The Diffuse Library Revisited:
Aligning the Library as Strategic Asset

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Abstract:

Purpose: Originally a keynote speech to the 9th International Bielefeld Conference exploring the shifts in roles evident in the research library community, with illustrative case studies from the University of Minnesota Libraries.

Design/methodology/approach: A review of environmental forces that are fueling changes in research methodologies and scholar behavior. Changes in research library roles are explored in the context of three case studies, highlighting new forms of engagement with the scholar community.

Findings: Three University of Minnesota Libraries' initiatives illustrate: the use of behavioral data to design a customized discovery environment for scholarship, new organizational constructs to engage the community in issues related to control of scholarship, and strategies to develop a virtual community in the field of bioethics.

Originality / value: The paper presents the original perspective of a University Librarian of a large research library and draws on earlier analyses of research behaviors, technology, and research library roles.

Paper type: Case Study

Keywords:

Strategic positioning
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Scholarly communication
Virtual community

Is the library's future in incremental change or transformation? This question is raised with increasing urgency, often in the context of economic exigencies, technology's opportunities, or challenges by a growing number of competitors in the information arena. The question has merit, but I'd like to suggest that the core question is less about strategy (as the focus on change suggests) and more about role. Where is the research library best positioned to distinctively contribute and to make a difference? Can traditional roles simply be stretched within an increasingly digital context? How does a library conceive or re-conceive its role?

In my subtitle I've referenced the value of "alignment," the process of ensuring that there is coherence between the library's identified roles and the prevailing or emergent needs of the academy and the institutional context. This principle is increasingly salient as the library role is re-defined and shaped. In the case of the University of Minnesota Libraries, the period of the last several years coincided with a significant period of strategic positioning for the university— a formal, multi-year process of focused assessment and identification of aspirational goals for a large, public institution.

The other key words in my subtitle are "strategic asset." All in the profession aim to serve the needs of our relevant institutional communities. The notion of seeing the library as a "strategic asset" affirms that the library needs to be instrumental in advancing an institution and its goals. The "strategic asset" construct helps us appreciate that the library's expertise and resources can be *leveraged* and that the library can play lead roles in enabling an institution's goals. We're not in the business of passive support.

The framing concept for my remarks relates to *paradigm shift.* The landscape for our organizations has changed in myriad ways. There have been a number of critical developments in the environment and concurrent, related behavioral changes in our communities. Distributed and social technology forces prevail. The 1990's focus on "killer apps" has given way to a recognition that there are – and will be – countless developments (big and small) over time to be assessed and integrated. Organizational agility and technological facility will be essential to exploit opportunities as an ongoing strategy. We have also come to appreciate the new capacities we have to leverage our assets for diverse interests; the long tail is now part of our service agenda.

To begin, I will highlight the critical forces that I believe are challenging traditional roles of libraries and discuss the nature of the paradigm shift well underway. Then, to shed light on the question of roles in the context of these forces, I will turn to one institution's journey in forging new directions and reallocating resources to ensure alignment with the academy and our institution. Three case studies of initiatives within the University of Minnesota Libraries will be presented to explore the dimensions of change within a large organization and offer examples of strategies to realize new roles.

1. Diffuse Libraries

In 2002, I authored a white paper for the Council on Library and Information Resources entitled *Diffuse Libraries* (Lougee, 2002). The paper crystallized my thinking about the two key forces we experienced in the early 1990's – distributed technologies and open paradigms. The concept of *diffuse library* recognizes that the information universe is now highly distributed and the library is no longer the center of that universe. In addition, the "open" models that were nascent at the beginning of the century are now far more robust – everything from open access, to open source, to open knowledge networks, to open communities. In essence, open models are characterized by collaboration and mechanisms to share intellectual assets that are less restrictive and intentionally advance the creation of new knowledge.

In that paper, I offered a description of future emphases for libraries:

> With the incorporation of distributed technologies and more open models, the library has the potential to become more involved at all stages, and in all contexts, of knowledge creation, dissemination, and use. Rather than being defined by its collections or the services that support them, the library can become a diffuse agent within the scholarly community.
>
> (Lougee, 2002, p. 4)

Since that paper, there have been other similar concepts advanced – for example, the notion of *embedded libraries*, providing research and knowledge management services in context or *engaged libraries* with a focus on collaborating within a community. Within the medical library community, *informationists* offer a new model of professionals with domain expertise and information roles situated in the context of a research or clinical community.

These two forces – distributed technologies and open models – in tandem have prompted a culture in which a freer and more democratic exchange of knowledge assets prevails. A third trend, not yet palpable in 2002, is captured in the social forces that are now pronounced in the online environment. Wiki's, blogs, and social-network sites offer new dimensions for sharing and communicating. The so-called "wisdom of crowds" (Surowiecki, 2004) is represented in new contexts in which contributors add value and collectively leverage each others' contributions toward some goal. Social forces and the contexts in which they occur lay the groundwork for online communities, one of the themes I want to explore in more detail later in these remarks.

The bottom line is that a diffuse library is no longer the archive that deals primarily with the *products* of scholarship, rather there is a role to be played in all aspects, in all stages, of the *processes* of scholarship.

The evolutionary forces at play are evidenced in a number of shifts in the library's focus:

- *From publications to process:* The library's traditional role as archive for publications has been stretched to support the entire process of scholarship, and with that focus have come new roles. The imperative of understanding research processes has become clear as libraries develop infrastructure to support the full spectrum of research tasks.

- *From collections to expertise:* As information becomes more ubiquitous and the producers and managers of content more diverse, the library has experienced a shift from a collection-centric model to one that capitalizes on expertise. Librarian skills in information management, curation, information discovery, information literacy, intellectual property, and preservation are among the critical assets to be shared and leveraged in the knowledge-based context of the academy.

- *From access to sense-making:* Libraries have played a foundational role in providing access to knowledge resources. While in the past that role was carried out primarily through mechanisms of description and control (such as cataloging and classification), in the emergent network environment the library is challenged to make sense of a distributed and often chaotic information universe for particular communities of users.

- *From mediation to enabling:* Library roles as service providers have often been focused on mediation between a user's expressed need and collections. As library users now interact with a highly distributed, network environment, the library has actively deployed systems and tools to facilitate the user's independent activity – that is, to add value to the individual's research processes. Examples of enabling tools include services such as open URL link resolvers (to enable seamless connections between resources), tools such as Zotero (to help an individual manage and optimize the inquiry process), or recommender systems to expose the user to relevant resources based on users with similar interests.

- *From local to global:* A profound shift is taking place within the academy as individual scholars are able to collaborate on a global scale. This is an arena where universities are increasingly investing in collaboration infrastructure and where the library community is not yet fully engaged. We do not have robust mechanisms in place to serve global communities with ease. While there is some evidence of change – for example in cooperative, virtual reference services – libraries remain generally focused (and funded to focus) on serving local clientele.

The cumulative impact of these altered perspectives is significant and, I would argue, has critically altered the roles and strategies that libraries embrace.

2. A New Paradigm

Whether we characterize the emergent library as *diffuse, embedded,* or *engaged,* there is clearly a fundamental change in library roles taking shape. These shifts have been brought about by cumulating landscape forces and fueled by the concurrent changes in scholar

behavior. The impact of these changes is evident in the contexts in which we are engaged, in the agendas of our organizations, in the premium skills of our profession, in the tools we employ, and in the priorities for allocating our resources. Simply stated, we are experiencing a critical *paradigm shift*.

For many of us, we came to understand the notion of paradigm shift through the work of Thomas Kuhn. In his book, *The Structure of Scientific Revolutions* (Kuhn, 1962), Kuhn describes the precursor to these shifts, namely a growing sense of anomalies as traditional practice becomes less effective. Kuhn notes:

> Sometimes a normal problem, one that ought to be solvable by known rules and procedures, resists the reiterated onslaught of the ablest members of the group within whose competence it falls… revealing an anomaly that cannot, despite repeated effort, be aligned with professional expectations… And when it does – when, that is, the profession can no longer evade anomalies that subvert the existing tradition of scientific practice – then begin the extraordinary investigations that lead the profession at last to a new set of commitments, a new basis for the practice of science.
>
> (Kuhn, 1962, p. 6)

A paradigm is a "conceptual or methodological model underlying the theories and practices of a science or discipline at a particular time; (hence) a generally accepted world view" (OED Online, 2009). The world view for libraries across decades of practice has been defined by well-bounded collections, controlled descriptive practice, and a generally reactive mode of service. While clearly the library has always been attentive to changing needs of the user community, it has nonetheless been somewhat removed from that community. The library was a go-to place, a context for structured collections and consultation.

The contemporary information universe presents anomalies for traditional library practice. Ubiquitous digital content, functionally rich systems and tools, and globally distributed users abound. The digital age has prompted new research methodologies, new modes of learning, and expectations for seamless discovery and access. Numerous studies have documented the changes in scholars' information seeking preferences, highlighting that the library's status as go-to place has been seriously diminished or possibly lost. As Abby Smith so aptly concludes, "Whereas libraries once seemed like the best answer to the question 'Where do I find…?' the search engine now rules" (Smith, 2008, p. 13). OCLC's Lorcan Dempsey puts it more succinctly "discovery happens elsewhere" (Dempsey, 2007).

The contemporary library paradigm is not simply a migration of old models into a digital context. Rather, the re-conception of roles is essential. Using the example of Copernicus and his assertion that the earth rotated around the sun, Kuhn comments: "Copernicus' innovation was not simply to move the earth. Rather, it was a whole new way of regarding the problems of

physics and astronomy, one that necessarily changed the meaning of both 'earth' and 'motion.'" (Kuhn, 1962, p. 148). Similarly, the library must grapple with the changing dynamics (physics) of users, information producers, and service providers. If the library is no longer the center of the scholars' universe, then what paradigm has replaced that library collection-centric view?

What are the fundamental roles of a diffuse or engaged library? In what ways can it contribute strategically to the goals of the academy and of individual institutions? How can it sustain relevance and add value amidst myriad other players and competitors? Answers to these questions are crucial in defining the new library paradigm.

3. The University of Minnesota Libraries

Let me turn now to the case of a single library organization and its re-interpretation of roles. In the last 5 years, the University of Minnesota Libraries have benefited from a comprehensive process of institutional strategic positioning through which the university community identified critical priorities. The positioning effort engaged the campus broadly, addressing core issues surrounding the structure of colleges, the evolution of disciplines, and academic priorities. Strategic themes emerged: student learning outcomes, agile and robust research infrastructure, and interdisciplinary and collaborative scholarship. Framing the process was an aspirational goal to increase the stature (vs. ranking) of the institution, with attention to position and impact.

The Libraries planning process was informed and enriched by the institutional positioning. A key step in the process was a re-framing of the Libraries vision and mission. The contrast between the new and old statements is marked. The 2002 vision has a library-centric worldview, a continued sense of the library's commanding, central role. The mission reflects a collection focused organization.

2002	Current
Vision	**Vision**
The University Libraries is the center of choice at the University of Minnesota-Twin Cities for immediate access to high quality information.	The University Libraries are a strategic asset of the University, providing intellectual leadership and extraordinary information experiences toward the advancement of knowledge.
Mission	**Mission**
The mission of the Libraries is to enhance access to and maintain the record of human thought, knowledge, and culture for current and future users.	The University Libraries inspire learning and discovery through information resources, collaboration, and expertise.

Table 1. University of Minnesota Libraries Vision and Mission

The current vision and mission (adopted in 2004) reflect greater alignment with the institution's goals and focus strategic engagement. The phrase "extraordinary information experiences" underscores the library's role in enabling productive interactions with the information universe, *wherever* and *however* that interaction occurs. The new statements reflect a change in the library's relative position in the information universe.

4. The Library as Strategic Asset: Three Case Studies

To illustrate the notion of a changing paradigm for libraries, three case studies from the University of Minnesota Libraries will be shared. Each case offers different dimensions of the Libraries' transformed worldview and roles.

Assessment: Understanding Scholars' Behaviors and Processes

If the library is to be focused on supporting user processes, it must understand those processes. This becomes increasingly critical as those processes change in response to new content and capabilities in the network environment. The University Libraries embarked on a series of assessment efforts beginning in 2005 to better understand the changing behaviors and methodologies of the scholar community. These efforts focused on graduate students and faculty.

The first of these endeavors, a project entitled *A Multi-dimensional Framework for Academic Support,* was funded by the Andrew W. Mellon Foundation with an explicit goal to develop a model for understanding user behavior and to exploit the resulting data in order to bring

greater coherence to the distributed resources available to scholars. There was both a research component to document and analyze behaviors and also a development component to create a more productive research support environment that could be modeled, prototyped, and evaluated. While our goal in assessing behavior was both theoretical and practical, we also proposed to identify some common principles that could guide future development. This led us to develop a conceptual model to frame near- and longer-term activity.

The *Multi-dimensional Framework* program focused on humanities and social science disciplines. A similar, second study targeted the scientific disciplines including health sciences. The results of our these two studies have been well documented in project reports (University of Minnesota Libraries, 2006a and 2007) and recent research summaries (Palmer, 2009). Many of the findings were not unexpected. Researchers had a strong interest in digital resources from diverse media. They exhibited and desired ubiquitous and seamless access, reflecting the mobility and multiple contexts in which scholars work. Across all disciplines, there was a growing appetite for interdisciplinary and collaborative scholarship, yet all were challenged by obstacles of time and space that made collaboration difficult. A common and urgent concern was the challenge of organizing and managing personal research resources, whether personal collections of texts, images, real-time media, or data.

Several interesting findings also emerged. Humanists and social scientists highlighted that they often had unique resources to share with others, but lacked easy mechanisms to do so. Further, the inquiry methods that had been learned in traditional contexts were not easily transferred to the digital context. Scientists pointed to specific concerns about keeping up with a discipline's literature, mastering the vocabulary of related disciplines, and managing data.

A key strategy in our assessment was the development of an analytic framework. Using John Unsworth's notion of "primitives" (Unsworth, 2000), we categorized the behaviors represented in each stage of the research process. These primitives would help us identify common tasks and better understand the flow of scholarship, recognizing that each stage was not mutually exclusive and that the process was inherently iterative. Scholars' primitive behaviors were defined as *Discover* (identifying and securing relevant resources), *Gather* (managing research resources), *Create* (exploiting resources and other scholars in developing new scholarship), and *Share* (disseminating ideas and scholarship in diverse contexts).

The data also revealed where the pressure points were in the process, where scholars were challenged to migrate their existing methodologies to new digital contexts. We employed a graphic representation of the primitive research behaviors, selected common tasks, and ultimately all the data points from our assessment. The graphic (simplified below, see figure 1) was a critical tool in sharing and discussing the findings within the Libraries organization and also within the campus community.
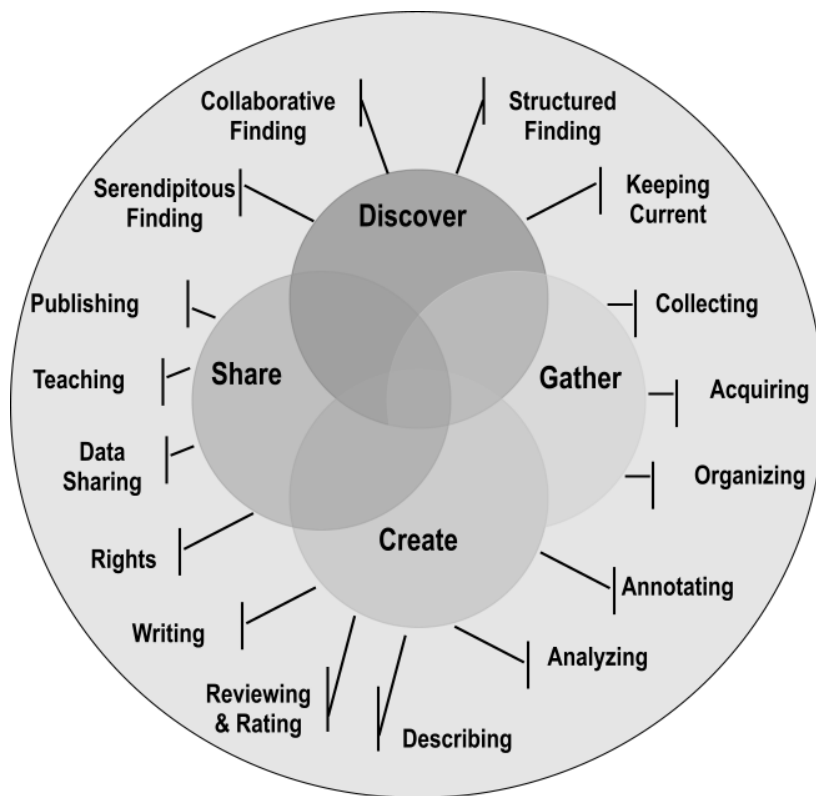
Figure 1. Primitive Behaviors and Common Tasks

Enabling Systems and Tools
One specific outcome from this assessment has been the development of more customized services that aid in the discovery and gathering phases of research. This effort builds upon earlier work to develop an Undergraduate Virtual Library (UGVL), which resulted in a component-based suite of services for this large campus audience. The UGVL site included, for example, a simplified "Google-like" search interface, tools for finding full-text resources, a blog service to enable dialogue, and a planning tool for course assignments. While the UGVL was highly successful, it did not offer customization at the discipline level, nor aid individuals in personalizing the service.

The data on research behaviors suggested a more granular customization would be necessary to meet the specialized needs of the research community. Using the University's institutional portal as a platform, the Libraries developed a *myLibrary* site within the portal that afforded the necessary flexibility for advanced scholarship. The *myLibrary* service brings together component content, services, and tools based on the needs of a particular community. Further it allows the user to personalize the service, adding favored resources and also enabling the user to export and incorporate *myLibrary* into other network services (e.g., iGoogle).

A critical element in customizing the delivery of *myLibrary* has been "affinity string" data, university-supplied code that captures information about an individual's role (undergraduate, graduate, faculty), college, department, and degree program affiliation. These affinity string data (described in Hanson *et al.,* 2008) are then matched with a set of resources based on the discipline's associated content and the likely service interests of the individual. So, for example, a graduate student in anthropology would see a suite of content and tools that includes: search tools, links to core anthropology resources, a full-text finder tool, links to the individual's library accounts, a citation management system (RefWorks), recent relevant program news from the Libraries, and a link to the appropriate librarian liaison.

The affinity string data also offer powerful information about community behavior that can be exploited in enhancing the system over time. The Libraries can capture information about how a particular group of users (e.g., anthropology graduate students) are interacting with the resources and how the boundaries of relevant resources are changing with their personalization. Those data can then be used to refine what resources are presented to the group over time. Similarly, it is possible to look at related disciplines and tap these behavioral data in the form of recommendations. While we have yet to leverage these data fully, there is great potential to make *myLibrary* a dynamic and responsive resource.

This case provides a wealth of interesting aspects of the new library paradigm. The *myLibrary* portal grows out of a deeper understanding of research processes and provides not just content, but tools to enable the scholar to be more productive and effective in their inquiry. The affinity data allow the environment to be customized and contextualized and to make sense of the wealth of resources available. Further, the portability of the *myLibrary* tools responds to the gravitational pull of Google and other popular network tools. Users can get relevant content pushed to them, while also pulling additional resources into their own information management environment.

Engagement: Intentional, Informed Community Exchange

The second case study will explore a new organizational model and also a process to engage the campus broadly in the areas related to the creation and sharing of scholarly resources, the arena captured in the phrase "scholarly communication." Here, too, the challenge is to better understand the current perspectives and behavior of the scholar community. A second challenge is to create the organizational infrastructure to engage effectively with the campus.

The University Libraries' structure includes the position of liaison librarians—i.e., individuals with subject domain expertise who are responsible for developing collections and supporting the instructional and research interests of particular academic disciplines. In 2005, a process improvement effort, called *Selection to Access*, was launched with a goal of freeing up time of liaisons as well as improving the timely and efficient workflow of processing collection resources. The process expanded approval plan programs and harnessed vendor systems for

more efficient referral of titles to liaisons. Ultimately, the initiative resulted in the majority of English language monographs received shelf-ready and with little involvement of liaison librarians or processing staff. This program enabled liaison librarians to re-focus their time and energies to more complex collection development and management and greater outreach to the campus. It set the stage for engagement on critical issues.

The Scholarly Communication Collaborative was created to address critical issues related to the dissemination of scholarly work. Drawing librarians from across the Libraries system, it brought together a dedicated team with the expressed purpose of coordinating a program agenda that embraced issues of both policy and practice. The charge to the Collaborative set the context in which the group would work:

> Scholarly communication first entered our professional consciousness in the 1990s, centered on the topic of rising serials prices and their impact on libraries' budgets. Our lexicon was one of problems, crises, and the clear definition of an enemy. Several years experience working in this arena has led to a more informed, broader perspective - part of a natural evolutionary process. Formerly we focused almost exclusively on the economic case, with some real successes. A number of faculty and administrators did become outraged and engaged. But many also told us the system works just fine for them; publishers told regulators that the real problem is under funding of universities. To achieve a marked, sustained impact on scholarly communication, librarians need to be advocates for faculty and administrative action. Scholars must be the new face of this effort and focus on how the present system restricts access to their scholarship. In other words, this is no longer just a library problem of serials inflation (with a spillover effect of reduced monograph purchases), but a series of scholarly communication issues and opportunities owned by scholars, their campuses and their societies.
>
> *(University of Minnesota Libraries, 2006b)*

The focus for the Collaborative encompassed a series of issues associated with copyright, technologies, licensing, and sustainable models for publishing. In order to engage the community, significant investment was necessary to build a knowledgeable staff, to equip librarian liaisons with tools for outreach, and to better understand the current behaviors and stakeholders within the community.

The processes used by the Scholarly Communications Collaborative are now documented by an Association of Research Libraries resource site (Fowler *et al*., 2009). The program structure began by assessing skills and developing knowledge among staff. This was accomplished through invited speakers and a set of tools for outreach (e.g., PowerPoint presentations, handouts). In addition, resources were developed for the campus, including a web-based, self-playing tutorial on authors' rights issues. A third key element has included a comprehensive environmental scan wherein key campus advocates were identified, and data captured about open access publishing venues and activity within each discipline.

The Collaborative has provided a core team to develop the agenda and facilitate the work of librarian liaisons within their relevant disciplines. The educational and outreach processes have been foundational in building campus awareness and interest in action. These steps are essential, but not sufficient. Services and technology infrastructure provide other key components of the program. A campus website (http://www.lib.umn.edu/scholcom/) provides topical analyses of issues, presents perspectives of advocates on campus, and is a source of constantly updated news about relevant developments within the academy. A Copyright and Publishing Resource Center (http://www.lib.umn.edu/copyright/) provides expert consultation services and education programs, as well as web-based tutorials and information. The Libraries' University Digital Conservancy (http://conservancy.umn.edu/) provides a digital repository for the works of campus units and individual authors, enabling open access deposit. Liaisons engage in active content recruitment for the Conservancy from individual faculty and departments.

The Scholarly Communications Collaborative offers another example of an engaged library. As noted in the group's charge, these issues are "owned by scholars" and our strategy of engagement has to work from an informed vantage point within the community. Services and educational programs support scholars as they explore the issues or seek practical counsel. And, finally, infrastructure enables scholars to take action (e.g., in selecting a publisher or in depositing content in an open repository).

Catalyst: Shaping a Sustainable Virtual Community

The third and final case explores the library's potential role supporting virtual communities of scholars. The robust capabilities for communicating and sharing via the network, coupled with increasingly rich repositories of content and associated tools, create a context where groups can coalesce and collaborate. In the past decade, there have been a growing number of examples of these online contexts, sometimes called collaboratories or grid communities, and also increasing interest in the psychological and sociological dimensions of these venues for e-research.

One of National Science Foundations' priority areas for investment is in the development of these virtual communities or organizations. A recent report, *Beyond Being There* (NSF, 2008), pursues the symbiotic relationship between technologies and the associated community or organization. On the one hand, these virtual organizations are built upon essential collaboration technologies. Yet the needs of the community also shape the technology. The culture of the community also plays an important role in determining how the online environment takes shape. How willing is the community to share resources? How do issues of status and affiliation affect participation? What motivates individuals to participate and contribute actively?

Virtual communities offer great promise for the advancement of research, particularly as global scholarship becomes more of a reality. Yet there are significant challenges in effectively

harnessing technology, relevant resources, and community interests to ensure a sustainable organization. As the NSF report notes:

> The time is right for taking a more cross-cutting, multidisciplinary approach to understanding the basic organizational abstracts, communication models, trust mechanisms, and technology infrastructure required to form and operate effective VO's [virtual organizations] across a broad range of target domains.
>
> *(NSF, 2008, p.1)*

In 2006, the EthicShare project was launched to address the community needs of the field of practical ethics. The pilot phase of EthicShare focuses on bioethics. Funded by the Andrew W. Mellon Foundation, the project is a collaboration between three organizations at the University of Minnesota: the Center for Bioethics, the University Libraries, and the Department of Computer Science and Engineering. The project aims to deliver a customized information discovery and access environment, integrated with tools and services that support the practices of and engagement among ethics scholars. Our hope, too, is that the endeavor will create an extensible community platform that can scale from bioethics to other areas of practical ethics, and also develop a model that might be deployed in other discipline domains.

Bioethics is a relatively young field that explores issues in human values as they relate to health services, the education of healthcare professionals, and research. It is a discipline that draws on diverse content encompassing the literatures of medicine, public health, religion, philosophy, public policy, political science, economics, and law. In addition to traditional book and journal publications, it also relies on government publications and commission reports as well as popular media. Given the breadth of disciplines, the relevant vocabularies are equally diverse.

In developing EthicShare, early assessment of the community was essential. Surveys and focus groups, with participants drawn from many institutions, identified the community's desire for the project to: aggregate content, ensure reliable access to full-text, provide collaboration tools, and create a venue for both group and personal work. To the extent to which EthicShare needed to be a valued destination for ethicists, it also had to bring together relevant news feeds, grants, and events information. The project has identified four critical areas that are essential to developing the EthicShare environment:

- Collection development: tools to harvest and represent content from multiple relevant disciplines, in multiple formats.
- Discovery: systems to enable domain-sensitive search, services to allow community description (tagging), and the ability to exploit the community's behavior (e.g., in creating recommender services).
- Engagement and collaboration: social tools to allow a global community to add value to the services and to stimulate dialogue among scholars.

- Policy and sustainability: policies that govern community behavior, mechanisms that motivate participation, and an economic model to sustain the service over time.

As implemented, EthicShare has drawn on an open framework with modules to harvest content from the network and relevant content providers, resolve user searches from citations to appropriate full text, provide faceted search, and review and tagging functionality. Group engagement is facilitated with special interest groups. A related research program will explore techniques and tools to facilitate and motivate contributions from community members –e.g., contributions of content, reviews, descriptive tags, event information, etc.

The project also explores issues of governance. Myriad policy issues will be addressed, including questions associated with scope and quality assurance of the content, monitoring contributions, the research agenda, privacy, and intellectual property. Ultimately, an economic model for sustaining the services will also need to be developed.

Library role in Virtual Communities?

What role should libraries play in these virtual community environments? Libraries bring obvious expertise in selecting and managing content and repositories. We have a record of designing discovery systems. Libraries also have experience related to tool development and integration of resources. Where libraries have been less involved is in the behavioral and community assessment that is a necessary prerequisite to developing customized environments. Further, the library's role in catalyzing collaboration is infrequent or unintentional. One could argue that bringing together the right content and tools may be sufficient to prompt a community to engage, but experience and research have chronicled problems of low adoption of new services and of modest engagement in online contexts. In order to play a key role in designing and shaping virtual communities, the library will need to be far more intentional in motivating adoption and more active in collaborating with target communities in the design and execution of the services.

A prevailing question in our work with virtual communities is whether "social tools will play in the serious spaces of the academy?" We have ample evidence of the success of social networking sites such as Facebook or MySpace for a general audience, but it is less clear if aspects of this functionality will work for scholarly exchange. Some preliminary assessment within EthicShare, for example, suggested scholars assumed staff should handle tasks such as adding, describing, and managing content. Faculty also expressed reticence to comment on or evaluate resources. There is some anecdotal evidence this may be generational, with graduate student participants expressing more desire to engage online.

In my earlier remarks about shifts within the library profession, I noted the challenge of serving global audiences. Libraries are typically structured and funded to serve a local clientele. Our licenses, for example, are usually restricted to the institutional community. Virtual communities challenge those traditional structures. While EthicShare addresses some of the issues (for example, resolving users to the right copy of licensed content), there are countless other issues to address with respect to serving and supporting the community. Will other libraries assist in identifying relevant content? Answering user inquiries? Or does EthicShare become a third-party service, much like a publisher or vendor site, with libraries simply facilitating access for local scholars?

The underlying economic model is a pressing issue, but the longer term question of configuring institutional commitments for virtual communities looms large. Can we imagine a global structure with individual institutions or consortia hosting particular instances of virtual communities? The challenges of transforming a locally focused infrastructure to one that contributes to a global network of services will require significant shifts in commitments at the scholar, library, and institutional levels.

5. Emergent Roles: From Copernicus to Friedman

The paradigm shift represented in the new roles for libraries will require different talents and a different perspective within our profession. Copernicus advanced a new worldview in the 16th century; more recently Thomas Friedman has advanced a more contemporary worldview in *The World is Flat* (Friedman, 2007). His exploration of the effects of technology and globalization includes an interesting description of the desired attributes of the new workforce. The flat world will require "Versatilists" who can "apply depth of skill to a progressively widening scope of situations and experiences, gaining new competencies, building relationships, and assuming new roles." He notes that these individuals "are capable not only of constantly adapting but also of constantly learning and growing." (Friedman, 2007, p. 294). Clearly, the world of research libraries will require this facility, this ability to constantly adapt as scholarship changes and as new technologies are added to our repertoire.

Friedman also describes other desired capacities that are equally relevant to the future of libraries. Skills in collaboration and mobilizing others will be valued. He argues that, in the flat world, there will be a premium for those with the ability to identify solutions that strategically synthesize resources and the ability to bring simplicity to complex situations. Understanding processes and leveraging resources will be key. And finally, we will be challenged to adapt a global infrastructure to local or disciplinary needs. The advantage of these new strategic roles – collaborators, synthesizers, explainers, leveragers, localizers – is clear for the diffuse library.

6. Changing the Paradigm

While these remarks are focused on a single institution's experience as case study, the underlying message applies broadly to the library community. In the three cases explored here, each presents evidence of new roles that move beyond the traditional realm of developing, making accessible, and mediating collections. In each instance we see the importance of essential expertise that enables collaboration, engages the scholar community, and leverages resources of the library and the community it serves. We also see obvious shifts in resources that are necessary for these new directions. These shifts in investments are critical in advancing a new paradigm, aligning the library assets with priorities within the academy. As Kuhn notes:

> …the extraordinary episodes in which that shift of professional commitments occurs are … revolutions. They are the tradition-shattering complements to the tradition-bound activity of normal science.
>
> (Kuhn, 1962, p. 6)

Let me close with a few questions. Have we reached a point where we have a new focus for our organizations, a shared worldview? Are the library's areas of focus sufficiently aligned with what we know about the directions and aspirations of the academy, our institutions, or particular communities? Do we truly understand the needs and processes of our constituent user communities (and who, exactly, are those users)? Do we have the right talent in place to manage a future with constant change? And have we experienced tradition-shattering changes in resource commitments?

Is the diffuse library a reality?

References

Dempsey, L. (2007), "Lorcan Dempsey's Weblog", 16 September, available at: http://orweblog.oclc.org/archives/001430.html (accessed 5 April 2009).

Fowler, K., Persily, G. and Stemper, J. (2009), "Developing a Scholarly Communication Program in Your Library", Association of Research Libraries, Washington, DC, available at: http://www.arl.org/sc/institute/fair/scprog/index.shtml (accessed 5 April 2009).

Friedman, T. (2007), *The World is Flat*, Picador/Farrar, Straus and Giroux, New York, NY.

Hanson, C., Nackerud, S. and Jensen, K. (2008), "Affinity strings: enterprise data for resource recommendations", *Code{4}Lib Journal*, Issue 5, 2008-12-15, available at: http://journal.code4lib.org/articles/501 (accessed 5 April 2009).

Kuhn, T. S. (1962), *The Structure of Scientific Revolutions,* The University of Chicago Press, Chicago, IL.

Lougee, W.P. (2002*), "*Diffuse Libraries: Emergent Roles for the Research Library in the Digital Age"**,** Council on Library and Information Resources, Washington, DC, available at: http://www.clir.org/pubs/reports/pub108/pub108.pdf (accessed 5 April 2009).

National Science Foundation (2008), "Beyond Being There: A Blueprint for Advancing the Design, Development, and Evaluation of Virtual Organizations"*,* National Science Foundation, Washington, DC, available at: http://www.ci.uchicago.edu/events/VirtOrg2008/VO_report.pdf (accessed 5 April 2009).

Oxford English Dictionary (OED) Online (2009)*,* Oxford University Press, Oxford, available at: http://www.oed.com/ (accessed 11 April 2009).

Palmer, C.L., Teffeau, L.C. and Pirmann, C.M. (2009), "Scholarly Information Practices in the Online Environment: Themes from the Literature and Implications for Library Service Development", OCLC Online Computer Library Center, Dublin, OH, available at: www.oclc.org/programs/publications/reports/2009-02.pdf (accessed 5 April 2009).

Smith, A. (2008), "The research library in the 21st century: collecting, preserving, and making accessible resources for scholarship", in *No Brief Candle: Reconceiving Research Libraries for the 21st Century*, Council on Library and Information Resources, Washington DC, pp. 13-20, available at: http://www.clir.org/pubs/reports/pub142/pub142.pdf (accessed 5 April 2009).

Surowiecki, J. (2004), *The Wisdom of Crowds*, Random House, New York, NY.

University of Minnesota Libraries (2006a), "A Multi-Dimensional Framework for Academic Support: A Final Report", Minneapolis, MN, available at: http://www.lib.umn.edu/about/mellon/UMN_Multi-dimensional_Framework_Final_Report.pdf and http://www.lib.umn.edu/about/mellon/UMN_Multi-dimensional_Framework_Final_Report_Appendices.pdf (accessed 5 April 2009).

University of Minnesota Libraries (2006b), "Scholarly Communication Collaborative Charge", Minneapolis, MN, available at:

https://wiki.lib.umn.edu/ScholarlyCommunicationCollaborative/Charge (accessed 5 April 2009).

University of Minnesota Libraries (2007), "Understanding Research Behaviors, Information Resources, and Service Needs of Scientists and Graduate Students", Minneapolis, MN, available at: http://www.lib.umn.edu/about/scieval/Sci%20Report%20Final.pdf (accessed 5 April 2009).

Unsworth, J. (2000), "Scholarly primitives: What methods do humanities researchers have in common, and how might our tools reflect this?", paper presented at Symposium on Humanities Computing: Formal Methods, Experimental Practice, 13 May, King's College, London, available at:
http://jefferson.village.virginia.edu/~jmu2m/Kings.5-00/primitives.html (accessed 5 April 2009).

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