CTSI.

The University is served by an extensive Universities Libraries system of which the Health Sciences Libraries (HSL) is a part, with significant shared technology infrastructure, collections and staff collaborations. HSL has a staff of 40 FTE among which are 6 liaison librarians serving the professional schools. In the summer of 2009, the directors of the Health Sciences Libraries and the Institute for Health Informatics recognized an opportunity to create a new "informationist" liaison position that would engage directly in the work of clinical research through the IHI and the CTSI. The informationist concept has been successfully tested at the University of Minnesota with a two-year public health informationist fellowship funded by the National Library of Medicine at the HSL. The University Libraries had previous experience in recruiting librarians who also had doctoral degrees in a science domain, and is beginning to develop an organizational structure to support growing university and library interest in E-Science. In 2008, the "E-Science and Data Services Collaborative" was formed (Delserone, 2008), and recent planning efforts have broadened the concept to "E-Scholarship". The "Translational Science Information Specialist" position is an extension of these experiences.

Defining the Role of Translational Science Information Specialist

Because of the multi-faceted nature of this role, several required qualifications were listed in the role description that reflect the informationist model, including the need for a Ph.D. or other advanced degree in a life science or clinical discipline, a Masters degree in library or information science (or equivalent information management experience in an intensive research environment), and the ability to work collaboratively and interdependently across multiple disciplines. Experience with science research, publication trends, and data stewardship was also required. To ensure success, the role also required an individual who was technologically savvy and understood the application of technology in academic, clinical, and research contexts. It was also recognized that certain soft skills were required in this role, including the ability to manage ambiguity with ease, a high level of comfort in working with multiple individuals and groups with differing goals, and a high level of confidence and self-awareness to allow for effective interactions with internal as well as external institutional partners. In addition to required qualifications, several preferred qualifications were outlined for this role, among which were familiarity with the design, conduct, and dissemination of qualitative and quantitative research, successful grant writing, and involvement with relevant professional activities.

The primary responsibilities of the Information Specialist included a hybridized model that would serve the needs of the University of Minnesota Clinical Translational Science Institute and other AHC researchers through a dual appointment in the Health Sciences Library (70%) and the Institute for Health Informatics (30%). Funding for this new position was achieved through coupling UMN AHC institutional funds with federal stimulus dollars available through the American Recovery and Reinvestment Act. Many of the knowledge-based initiatives associated with the role were designed to provide networking platforms and information capture systems to ensure the intuitive translation and communication of research results. Major responsibilities of the role are highlighted in Table 1.

Table 1. Responsibilities of the Translational Science Information Specialist role and key user groups.

Role	Key User Group(s)	Responsibilities
Translational Science Information Specialist	CTSI, AHC researchers	Provide knowledge management support, current awareness, and access to relevant content to CTSI and other translational science researchers, serve as Health Sciences Libraries Liaison and ensure knowledge exchange with HSL and University Libraries staff and management
IHI-Library Fellow	IHI Faculty Fellows, Staff, Administration and various users and groups supported by IHI, extramural funding agencies	Share scientific, informatics, and information management expertise, web strategy and design, input for grant submissions, relationship building for internal and external users, program leadership, current awareness services
Associate Director of Graduate Studies, Health Informatics Graduate Program	Health Informatics Graduate Students, Faculty, and Administration	Evaluation and recommendations for process, curriculum, admission, and student progress, coordinate graduate research fellows program, online course development, advise Ph.D. students, lead the development of Graduate Studies Strategic Plan, ensure Graduate School compliance

Translational Science Information and the Clinical and Translational Science Institute

The role was crafted with the intention of providing significant services to the CTSI program, and it was generally understood that the primary function of the role would be CTSI-related. Because the activities and mission of the CTSI are very broad, particular attention was required to focus the role of the Information Specialist. To avoid dilution of effort, directors of the Health Sciences Libraries and the Institute for Health Informatics, together with the Information Specialist, held biweekly, hour-long meetings to discuss current activities, strategies to meet evolving needs, and to plan for future needs. A significant portion of most meetings was dedicated to brainstorming and the use of mind-mapping techniques to assist in the identification and prioritization of activities and to provide a foundation for discussing performance objectives.

Support for the CTSI and CTSI Researchers

Because the CTSI had only been established about six months before significant informatics and Information and Knowledge Management activities were focused on the institute, there were many opportunities to impact the organization and design of the CTSI website and its resources. One of the approaches used to simplify access to CTSI-related services and resources was the concept of the Front Door. The Front Door serves as an entry point for clinical and translational science researchers to the Clinical Translational Research Services functions and cores, as well as CTSI offices and programs. It is the centerpiece for CTSI communication, education, research, and collaboration tools. Resources from every facet of the research life cycle are available via the Front Door, including grant information, access to research reagents, financial and budgeting tools, information for contacting the CTSI for consulting services, biostatistics services, reference management, publication resources, and more.

After the HSL conducted a survey of CTSA and CTSA-minded organization websites, it was determined that none of the websites provided tightly-integrated access to published resources typically made available through an institution's biomedical or health sciences libraries. We proposed that an integrated information resource would be a valuable addition to the list of CTSI resources and CTSI web managers agreed that access to such resources would provide significant value to CTSI researchers. A Clinical and Translational Science Library Resources page was designed with the input of liaisons from the Health Sciences Libraries. The format followed a standard that is used for dozens of specialty resources pages at the UMN and can be found at (http://www.biomed.lib.umn.edu/guides/clinical-and-translational-science).

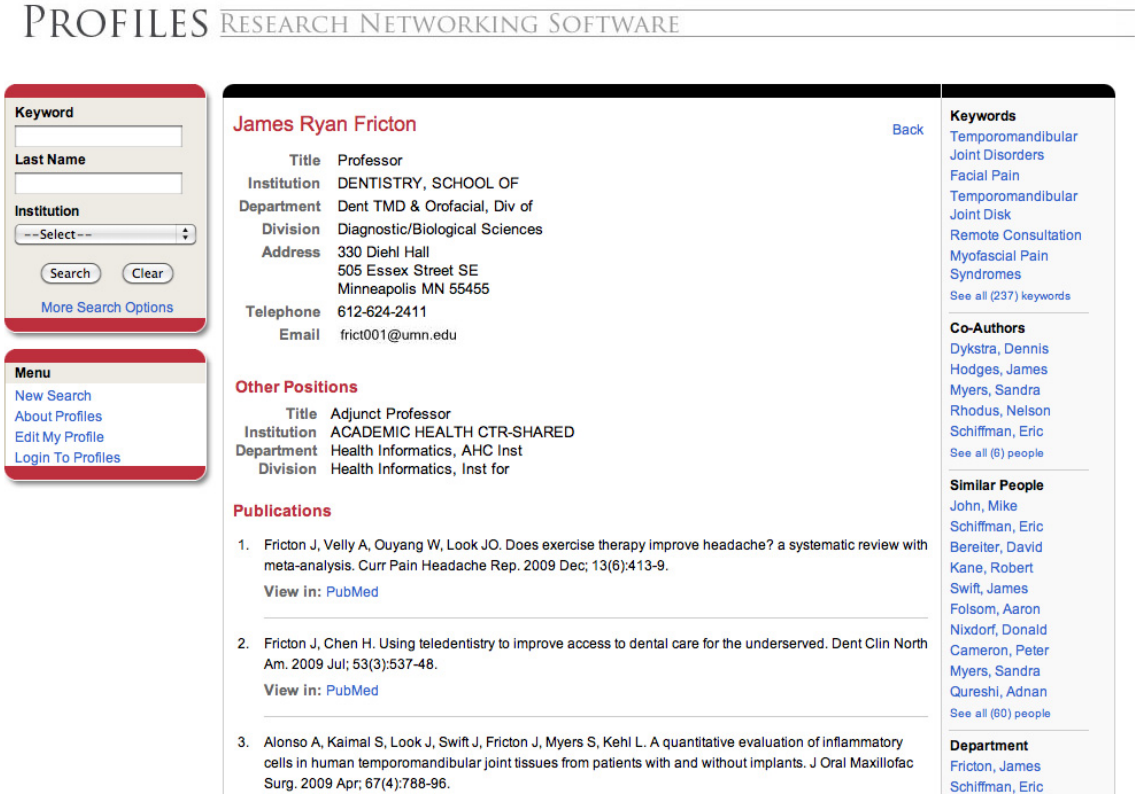
Other CTSI website design enhancements were implemented after web design experts from the Health Sciences Libraries were recruited to review and critique the development of the updated CTSI website. This exercise, which could be considered matter of course by many, led to numerous significant improvements to the site design. In addition to design improvements, the HSL web team also suggested search engine optimization so that online searchers looking for the CTSI website homepage could now find it listed first among search results.

In 2009, the CTSI BMI Function made the decision to implement the platform underlying Harvard Catalyst's Profiles professional networking tool and to integrate it with other resources available through CTSI. Profiles uses algorithms to connect individuals who share common traits such as research interests, co-authorship, department affiliation, or office co-location. The technology integrates data about researchers from HR directories, public and private directories, and publication information, including Medical Subject Headings (MeSH) from PubMed. Profiles allows users to modify their individual profiles and expand their network by adding publications, other relevant information sources and new contacts that are not discovered automatically. An individual Profile record is displayed in Figure 1.

The open source Profiles software was developed by Griffin Weber, MD, PhD, chief technology officer of Harvard Medical School. Discussions with Dr. Weber regarding the implementation of Profiles at UMN commenced in 2009. Since Profiles has also been implemented at the University

of California, San Francisco (USCF), contacts were made via the UMN Health Sciences Libraries and the UCSF Library and Center for Knowledge Management and follow-up discussions about implementation and rollout have been held on an ongoing basis.

Figure 1. UMN Profiles record featuring primary directory and demographic information, relevant MeSH data, coauthors, similar experts (based on MeSH), neighbors and representative citations from PubMed.



The role of the Translational Science Information Specialist in the setup, customization, data loading, data curation, implementation, rollout and strategic direction of Profiles has been significant. The initial core list of researchers was selected by the Information Specialist and provided to Harvard. With the assistance of a UMN Ph.D. student who is performing research in the area of Knowledge Management and its application in Health Informatics and Translational Science, a phased implementation of Profiles will commence in early summer, 2010. Later in the year, UMN Profiles will be enhanced with the addition of information resources important to AHC researchers. By the end of 2010, it is expected that Profiles will be rolled out to the entire AHC research community.

Support for CTSI Partners

The AHC Office of Education collaborates with AHC faculty and members of the Minnesota community to introduce innovations in health care education. The office helps faculty, students, staff, and administrators develop new skills and cross traditional boundaries between the health profession schools so that they are prepared to work in diverse, community-based settings. In the CTSI context, the AHC Office of Education provides leadership for the Education, Training and Research Career Development (EdTRCD) Program. EdTRCD is a comprehensive, integrated, flexible resource that engages a broad and diverse spectrum of learners and empowers them to pursue clinical translational science throughout their careers.

The Information Specialist has played a key role in helping EdTRCD achieve its overarching goal of providing supportive infrastructure to allow dialog between training and mentoring programs. Specifically, the Information Specialist has introduced the EdTRCD Steering Committee to Profiles Professional Networking Software and that the committee recognizes the utility of this tool for providing support to faculty and student mentoring programs and for accessing experts based on training grant information. Collaborative work with the AHC Office of Education has resulted in the design of an Introduction to Health Informatics online module for the CTSI Clinical Research Methodology website which orients users to various aspects of clinical research. The intersection of the education, health informatics and health sciences libraries has allowed for open discussion and leveraging of each organization's innovations to enhance the education of CTSI researchers.

The Office of Community Engagement for Health (OCEH) assists University researchers, healthcare organizations, and communities throughout Minnesota to work together to identify crucial research questions, develop and carry out studies to answer them, and apply the results to enhance health and reduce health disparities. In this role, the Translational Science Information Specialist can draw upon the Health Sciences Libraries' previous public health informationist experience, which included a number of community outreach initiatives. The OCEH plays a critical role within the CTSI, particularly in T3 (involves translation from recommendations or guidelines into practice) translational activities. Initial interactions between the Translational Science Information Specialist and the OCEH have focused on the needs of the pediatric patient base. An extensive database containing child healthcare grant information is currently being reviewed and data are being curated for integration into future versions of the Profiles Networking Software platform.

An essential role of the IHI is community engagement across the University, State of Minnesota and the upper Midwest region that is centered on health informatics infrastructure, research, and education. This involves a diverse collection of stakeholders including health systems, community health collaboratives, medical device companies, technology companies, the State of Minnesota, professional organizations and institutions of higher education, to name a few. As is typical, there are often competing interests and multiple viewpoints. The Information Specialist role is critical to managing such complex relationships by enabling stakeholders to capture and use all available data and information to collaborate and make informed decisions that benefit the collective whole. In way of illustrating this point, the IHI was recently awarded over $5 million by the Office of the National Coordinator for Health Information Technology (IT) to develop a multi-institutional consortium across the State of Minnesota to deliver short-term (6-24 months) health informatics training in vital health IT roles for rapid workforce infusion. The Information Specialist, an investigator on the grant, serves a pivotal role in this endeavor by bringing to the consortium expertise in data stewardship as well as in the application of technology to academic, clinical, research, and corporate contexts.

Integration of Translational Science, Informatics, and Library Science

The fundamental value that an informationist provides is that of understanding and then translating the information needs of various user groups into services and tools based on familiarity and even immersion in the user environment. Within the Health Sciences Libraries, librarian liaisons serve as the primary conduit of communication between HSL and the faculty, students and staff. Liaisons support the teaching, learning, research and service missions of the AHC and UMN by developing and nurturing strong connections with the academic, clinical, research, and collegiate units. The goal of the liaison program is for librarians to be regarded by the AHC as indispensible members of the academic, clinical, research and collegiate units. Because this operational model had already been established, it was relatively easy for the Translational Science Information Specialist to engage in with the liaison network and apply many of its practices to the CTSI and related groups. The Information Specialist regularly attends meetings of the liaisons to exchange knowledge about AHC activities, to learn about new library services and resource, and to ensure collaboration with other liaisons in the program. The existing liaison network has also allowed

several of the HSL liaisons to contribute to the support of the CTSI because of the strong relationships that have been built throughout the AHC.

The Information Specialist has also been involved with the strategy development and planning activities with managers and staff from across the University Libraries systems. In particular, he co-convened an effort to define the Libraries role in E-Science and E-Scholarship. By working in conjunction with the E-Scholarship planning committee, the group helped developed a goal which proposes that libraries will provide life-cycle management solutions for digital content through engagement in strategic partnerships, leveraging of Libraries' (and campus) assets, developing and sharing expertise, and collaborating to develop essential infrastructure. In addition to the involvement with the University Libraries E-Scholarship planning, the Information Specialist has also interacted with the University's cyberinfrastructure initiatives and has contributed to the university-wide initiative to select a web-based system to manage critical information pertaining to faculty productivity, assessment, and accreditation.

Two other responsibilities of the Translational Science Information Specialist deserve mention as perhaps unique to the circumstances of his dual appointment. In the role of the Institute for Health Informatics-Library Fellow, the Information Specialist actively contributes to on-going research projects in IHI and is involved with grant preparation for future research projects, which could include HSL librarians as well. As Associate Director of the Health Informatics Graduate Studies Program, he has administrative responsibilities to ensure that admissions, curriculum and student progress programs are being run effectively. The program offers MHI (Masters in Health Informatics, a degree tailored to the needs of healthcare professionals), M.S. and Ph.D. degrees and has a long-standing tradition of training some of the top Health Informatics professionals in the world. The Information Specialist has led initiatives to enhance the Graduate Fellows Program and has helped to coordinate the development of web functionality to enhance recruitment and admissions processes.

Future Directions

During the first months in this role, the Translational Science Information Specialist has provided consistent, value-added information and knowledge management services to help enhance accessibility to CTSI resources. A large measure of this value derives from domain knowledge, information management expertise and daily engagement with CTSI leadership teams – core concepts for an informationist. Once the initial implementation of Profiles is underway, it is likely that interactions with CTSI researchers will increase, thereby increasing the visibility of the role and the resources that the role can provide to users. Future directions include a focus on the needs of researchers who are part of the UMN Biomedical Discovery District, including such groups as the Stem Cell Institute, Center for Infectious Diseases and Microbiology Translational Research, the Center for Immunology, and the Institute for Translational Neuroscience.

Further integration of the Information Specialist role with the E-Scholarship planning activities of the University Libraries will incorporate certain aspects of the CTSI, including interdisciplinarity, collaboration beyond institutional borders, and exploitation of technology. Potential strategies include addressing program and infrastructure development, developing skills and capacity within the University Libraries organization focusing on the data-sharing needs of the institution and developing business plans based on collaborations.

In 2008, Rankin, Grefsheim and Canto describe the informationist role in "early adopter" mode. In 2010, we are perhaps further along the spectrum of increased acceptance of the value of an informationist in multiple settings, but we are still seeking ways to scale this engagement beyond individual experiments. It is an important professional discussion to pursue collaboratively as new models and best practices emerge to guide future services to and support of our institutions' missions.

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