The Role of Research Libraries in Conceptualizing and Fostering Scholarly Commons

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Introduction

For centuries, libraries have served as information commons throughout the world. They offer their communities free and open access to information that promotes the sharing and advancement of knowledge and understanding. They encourage participation and deliberation. And they provide a safe public space where people encounter differing opinions on controversial questions. In the digital age, libraries utilize new technologies to extend their reach in order to promote economic well being, global understanding, learning and research, information literacy, equitable access, and public participation in democracy.

New technologies have provided expanded opportunities for scholars to create, distribute, and preserve their own knowledge. Through the development of digital libraries, digital repositories, open access and archives initiatives, and collaborative teaching and learning centers, librarians are working closely with scholars to harness the power and potential of technology to democratize access to and production of scholarship. By undertaking these activities, they are envisioning as well as building new paradigms for creating and managing in the information age. These emerging digital

information sharing initiatives, or *scholarly commons*, allow universities to reclaim their intellectual assets and fulfill critical roles in the digital age--the advancement of knowledge, innovation, and creativity through democratic participation in the free and open exchange of ideas.

In this paper, I outline the progress toward utilizing new technologies and suggest strategies for helping universities and their research libraries reap the benefits of adopting these new models of access and participation over the coming years. I also discuss the challenges to achieving these new operational modes. In addition, I propose some designs for governance structures, financial models, partnerships, education and advocacy efforts that will help transform the academy into a 21st century institution that organizes, safeguards, preserves and promotes the knowledge assets of the scholarly community. Finally, I suggest research that is needed to advance theory and practice and suggest policy actions to support the growth and development of a sustainable information commons.

Challenges to the Progress of the Scholarly Commons

For scholarship to flourish, researchers need free and open access to ideas. In today's digital age, this means access to knowledge and information online. In the early days of the Internet, new technologies promised exactly that – abundant open access to an infinite array of resources available anywhere, anytime. Adoption of new technologies has transformed the way students learn, faculty teach, and libraries deliver research resources. But the same technology that enables unfettered access can also restrict information choices and the free flow of ideas.

In the 1980s, many scholarly societies turned over their journal publishing to private firms as a way to contain membership fees and generate income. The short-term financial gains, however, were offset by serious losses in terms of access to research results once journal prices outpaced library budgets. Prices of scholarly journals soared, and publishing conglomerates restricted access through expensive licenses that often require bundled or aggregated purchase of titles.

Mergers of publishers of academic journals left a few international conglomerates in control, straining already tight higher education budgets by charging up to $20,000 for subscriptions to journals like *Nuclear Physics, Brain Research*, and *Tetrahedron Letters*, while returning profits as high as 40%.[1] This system essentially compels universities to finance research, give it away to publishers for free, then buy it back at astronomical prices.

Because of the extraordinary increases in journal costs -- 220% since 1986 (as compared to an increase in the consumer price index of 64%),[2] research libraries have had no recourse but to cut many of their journal subscriptions. At the same time, the stress on budgets has resulted in far fewer purchases of books, causing strain on university presses that traditionally relied on libraries for 80% of sales. (By the end of the 20th century, this was down to 40%.)[3] Shorter press runs meant more scrutiny of viable offerings; as a result, fewer titles were published, impacting young humanities scholars who could no longer rely on university presses to publish their research.[4]

In addition to steep price increases for some publications, publishers and information aggregators are requiring consumers and libraries to sign restrictive licensing agreements if they are to acquire or use digital materials – both copyrighted and public

domain – that are compiled into databases such as LEXIS/NEXIS. Some licenses are simply imposed on consumers when they open shrink-wrapped packages or download software from the Internet. Others signed by libraries require complex negotiations prior to electronic purchases, and often force libraries to buy bundled suites of items -- many of low interest -- if they are to receive titles in greater demand. In addition, these contracts centralize control over the flow of information and eliminate many user protections guaranteed under copyright laws, such as fair-use rights to view, reproduce, and quote limited amounts of copyrighted materials.[5]

The academic community has confronted this crisis by seeking ways to reclaim control of its research and scholarship. No longer able to afford costly journals and licensing arrangements, librarians have joined forces with scholars, academic administrators, computer and information scientists, nonprofit publishers, and professional societies to create more competition in, and alternative modes of, scholarly publishing. Though it may not define its efforts as a unified movement, the scholarly community has thus succeeded in launching well-managed, self-governed research commons that allow them to take back their information assets while promising sustainability and an alternative to the restrictive private-sector market.[6]

At the same time that libraries and scholars are pressed to sustain the production and preservation of knowledge, they are facing the imposition of new "technological protection measures" such as "digital rights management" techniques that prevent individuals from lawful lending and sharing of creative works, or making "fair use" of them through commentary, parody, scholarship, or news reports. Congress has exacerbated this problem by passing such laws as the 1998 Digital Millennium Copyright

Act (the "DMCA") which imposes criminal penalties for circumventing encryption and other technological protection measures, or even distributing circumvention tools,[7] and the Sonny Bono Copyright Term Extension Act (the "CTEA"), which extends the already lengthy duration of copyright for 20 years, thereby freezing the public domain where works are freely available to distribute, copy, and share.[8]

Recently, the courts have reinforced these Congressional actions that further enclose the public domain and limit the public's rights to use information. In Eldred v. Ashcroft in 2003, the Supreme Court rejected a constitutional challenge to the Sonny Bono law, in a decision that seems to give Congress the power to extend the copyright term at will into the future.[9] In 2000, the lower courts shut down the music file-sharing service Napster. Less centralized systems like Grokster and KaZaA took Napster's place, but they too have been sued for "contributory" copyright infringement. In 2003, the recording industry filed suits against hundreds of people whom it accused of downloading copyright-protected music. The continuing efforts of the companies that make up the "copyright industry" to shut down file-sharing services, prosecute individuals for alleged copyright violations, and otherwise lock up information have resulted in a highly-contested policy terrain for information and culture.[10]

In the face of these developments, librarians and scholars have struggled to protect access to critical research resources, balance the rights of users and creators, and preserve the public domain in the digital age. Although they have mounted an impressive effort to stop the enclosure of information, they face an uphill battle to influence outcomes.

Now, however, these communities are coming together around the emerging concept of the information commons, which offers a new model for sharing information, stimulating innovation, fostering creativity, and building a movement that envisions information as commons available to each member of a community. A commons, which may be either a public good *or common pool resource,* simply understood, is a resource or facility "that is shared by a community of producers or consumers."[11] Some examples of public goods are stores of knowledge, national defense, protection of the atmosphere, while examples of common-pool resources include fisheries, grazing areas, bridges, and mainframe computers. What distinguishes all of these resources is the difficulty or feasibility of excluding beneficiaries (*exclusion).* They differ in regard to the degree to which one person's use of the resource diminishes what is left for others (*subtractability).*[12]

History and Theories of the Commons

Debates about the legal, economic, and political status of common property have ensued at least as far back as the enclosure of manorial fields in Europe during medieval times.[13] But Garrett Hardin's publication of his 1968 article, "The Tragedy of the Commons," which used the example of overgrazing to argue that unlimited use of resources results in excessive demand and, consequently, in overexploitation, fueled this debate.[14] Since that time, scholars from several disciplines have countered Hardin's conclusions with their own studies of common property resources where group control over resources does not lead to overuse, but to the balancing of benefits and costs.[15]

Following the publication of Hardin's article, other scholars such as Siegfried Ciriacy-Wantrup and Richard Bishop have distinguished between two types of legal regimes that govern commons: *open-access* (or no property regimes) and *common property regimes.* With open access, nobody has the legal right to exclude anyone else from using the resource, but the tragedy of the commons may ensue because of overuse or destruction. In contrast, common property regimes provide members of a clearly defined group with a bundle of legal rights, including the right to exclude nonmembers from using the resource.[16]

Common-pool resources differ in several ways from "public goods." Like common pool resources, public goods cannot exclude beneficiaries easily. But many of these non-rivalrous resources require public investment to make them accessible and usable – for example, public transportation, or police and fire protection.[17] In contrast, common pool resources that are regulated by a common property regime are managed based on intensity of use and delineation of eligible users.[18] Since the late 1960s, economists have debated the emergence, efficiency, and stability of common property.[19] One economist, Carl Dahlman, concluded:

> General economic theory does not imply the universal inefficiency of communal ownership and collective control. On the contrary, correctly applied economic theory will predict that, under certain conditions with respect to transactions and decisions costs, such arrangements will be superior to private ownership and individual control.[20]

Another economist, Glenn Stevenson, has identified seven useful characteristics that distinguish common goods from public and private goods.[21]

A number of other social scientists and legal scholars have also examined how common property resources work. Political scientist Elinor Ostrom has analyzed the

characteristics of resources held in common, and concludes that the common property regimes that regulate these resources (more or less successfully) are distinguished by group, rather than individual, control; the group is then responsible for balancing benefits and costs, defining who may participate in resource use and to what degree, and designating who will make management decisions.[22] Ostrom and her colleague Edella Schlager underscore that it is "the difference between exercising a right and participating in the definition of future rights to be exercised…[that] makes collective-choice rights so powerful."[23]

Ostrom's 1990 seminal work, *Governing the Commons,* provides a systematic blueprint for analyzing and understanding the economic and experimental foundations for common property resources. By studying a variety of common-pool resources in order to respond to Hardin's "tragedy," Ostrom has laid out a framework for assessing commons, plus eight design principles that enable people to use these resources over a long period of time. Included in the framework are conditions necessary for self-governance: clearly defined boundaries, the design and enforcement of rules, the extension of reciprocity (the equal exchange of goods and knowledge), building trust and social capital, and communication channels.[24] Thanks to Ostrom and others, groups interested in developing and managing common property now have a useful framework for understanding how to do it.

More recently, Ostrom has applied her theories to understanding information as a common property resource. Together with her colleague Charlotte Hess, Ostrom has described the complex tangible and intangible attributes of information, particularly in digital form, with its fuzzy boundaries, diverse community of users on local, regional,

national, and international levels, and multiple layers of rule-making institutions. They parse scholarly information resources into three distinct forms: ideas, artifacts, and facilities.[25] Their work offers useful tools for assessing emerging models for creating and delivering information resources that are both manageable and sustainable.

New initiatives with characteristics of common pool resources are under development. They share features such as open and free access for designated communities, self-governance, collaboration, free or low cost, and sustainability, with rules and norms defined by their communities. Some of these projects use the Internet itself as a commons, employing open source software, peer-to-peer file sharing, and collaborative Web sites, while others are more focused on content creation and dissemination. While some consider the whole Internet or the public domain[26] a type of commons, these are essentially open access and lack the clearly defined group governance that is characteristic of "common-property regimes." Thus, while not every example fully embodies all aspects of commons, they all represent exciting new approaches to populating the marketplace of ideas.

Digital Libraries

Over the past two decades, librarians have transcended the boundaries of their buildings by delivering resources and services remotely. To assist scholars, they have expanded access to materials by digitizing collections, purchasing and linking to electronic resources, creating digital repositories, establishing standards and best practices for describing and preserving materials, and teaching the skills users need to utilize these new tools. They have also advocated for more open, affordable access to

resources with both publishers and policymakers. Today, faculty and students can use research materials anytime and anyplace, and they can receive expert assistance with the click of a mouse. Indeed, librarians have helped transform the academy into a 21st century digital enterprise.

Librarians began digitizing collections more than a decade ago, working locally and collaboratively to develop the tools for presenting collections online. Greenstein and Thorin describe the evolution of these activities, explaining that much of the early work was grant-funded and experimental, focusing on the development of best practices and standards, as well as on demonstrations that showcase particular collections and services online. Towards the end of the 1990's, these efforts began focusing on users and their preferences and needs. Today, individual institutions have sought partnerships to participate in more collaborative development of digital collections, to create closer ties to the communities most interested in these collections, and to integrate these programs into mainstream library services.[27]

Recently, a collaborative digital library effort, the Distributed Open Digital Library (DODL) was launched to provide universal electronic access to public domain humanities and social science collections from multiple research institutions for use by scholars, teachers, students, and the public.[28] A similar effort in the United Kingdom will extend beyond universities to include some 20 public sector and other organizations that will form a Common Information Environment Group to serve the information needs of a wider audience of learners.[29] Another effort is the Digital Promise Project, an American initiative to create the Digital Opportunity Investment Trust ("DO IT") that would

encourage public and private sector partnerships to digitize materials in education, science, the humanities, the arts, and civic affairs.[30]

Digital Repositories

Research libraries have also taken a leadership role in the archiving of digital resources. In October 1999, the library community helped launch the Open Archives Initiative (OAI) to utilize new technologies, along with standardized descriptive cataloging (or metadata), in order to provide low-barrier, free access to archives of digital materials. OAI develops and promotes interoperability standards that facilitate the efficient dissemination of scholarly papers.[31] Using the OAI tool, a number of universities, disciplines, and individuals now share scholarship, take a more active, collaborative role in modernizing scholarly publishing, and provide an unprecedented alternative to the limited access dictated by ever-more restrictive copyright legislation, licensing agreements, and technological protection measures.[32]

Best known of the new institutional digital repositories is MIT Library's *DSpace*, launched in November 2002 as an open source software platform that enables the capture and description of digital works, distribution over the Web through a search and retrieval system, and preservation over the long term. Aimed at making MIT faculty members' scholarship widely available, this project has encouraged the development of similar systems that provide access to the collective intellectual resources of the world's leading research institutions, like Érudit at the University of Montreal, eScholarship, sponsored by the University of California's Digital Library, and the Digital Academic Repository of the University of Amsterdam (UvA-DARE).[33] According to Clifford Lynch, executive

director of the Coalition for Networked Information, this development emerged "as a new strategy that allows universities to apply serious, systematic leverage to accelerate changes taking place in scholarship and scholarly communication." It moves universities "beyond their historic relatively passive role of supporting established publishers," and enables them to explore "more transformative new uses of the digital medium."[34]

Like universities, academic disciplines have also created a rich array of repositories. The first, the Los Alamos ArXiv.org, begun in 1991 by physicist Paul Ginsparg, provides low-cost access to scientific research in physics and related fields before peer- review and subsequent publication in journals. This open access, electronic archive and distribution server, now maintained by the Cornell University Libraries, receives as many as 120,000 queries per day, and includes more than 250,000 papers.[35] In 2004, papers located on the ArXiv.org e-print service are cited about twice as often as astrophysics papers that are not, according to a report presented at the American Astronomical Society (AAS) Publications Board in November 2003.[36] Following the success of ArXiv.org, numerous other discipline repositories have been created, including EconWPA, the Oxford Text Archive, the PhilSci Archive; the Networked Digital Library of Theses and Dissertations, and the Digital Library of the Commons.[37]

Individual authors are also distributing their own scholarly information through personal Web sites or independent repositories. By retaining rights to archival copies of their publications, scholars become part of an international information community that increases access and benefits for everyone. According to Stevan Harnad and other researchers at the RoMEO project at the University of Loughborough in England, 55% of journals now officially authorize self-archiving, and many others will permit it upon

request, demonstrating the dedication of many scholarly publications to promoting rather than blocking research impact. The more that research is read, used, cited, and applied, the greater the impact. As with many forms of information, rewards are reaped from increased reading and use, not from sales.[38]

Open Access to Scholarly Journals

With the support of research libraries, both the European and American academic communities have created new and exciting institutions to manage and disseminate scholarly information. Foremost among them is the Scholarly Publishing and Academic Resources Coalition (SPARC), founded in 1998 as an alliance of universities, research libraries, and organizations. SPARC now has 300 member institutions in North America, Europe, Asia, and Australia. Built as a constructive response to market dysfunctions in the scholarly communication system, SPARC helps incubate alternatives to high-priced journals and digital aggregated databases, publicize key issues and initiatives, and raise awareness among the scholarly community about new publishing possibilities.[39]

Beyond projects undertaken by SPARC, many professional societies in the U.S. are adopting their own new paradigms for sharing research results. For example, the American Anthropological Association offers its members free online access to a vast array of resources in anthropology. Similarly, the American Physical Society permits its authors to post articles to digital repositories.[40]

A significant development in journal publishing is open access, which allows widespread use of scholarly information online. For the sake of accelerating research and sharing knowledge, open access publishing initiatives are searching for ways to recoup

their costs from sources other than subscriptions. Among the more than 700 open-access journals now distributed are titles as diverse as *Cell Biology Education, Journal of Arabic and Islamic Studies,* and *The New England Journal of Political Science.*[41] Peter Suber, publisher of Open Access SPARC's *Open Access Newsletter,* contends that adopting new standards and structures will not only reduce costs, but also overcome barriers to access such as restrictive copyright laws, licenses, and DRM.[42] To encourage open access, the Soros Foundation's Open Society Institute created the Budapest Open Access Initiative, which provides leadership, software, technical standards, and funding.[43] For scholars, free availability over the Internet has dramatically increased their frequency of citation, ensuring greater impact and faster scientific progress, particularly beyond the borders of North America and Europe.[44]

A number of new, online open access journals have begun publication, funded by foundations, learned societies, and other nonprofits, with assistance from SPARC and the Open Society Institute. Because the crisis in scholarly publishing hit science early and hard, the scientific community has led the way in designing new modes to exchange research and data. In 1999, BioMed Central became the first scientific publisher to institute an alternative model that offers open access online journals that are fully peer-reviewed. It recovers costs through author charges, some advertising, and institutional support from universities and foundations.[45] Three years after the introduction of BioMed Central, the Public Library of Science (PLoS), conceived by Nobel Laureate Harold Varmus with his colleagues Michael Eisen and Pat Brown, and funded by a $9 million grant from the Gordon and Betty Moore Foundation, was founded as a nonprofit scientific publishing initiative. Its first open access journal, *PLoS BIOLOGY*, launched in

October 2003, was so popular that it received more than 500,000 hits in a matter of hours, bringing the server down temporarily.[46] Another scientific open access initiative is BioOne, an innovative partnership between scientific societies, academe, and the commercial sector that receives support from close to 900 libraries.[47]

Opportunities and Challenges

No doubt, these new scholarly communications paradigms are transforming the roles of scholars as well as librarians in advancing teaching, learning and research in the digital age. As scholars reclaim control over their intellectual assets, Hess and Ostrom have described their role as changing "from passive *appropriator* of information to active *provider* of information by contributing directly into the common pool." They point out that scholars worldwide are "not only sustaining the resource (the intellectual public domain) but also building equity of information access and provision, and creating more efficient methods of dissemination through informal, shared protocols, standards, and rules."[48]

Joining forces with librarians are scholars eager to design new paradigms for creating and disseminating scholarly communication. As a result, novel collaborative efforts among communities with common interests are emerging. These efforts embody many of the characteristics of common property resources or commons. They take advantage of the networked environment to build real and virtual information communities, and they benefit from network externalities, meaning the greater the participation, the more valuable the resource. Cost to these communities is often free or low, ensuring equitable, democratic participation and encouraging interactive discourse and exchange among members. Participants contribute new creations after they gain and

benefit from access. Such reciprocity enhances both the human and social capital of these sustainable common goods. Their governance is shared, with rules and norms defined and accepted by constituents.

According to Peter Levine, what is appealing about such efforts is that they are not controlled by bureaucrats, experts, or profit-seeking companies and they encourage more diverse uses and participation. At the same time, however, they are vulnerable if they fail to adopt appropriate governance structures, rules, and management techniques in order to defend themselves against rival alternatives, influence democratic discourse, and avoid the anarchy that can result in the tragedy of the commons as described by Hardin.[49] That is one of the many reasons why the sponsorship and collaboration of institutions like universities and libraries remain so vital to protecting, promoting, sustaining and preserving newly emerging information commons. In fact, research libraries provide just the type of sponsorship and collaboration needed by scholarly commons if they are to thrive in a complex and competitive information marketplace.

The Role of Research Libraries

New methods for creating and disseminating scholarly information provide extraordinary opportunities to transform research libraries into 21st century institutions for collective action. Actually, this transition began as far back as the mid 20th century. Clifford Lynch has cogently summarized the four stages of this transition, beginning in the 1950s with the automation of day-to-day library operations, followed by reference use of computerized databases in the late 1970s, then direct patron access to the Internet in the 1990's, and finally purchase of commercial databases and digitization of collections

to digital formats.[50] By automating and then networking their operations, librarians built bridges that connected collections and reference services directly to faculty and students needing context, connectivity, content, and capability to navigate the bewildering sea of information flooding their desktops. As a result, libraries are now available to anyone, anytime, anywhere, although many of their collections are restricted for use by specified communities.

Recently, research libraries began transcending from automated information providers to digital information collaborators. Today, many librarians are expanding their information organizational role into knowledge management and electronic publishing, greatly increasing the availability of resources for teaching and research. They partner with faculty to deliver information and instruction directly into the classroom. They are designing instructional programs and teaching students how to find information, whatever its format or location, and how to evaluate what they find. In addition, they serve as consultants on information resources, issues, and problems and developing and implementing information policies for their institutions. And finally, they lead and facilitate the introduction of new technological tools that enhance teaching and research, while ensuring their effective use.

Rather than simply supporting the work of the academy, librarians are now becoming partners in a common enterprise that relies on their leadership and vision. 21st century librarians are (1) working together with information/learning communities to enhance the production, availability, and preservation of knowledge; (2) collaborating beyond their facilities to create active, resource-based learning models that encourage critical thinking; and (3) fostering the creation of information communities, both within and outside the library.[51] By collaborating with colleagues throughout the university,

research libraries foster not just access, but also the creation, exchange, and preservation of ideas among diffuse communities of scholars. Through this transition, libraries are evolving into "institutions of collective action," or commons, in order to ensure the long-term, productive use of scholarly assets.[52]

In her report, *Diffuse Libraries,* Wendy Pratt Lougee describes how new technologies have helped change the role of research libraries in the digital age. As digital efforts have evolved from projects to programs, research libraries have become less hierarchical, relinquishing control to more democratic modes of governance and participation. Lougee observes that the relationship between libraries, content creators, publishers, and consumers is changing as information becomes more distributed and access more open. She sees in these trends "a shift from publication as product to publication as process."[53] As information distribution becomes more diffused, libraries become more involved in the process of scholarly communication and in building information communities. This transformation into more engaged, collaborative institutions will transform libraries as creators and not just sustainers of scholarly commons. By applying the framework for governance and management developed by social scientists like Ostrom, libraries can succeed in offering robust, democratic alternatives to the market.

Governing the Scholarly Commons

As research libraries transition from hierarchical to collaborative structures, they are becoming more closely connected to the creators and users of scholarly resources. Already, librarians are playing a major role in fostering and organizing new models for creating and disseminating ideas. As control is relinquished to more democratic modes of governance and organization, what structures should replace earlier modes of

governance and management? Following the framework outlined by Ostrom and discussed earlier in this paper, self governance of these newly emerging commons will require clearly defined boundaries, the design and enforcement of rules, the extension of reciprocity, building trust and social capital, and communication channels.

No longer are research libraries confined to a specific place or schedule; their resources and staff are now diffused throughout the campus and beyond. Today's libraries are flatter, more agile organizations that can respond to the changing needs of their institutions. They are organizing services around content rather than function-based activities and building teams that combine various types of specialties like subject, cataloguing, instruction, and reference expertise that can work directly with user communities. But to succeed with this transition, libraries will need to reconsider not only their structures, but also the scope and boundaries of their responsibilities.

By venturing beyond dissemination into the creation and preservation of knowledge, libraries are extending their boundaries well beyond the edifices or structures that defined them in the past. As they embark on collaborative ventures, their new territories -- both on campus and beyond -- will need definition through careful negotiation among a variety of stakeholders, some looking to the library for guidance, and others competing with the library for control. New activities like classroom instruction and digital repositories raise questions of jurisdiction and priorities. What role will faculty and other academic colleagues play? How will rules be negotiated? Who will determine the scope and effectiveness of their activities? What kinds of reciprocity will be required for sustaining these activities? How will they build the trust of their new colleagues? And what kinds of communication channels will they need to establish and

maintain? Ultimately, how will libraries synthesize these disparate projects into a more integrated, coherent information creation and delivery system?

Financing the Scholarly Commons

Developing, sustaining, and governing scholarly commons will require significant investment in infrastructure and content to pay for start up and ongoing costs. While scholars may gain more free or low cost access under these new arrangements, someone must pay to sustain these resources. Moving from an unsustainable subscription-based structure will shift long-standing financial and social relationships. Many of the emerging scholarly commons are supported by foundations and other grant-making agencies, which are unlikely to sustain them indefinitely. At some point, these projects will need to generate revenues that replace the subscriptions and grants that either previously or now cover costs.

For open access publishing, the burden of production expenses is shifting from purchasers to creators. Such transitions require capital for starters, and then new streams of revenue for sustainability. Rather than charge subscriptions, open access publishers collect author and/or membership fees. One such publisher, BioMed Central (BMC), began by offering journals to libraries on a flat fee basis. Now BMC is asking institutions to pay membership renewals based on the estimated number of articles that faculty are likely to generate.[54] Understandably, librarians at affected institutions are outraged by this unannounced steep rise in fees. But the flat fee model paid by these libraries removes authors from any sensitivity to the costs of sustaining publications.[55]

As a result, new financial models may fail to solve all the problems they were designed to fix.

Indeed, these new publishing paradigms carry risks and costs for libraries, authors, and publishers alike, along with concerns that they might overlook the importance of peer review and drive commercial publishers out of business. Such institutions as Stanford, MIT, Harvard, Cornell, University of Connecticut, and North Carolina State University are balking at renewing multi-year Reed Elsevier licensing contracts and some are even discouraging faculty from submitting articles to their journals.[56] Commercial publishers like Reed Elsevier are beginning to feel the effects of these actions. Not only do they lose revenues from library subscriptions, but they also lose credibility with creditors. In the fall of 2003, a securities firm, BNP Paribas, judged the company to "underperform" because its subscription-based access was weak "compared to the newer and more successful article-fee based open access system."[57] According to Christine Lamb, author of a report about open access for Shore Communications, "So far most established scholarly journal publishers have chosen to view open access as a threat."[58] Threat or not, any transition is likely to create a void in the scholarly communication chain that impacts the academy in unexpected ways.

Beyond coping with rising subscription costs for both open access and commercial publications, many librarians worry about finding additional funds to finance the transition from subscription to a production business model. Low cost journals and digital archives may be welcome, but they are becoming available at a moment when libraries face serious budget constraints that limit their ability to pay for long-standing commitments, let alone new ventures. At the same time, universities will need to redirect

resources if they are to become publishers as well as consumers of their faculty's scholarship, and authors will need incentives and rewards if they are to migrate toward new publishing ventures that may demand high publication fees. As the Committee on Institutional Cooperation (CIC) has recommended, many of these new efforts to improve scholarly communication can build upon inter-institutional relationships already underway.[59] In short, new publishing ventures on or among campuses that involve libraries, academic presses, technology centers, and scholars will need sound business plans and not just grant fund to succeed.

Building Learning and Information Communities

The evolution of new paradigms for sharing scholarly resources requires the participation of user communities based on shared values and agreed-upon social norms. New learning technologies facilitate the development of learning communities where students and educators can collaborate to create and share knowledge using all forms of media. Within these communities, learners and scholars can interact by communicating ideas and engaging in discourse and problem solving. In the digital age, librarians are helping to create these learning communities, both within and outside the library, by fostering collaborative teaching and learning, where librarians and faculty become immersed with students, teaching as well as learning from them.[60]

Integrated digital learning centers are good examples that illustrate how research libraries have succeeded in negotiating new roles. These centers, which create an environment where old boundaries blur and many constituent activities flow across old unit divisions, are now established on many campuses in conjunction with academic

colleagues who run information technology services and teaching and learning facilities. Some of these spaces are called information commons, where disparate information resources are brought together by librarians and information technology staff. Others are referred to as learning commons, where students come together around shared learning tasks.[61]

A noteworthy library commons is located at the University of Arizona where the library, the University Teaching Center, and the Center for Computing and Information Technology developed a dramatic shared facility adjacent in partnership with other units on campus.[62] A similar collaboration between the Indiana University Libraries and University Information Technology Services offers a "technology and information center" with more than 250 individual and group workstations, reference services and resources, technology consultants, and a multimedia production laboratory. Since opening in September 2003, the library's commons has become a major hub of campus life, raising overall use of the library by 20%.[63] Another example of a learning community is designed for first-year students at Indiana University-Purdue University at Indianapolis (IUPUI), who are enrolling in special seminars or learning communities, led by a collaborative of faculty, staff, librarians, and administrators, who teach critical thinking skills that will enhance their learning experiences.[64]

Research libraries are also well positioned to facilitate the creation of information communities that enhance the social capital of scholarly commons. Library science professors Karen Fisher and Joan Durrance have examined how information communities unite people around a common interest through increased access to a diffused set of information resources. Scholarly commons can serve as the hub of these communities,

facilitating connections and collaborations among participants, the exchange of ideas, distribution of papers, and links with others who have similar interests and needs. Scholarly commons are more likely to success when the communities they serve benefit from increased access to and use of information, increased access to people and organizations, and increased dialogue, communication, and collaboration among information providers and constituents.[65]

Never before has collaboration been so essential for libraries -- essential to the successful introduction, development, and widespread utilization of scholarly commons. In the past, libraries cooperated on many levels and extended their reach around the world. But collaboration means something far more demanding than the cooperative endeavors relied upon in the past. It means the development of a common new mission and goals, new organizational structures, more comprehensive planning, additional levels of communication, new kinds of authority structures with dispersed leadership, and shared and mutual control. In order to transform into more collaborative organizations, research libraries will need new organizational frameworks, with serious commitments by administrators and their parent organizations. In addition, they must broker new relationships, entrepreneurial activities and communication structures. While these new relationships sound promising, they often face pitfalls, such as conflicting institutional priorities and competition for scarce funding. Furthermore, some universities may not be prepared to retool their organizations so as to contribute efficiently and effectively to the development of scholarly commons.

Advocating for Scholarly Commons

Universities and their libraries can no longer rely on the old adage: "Build it and they will come." Instead, they must devote scarce resources to projects chosen through careful consideration of user needs. To assess these needs, they must rely on focus groups, surveys, and other evaluation techniques to provide feedback for strategic planning. In addition, they must apply sophisticated packaging, advertising, and promotion techniques to encourage greater awareness of the valuable resources they are working hard to create and sustain on behalf of scholars.

More importantly, they must tell a compelling story about the value of a new scheme for managing their intellectual assets. Rather than continue an uphill battle to counter enclosure, they are well poised to offer a fresh approach to constructing a fundamental institution for the information age. But they must use language that explains how the extraordinary assets they have invested in advancing knowledge can reap more benefits for scholarship and society. Legal scholar Carol Rose believes that property arrangements are basically what "people have quite consciously talked themselves into." She stresses that "narratives, stories, and rhetorical devices may be essential in persuading people of that common good."[66] For scholarly communication, a new narrative is needed to persuade academics, librarians, policymakers and the public of the promises and opportunities of more open access in the digital age. The proponents of new paradigms must capture people's imagination and demonstrate how scholarly commons will transform educational institutions so they can meet the needs of the 21st-Century digital age. The Association of College and Research Libraries (ACRL), the Association of Research Libraries (ARL), and SPARC have launched a public relations

effort called "Create Change" that goes a long way toward telling a new story and communicating with a wider audience.[67]

To meet the challenge of access to information in the digital age, proponents of open access and scholarly commons need to band together to amplify their voices and extend their reach. Their individual efforts are impressive, but now they must mobilize a new movement comparable to the movement for environmental protection in the last two decades of the 20th century. James Boyle considers information to be an "ecosystem." He recommends creating coalitions of people currently engaged in individual struggles with no sense of the larger context.[68] He is joined by a growing list of practitioners including librarians and self- publishers, who recognize the need to identify and mobilize a broad array of individuals, information communities, and organizations concerned with the production and distribution of knowledge and ideas – people often inexperienced at working in concert to promote common concerns and collective action. The voices needing amplification range from authors, journalists, artists, musicians, scientists, and scholars to independent and academic publishers, lawyers, librarians, public interest groups, readers, listeners, viewers, and other users of information.

While a consensus about the need to create and sustain information commons is emerging, the challenge is to identify and bring together the voices of highly disparate groups and individuals who may or may not have experience organizing advocacy campaigns. Building powerful coalitions and partnerships will require extensive organizing and fundraising. In order to promote public access, those committed to building information commons must first find each other and then look far beyond the normal sources for allies. They must find common threads to tie various constituents

together and to recognize that allies on some issues may become enemies on others – for example, publishers and librarians, who coalesce in support of First Amendment causes but approach copyright and fair use very differently. While scholars have made significant strides in carving out new territory for producing and sharing their intellectual assets, many within the academy still remain unaware of the crisis and their role in solving it. Thus, potential partners may feel threatened by shifts in a market that could reduce or undermine their income and traditional support mechanisms.

Advocates must also articulate the positive economic value of the commons. Good examples and best practices abound, demonstrating that commons are a viable, effective alternative to creating and delivering information resources. Documenting these models and sharing them widely will help tell a story that resonates with policymakers, the media, and the general public.

If scholarly commons are to defend themselves against rival alternatives as suggested by Levine, librarians will need to continue to guide their institutions through the highly-contested information policy arena of copyright, distance education, next-generation Internet, and intellectual freedom issues. On campus, librarians also make a difference by educating administrators, faculty and students about their rights and responsibilities, and advising legal staff about the intricacies of license agreements, fair use, and other policies that affect both creators and users of resources. Indeed, their involvement with these issues shapes policy at the federal level.

By encouraging faculty to post articles to digital repositories, publish in open access journals, boycott expensive journals, and sign less restrictive copyright agreements, librarians can facilitate more open exchange of scholarship. The Creative

Commons offers a set of flexible copyright licenses that make an author's work available for others to build upon and share. These licenses help them dedicate their creative works to the public domain or license them as free for public use, with some rights reserved. Established in 2001 by Lawrence Lessig, James Boyle, and other cyberlaw and computer experts with support from the Center for the Public Domain, Creative Commons is increasing the sum of raw source material online, cheaply and easily.[69] As of January 2004, at least one million Web pages are now using a Creative Commons License.[70]

Research Opportunities

New models for creating and distributing information are proliferating. A survey of the diffusion of these efforts can provide an overview of the extent of adoption nationally. The scholarly community also needs a better sense of how these efforts are making a difference and why they are important to the future of the academic enterprise. As scholarly commons evolve, librarians and their colleagues need to learn more about what structures work most effectively and how they can best be managed and financed. Case studies of a variety of mature projects like arXiv.org can also inform the discourse about scholarly commons. Likewise, the impact of open access publishing must be closely monitored and evaluated. Do these efforts improve access and lower costs? Will scholars publish in them? Will tenure committees consider such publications worthy? Researchers who study commons can contribute insight into whether these new paradigms for creating and delivering information resources are succeeding and what must be done to ensure their survival. Moreover, research is needed in order to explore

the contributions of open public access to the advancement of science and the arts; narratives must also be compiled about the positive effects of access to information and the negative impact when access is denied.

Conclusion

Advocates for scholarly commons are making significant strides in designing and promoting new paradigms for information access. Now that they have demonstrated proof of concept, they must bring these disparate projects together to construct a fundamental research institution for the digital age. Collaborative partnerships are broadening the reach of these efforts while showcasing the value of these endeavors. While the challenges are great, the potential for success keeps growing. With so many new projects unfolding, the scholarly community is well-positioned to expand its appeal. Now is the time to create alliances that will reclaim the technological future of the academy. Without access to a technologically sophisticated scholarly commons in every academic community, many scholars and students will be left behind in the information age.

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[65] Karen Fisher and Joan Durrance, "Information Communities," *Encyclopedia of Community: From the Village to the Virtual World,* edited by Karen Christensen and David Levinson, vol. 2, Thousand Oaks, CA: Sage, 2003: 657-660; Joan Durrance, "The Vital Role of Librarians in Creating Information Communities: Strategies for Success," *Library Administration and Management,* vol. 15, #3 (Summer 2001): 161-168; and Joan Durrance, "Information Communities," web site, http://www.si.umich.edu/libhelp/infocomm.htm

[66] Carol M. Rose, *Property and Persuasion: Essays on the History, Theory, and Rhetoric of Ownership,* Boulder, CO: Westview Press, 1994, p. 6.

[67] Association of College and Research Libraries, Association of Research Libraries, SPARC, "Create Change: New Systems of Scholarly Communication, Washington, DC: Association of Research Libraries, October 2003, http://www.arl.org/create/resources/CreateChange2003.pdf.

[68] James Boyle, "A Politics of Intellectual Property: Environmentalism for the Net?" *Law in the Information Society,* 1997, http://www.law.duke.edu/boylesite/intprop.htm.

[69] For background information and licensing forms, see, *Creative Commons,* web site, Palo Alto, CA: Creative Commons, http://creativecommons.org/. See also, Glenn Otis Brown, "Academic Digital Rights: A Walk on the Creative Commons," *Syllabus,* April 1, 2003, http://www.syllabus.com/article.asp?id=7475; and Richard Poynder, "Reclaiming the Digital Commons: Investigative Report," *Information Today,* vol. 20, #6, June, 2003: 33-35.

[70] Electronic mail message to Nancy Kranich from Neeru Paharia, staff member at the Creative Commons, January 26, 2004, stating: "we do know there are ~1,000,000 linkbacks to the licenses, so a million webpages have licenses on them. No one really knows how many people that represents, or how many discreet [sic] objects."