

**A Research Program for Advancing New Models  
of Scholarly Communication across Disciplines**

A proposal submitted to the

Andrew W. Mellon Foundation's Grant Program in Scholarly Communications

by the School of Information Sciences, University of Pittsburgh  
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## A Research Program for Advancing New Models of Scholarly Communication across Disciplines

### Introduction and Motivation

In April 2007, the US National Science Foundation (NSF) and the UK Joint Information Systems Committee (JISC) sponsored a workshop on “data-driven scholarship.” The report<sup>1</sup> of that workshop concluded that:

- The widespread availability of digital content creates opportunities for new forms of research and scholarship that are qualitatively different from traditional ways of using academic publications and research data. We call this "cyberscholarship".
- The widespread availability of content in digital formats provides an infrastructure for novel forms of research. To support cyberscholarship, such content must be captured, managed, and preserved in ways that are significantly different from conventional methods.

The timing of this workshop was crucial. The sponsors noted that the long-predicted “transformation” of scholarly communication has also been long in coming. Notable and pioneering projects such as the arXiv open e-print archive, the National Virtual Observatory, and the National Center for Biotechnology Information have been appropriately credited for pioneering advances in the use of digital technologies to advance science. The success of these projects fostered the perception that science in the 21<sup>st</sup> century is becoming a truly collaborative endeavor, resulting in communities of scientists routinely contributing their data to shared repositories while lamenting that such success has not been more broadly adopted in the arts, humanities, and social sciences.

But the perception belies the reality. The vision of transformation of scientific discourse through digital technologies was strongly espoused in the report of the *NSF Blue Ribbon Advisory Panel on Cyberinfrastructure*<sup>2</sup>, a report commonly referred to as the *Atkins Report*. The introduction to that report observes that “[a]dvances in computational technology continue to transform scientific and engineering research, practice, and allied education.” It anticipates “an even more profound and rapid transformation – indeed a further revolution – in how we create, disseminate, and preserve scientific and engineering knowledge.” A subsequent report, *Cyberinfrastructure Vision for 21<sup>st</sup> Century Discovery*<sup>3</sup>, sustains this vision while paying tribute to the immense complexities involved in such a transformation. “The anticipated growth in both the production and repurposing of digital data raises complex issues not only of scale and heterogeneity, but also of stewardship, curation and long-term access.” The report envisions “a range of data collections and managing organizations, networked together in a flexible technical

architecture using standard, open protocols and interfaces, and designed to contribute to the emerging global information commons.” Clearly, much needs yet to be done to realize and capitalize on this vision for science and engineering.

The arts, humanities, and social sciences have not sat idly by while NSF champions the cause for transformative change in science and engineering. The American Council of Learned Societies (ACLS) published *Our Cultural Commonwealth*<sup>4</sup>, a report on cyberinfrastructure for the humanities and social sciences, espousing “a new cultural commonwealth in which knowledge, learning, and discovery can flourish.” The report takes note of the complex technological, cultural, economic, legal, and institutional constraints impeding transformative change in scholarly communication. Its recommendations address investment in cyberinfrastructure; development of policy fostering openness and access; a range of leadership initiatives to enhance cooperation, encourage digital scholarship, and establish national centers; and a foundation of open standards supporting the scholarly use of digital collections.

The NSF/JISC workshop was inspired by the Cyberinfrastructure vision but tempered by the slower-than-expected adoption of digital repositories supporting data-driven research throughout the scholarly community. In his position paper<sup>5</sup> prepared for that workshop, Sayeed Choudhury reflected on scholarly communication from an historic perspective and hypothesized that collaboration flourishes in “data rich” times. He posited that the Middle Ages were such a “data rich” time for humanists, during which they collaborated through a shared corpus of spoken word, written word, and illuminated manuscripts. “Rather than assuming some inherent characteristics of specific disciplines define their modes of scholarship or communication, perhaps it is the relative ease or difficulty with which they can generate, acquire or process data that ultimately influences scholarship.” Historians and other commentators on the Information Age have also argued that every era had a focus on information, albeit in a different form (see, for example, Michael E. Hobart and Zachary S. Schiffman, *Information Ages: Literacy, Numeracy, and the Computer Revolution* [Baltimore: Johns Hopkins University Press, 2000], whose title suggests the compelling characteristic for each age).

While a central conclusion of the NSF/JISC workshop affirmed that we are now, indeed, entering an era of *cyberscholarship*, creating opportunities for new forms of research and scholarship, these opportunities bring with them major infrastructural challenges, including a broad array of issues related to aggregation of information resources, the development and refinement of discipline-based methodologies, and expansion of the range of formal scholarly communication to include new forms of scholarship, such as *data journals*. Informal modes of communication among scholars provide a fertile area for innovation, as these modes are unencumbered by the traditions of formal scholarly communication on which such critical personal decisions as promotion and tenure are typically based. Yet, emerging challenges such as authenticity, reliability, and provenance of these digital materials illustrate the many new and interesting issues moving to the forefront, not unlike the issues accompanying the shift from orality to writing or script to print, documented by scholars such as Clanchy, Ong, Johns, Eisenstein, and others.

The implications for society, for higher education, and, particularly, for the schools that educate the next generation of information professionals are profound. Historically, scholarly information management has been the mission of academic libraries, and the professionals staffing them were educated in library science schools. But as scholarly communication is transformed through cyberinfrastructure, so also must the education of information professionals be transformed. Far from educating librarians for traditional roles in academic libraries, leading schools of library and information science are now transforming themselves into information schools (*iSchools*) to prepare information professionals to work with scholars across the academy to develop the new modes of scholarly communication and collaboration enabled by advancing cyberinfrastructure.

Therefore, the School of Information Sciences at the University of Pittsburgh is submitting this proposal to support the work of a senior scholar in data-rich areas of scholarly communication and education. The work is premised on an expectation of continuing challenge, opportunity, and promise resulting from the sustained and rapid growth of information. The project will focus on several driving questions, such as:

- How are disciplines re-examining scholarly priorities, reshaping methodologies, and redefining evidence bases in light of new media and new tools?
- Given the likely long-term nature of deep and sustained disciplinary transformation, what do information professionals need to know about individual disciplines, and specifically their use and management of information, in order to be more effective partners in the scholarly process of advancing knowledge?

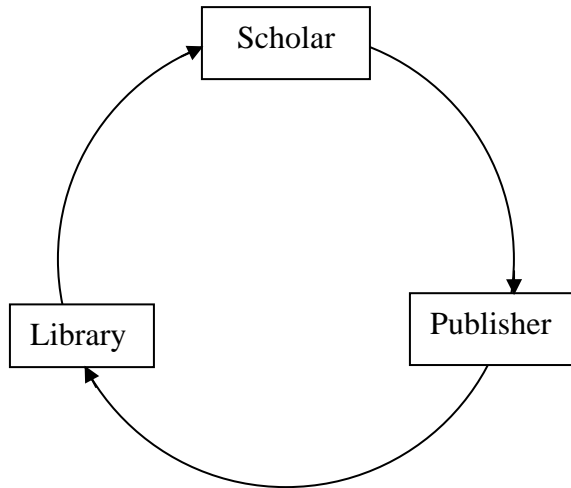
With the support of the Andrew W. Mellon Foundation – substantially supplemented by support from the University of Pittsburgh, SIS will seek, recruit and support a scholar who will investigate the future of scholarly communication, particularly in light of advances in cyberinfrastructure and new media. This senior scholar will have the opportunity to work with the University Library System's advanced facilities in digital repositories, with multi-disciplinary faculty at the School, and with other information schools across North America. The work of this scholar will impact both the future of scholarly communication and the students who will go forth to become the educators of tomorrow.

### **The Emergence of Cyberscholarship**

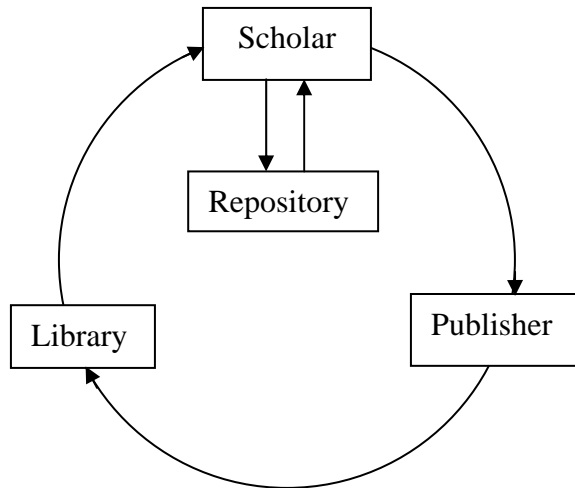
The various studies cited provide a clear, perhaps utopian, vision for the future of scholarly communication through advanced cyberinfrastructure. But none of them are sanguine about the vast array of challenges, from the technological through the cultural and legal. Experience with institutional repositories in higher education has only served to highlight the difficulties in transforming practice within scholarly disciplines. The deployment of these repositories, into which scholars are encouraged to record and preserve their output, has fallen short of expectations. The targeted scholars have neither the interest nor the patience for added work that does not directly advance their scholarly agenda, and institutions have typically been wise to avoid mandates, as has been shown

in a variety of studies, projects, and position papers in the archival community by individuals such as David Bearman, Margaret Hedstrom, Anne Gilliland, and Richard Cox. This calls into question the nature of the “service” provided.

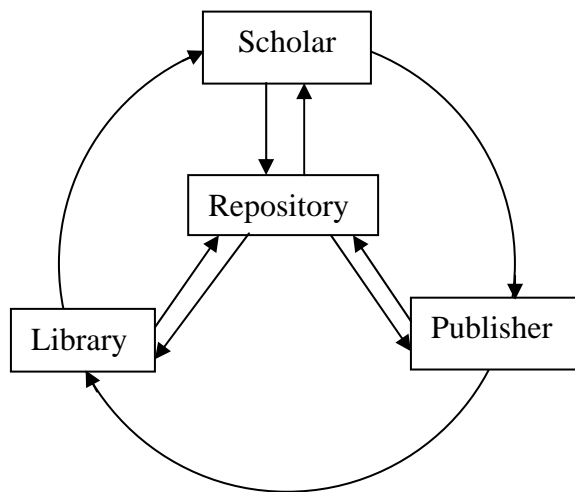
The traditional model of scholarly communications is a loop in which scholars use the library for their research, submit papers to publishers for peer review and editing for publication in journals or books, which are then purchased by the library to add to the foundation for future research.



In some disciplines (e.g., physics and genomics), repositories of digital resources have proven of value by increasing the ability of scholars to collaborate around a rapidly-changing corpus of research. This has resulted in a positive transformation of the culture within these disciplines, including the expansion of opportunities for “public scholarship” (commented on by Russell Jacoby, Richard Posner, Edward Said, and others). This opens up the idea that readily available and repurposed digital publications and sources can reach the public in ways that more traditional academic publishing can not, creating a more viable discussion between the academy and the public, and thereby enhancing the public utility of the university. Successes such as these have fueled expectations that related transformations are within reach in other disciplines through the same model.



With this motive in mind (as well as other local motives related to preserving the scholarly output of their institution), libraries have experimented with institutional repositories, and publishers have explored how they might benefit from (or be threatened by) such repositories.



But this is not a model that is easily adopted by many disciplines, whether in the sciences or the humanities, and this seeming failure provides the motivation for this proposal. The traditional model for scholarly communication very successfully defined and partitioned the roles of scholar, publisher, and library. Cyberinfrastructure challenges these partitions, and early experience with repositories is symptomatic of the magnitude of these challenges. And we can see signs of this in the work of such historians as Daniel J. Cohen and Roy Rosenzweig – in their *Digital History: A Guide to Gathering, Preserving, and Presenting the Past on the Web* (Philadelphia: University of Pennsylvania Press, 2005) – where they argue convincingly of the new opportunities for collaborative historical research and interpretation among scholars as well as between scholars and the

public on the Web in new kinds of Web sites and digital publishing. Others, such as Rick Prelinger, a well-known cyber activist, have put out a call for a new kind of citizen archivist. Some archivists, such as Richard J. Cox, are trying to extend this idea out into that professional community, suggesting a new mandate for education and work. As observed in the report of the NSF/JISC workshop report, a new paradigm for *cyberscholarship* is clearly needed.

### **Exploratory Research Supporting Transformation**

The School of Information Sciences (SIS) at the University of Pittsburgh has long been a pioneer in library and information science, with roots that go back to the days when Andrew Carnegie was investing in the nation's public libraries a century ago, creating a public need for professionals to manage and operate the rapidly expanding library infrastructure. The School is now adapting to the current set of challenges and opportunities of scholarly communication as a leader among the iSchools. Last year, the School's departmental structure of information science, library science, and telecommunications was removed in order to foster greater cross-disciplinary collaboration and to offer students a more holistic sense of the profession for which they are preparing. But faculty have a long tradition of disciplinary focus; transformation is going to require new ways of thinking and new models for education.

Visionary leadership by a senior scholar recruited specifically to focus on this set of issues is proposed. The University of Pittsburgh envisions partnering with the Andrew W. Mellon Foundation to bring an internationally recognized scholar to the School of Information Sciences to lead a major project in cyberscholarship that reaches beyond Pittsburgh to include other iSchools. The University proposes to substantially supplement the Mellon-provided resources in a project that thereby assures the full commitment of each party. We anticipate that the scholar recruited to this position will hold the rank of tenured full professor. The University Library System (ULS) at Pitt (particularly, the Information Systems Department and the Digital Research Library) will be a collaborative partner in this initiative, providing an institutional laboratory for experimenting with new models of scholarly communication. Of particular interest will be research conducted in collaboration with a range of disciplines to conceive of, evaluate, and test new models that meet the specific needs of those disciplines.

The senior scholar recruited to this position will rigorously examine the nature of scholarly communication in a set of diverse disciplines, hypothesize transformative requirements that support cyberscholarship for those disciplines, conduct experiments to test the hypotheses, and communicate the results in appropriate venues. Actual transformation of a discipline's use of the digital environment, rather than an accidental side-effect, is an anticipated outcome. The traditional study of *information behavior* has typically approached this area of inquiry by assuming a fixed system of information delivery and then seeking to understand how individuals interact with it. The work anticipated under this project is deeper and broader, explicitly considering the entire information environment within the domain of interest. The objective is to develop the resources and framework for understanding how scholars in different disciplines develop

their informatics (including bases of evidence and techniques for interacting with that evidence) as the underlying discipline adapts to the emerging digital technologies that make up cyberinfrastructure.

One hypothesis to be considered is whether placing information professionals into the scholarly disciplines, as partners to develop the cyberinfrastructure serving those disciplines, reduces the impediment to adoption of cyberscholarship. As embedded information professionals, their role would include examining the behaviors, requirements, and processes inherent in the discipline and using this knowledge to develop the cyberscholarship resources and tools to serve that discipline's particular needs, while concurrently attending to more general issues such as interoperability, sustainability, and curation. The viability of this approach is of fundamental significance to information schools and to academic libraries. As educators of information professionals for this new era, information schools need to be (and a few are) at the leading edge of exploratory development. Understanding and advancing the role of libraries and information professionals to support cyberscholarship is considered by many to threaten the traditional role of libraries (see, for example, John Berry's commentary in *Library Journal*<sup>6</sup>). The information schools believe that the future of libraries is not only **not** threatened, but actually enhanced by considering an expanded role for information professionals beyond the library's confines and into the disciplines. Libraries have historically been partners in academic scholarship. As scholarship itself changes, it is incumbent on those who manage libraries and those who educate the professionals who staff them to remain partners in scholarship. There was a time, a tradition actually, that the heads of academic libraries were themselves established scholars (one can think of the prominent historian Oscar Handlin heading Harvard's library as just one example). Cyberscholarship may signal a welcome return to such a tradition.

The scholar selected for this position will have first-hand experience in transformative, data-driven scholarship, either within a discipline or at the tools and infrastructure level, and a passion for extending this work to other disciplines. Examples of individuals who have demonstrated such leadership include:

- Ed Ayers, for his innovative use of the web for history research and education ("The Valley of the Shadow"),
- Robert Darnton, for his studies of the history of the book and advocacy of digital modes of scholarly communication,
- Gregory Crane, for his seminal work in bringing the study of the classics to the web through the Perseus Project,
- Peter Murray Rust, for his advancement of text and data-mining across heterogeneous data sources in chemistry,
- Herbert Van de Sompel, for his transformative work on tools and infrastructure, most recently including the Object Re-Use and Exchange (ORE), and
- Gary Marchionini, for his advancement of tools and techniques for managing and sharing digital video collections through the Open Video Project,

These individuals are listed for illustrative purposes only; the recruitment process will be fully competitive and open. But beyond their illustrative role, consider that the first four reflect visionary ambitions of disciplinary scholars without the direct support of iSchools.



As such, they are imaginative and exceptionally valuable contributions that illuminate the possible, but that contribute less to scholars in other disciplines repeating or extending their successes. The last two, in contrast, are the product of scholars who either are in an iSchool (Marchionini) or work in close collaboration with them (Van de Sompel).

The sample hypothesis regarding placement of information professionals into the scholarly disciplines is intended to explore and develop effective strategies for not only enabling more disciplinary scholars to advance their respective fields, but also to contribute to the shared commons of infrastructure on which these and other disciplines depend. Early (and continuing) work of the incumbent will seek to identify and recruit imaginative and visionary scholars (represented by the first 4, above) to cooperative projects that link their interests with information professionals who focus on infrastructure (represented by the last 2, above). Whether such teaming actually advances the vision of disciplinary scholars and contributes to the development of scalable, interoperable infrastructure is the question. Evidence supporting the hypothesis is provided by the collaboration between Gregory Crane and Gary Marchionini on the Perseus Project, where Gary was responsible for evaluation of the project.

The proposed approach places graduate students who are under the supervision of the incumbent into internship relationships with the disciplinary scholar. The intern will seek to understand the information behaviors inherent to the discipline, to assess the requirements underlying the scholar's vision, to potentially reshape the vision in light of work in other fields, and to contribute directly to the development of a system realizing the vision. The incumbent will assure that the intern's work is appropriately instrumented and contributes to our collective knowledge of advancing scholarship.

### **The University of Pittsburgh**

The University of Pittsburgh and the School of Information Sciences (SIS) are exceptionally well positioned to pursue this endeavor. SIS is one of the nation's pioneering schools in the education of information professionals, with a history that reaches back more than 100 years. Throughout that century, the School has built and maintained a tradition of excellence and innovation in education, research, and professional activities pertaining to the information sciences. The SIS faculty, staff, students and programs – uniquely interdisciplinary, multicultural, and international by design – are dedicated to the building of a global society and an informed citizenship based upon access to reliable and useful information.

SIS offers several degree-granting programs: Bachelor of Science in Information Science; Masters of Science in Information Science; Master of Science in Telecommunications; Master of Science in Library & Information Science; Ph.D. in Information Science; Ph.D. in Information Science with a concentration in Telecommunications; and Ph.D. in Library and Information Science. The degree programs have garnered outstanding reputations both nationally and internationally. For example, the Master of Library and Information Science degree, which is accredited by the American Library Association, is ranked **seventh in the nation** by *U.S. News &*

*World Report*. Currently, there are 750 students enrolled at the School across the four degree programs. The School has garnered a national and international reputation for scholarly research and communications, particularly in the leading edge fields of digital repositories and cyberinfrastructure.

**SIS** has established itself as one of the leading institutions (as well as a founding member) of the iSchool consortium, a consortium of 19 schools or colleges in the U.S. and Canada which offer degrees in the Information Sciences. The Dean of SIS, Ronald L. Larsen, is the current leader of its governing body, the iCaucus.

Dean Larsen served as the leader of DARPA's digital library and information management programs in the late 1990s and has since led two major NSF workshops on topics closely aligned with cyberscholarship, including the aforementioned workshop sponsored by the NSF and the Joint Information System Committee. In 2008, the School will host the Joint Conference on Digital Libraries, involving more than 400 scholars and practitioners from academia, government, and industry who are using the digital repositories of today...and designing such systems for the future. As such, the school is well prepared to support this proposal and to collaboratively engage other iSchools in this venture, as appropriate.

SIS's 32 faculty are highly multidisciplinary, providing a foundation that cuts across fields as varied as cognitive psychology, electrical engineering, computer science, library science, history, ethics, and political science. Collaboration between SIS faculty and faculty in computer science, electrical engineering, business, medicine, and public and international affairs is particularly strong. The faculty has ongoing research projects in a wide arena of disciplines, ranging from cross-lingual interfaces to wireless networks, to information assurance. These projects are supported by a diverse group of agencies including the National Science Foundation, the Institute of Museum and Library Services, DARPA, and more. Each of the School's graduate programs offers both Masters and Ph.D. degrees. With nearly 100 Ph.D. students, SIS provides an environment of intellectual vitality for research across a broad array of topics.

For this project, the University Library System will provide facilities for use by the recruited senior scholar in cyberscholarship. The University has invested substantially in its **University Library System** (ULS) to position it strategically for a digital future. The **Information Systems Department** (12 FTE) provides computing and network support for 20 libraries, systems development and administration for dozens of local systems and services, and professional data center operations. The ULS data center supports over 70 Windows and UNIX servers plus networked storage, backup and recovery operations, and advanced system monitoring tools, all in a secure, environmentally controlled setting. The **Digital Research Library** (7.3 FTE) is responsible for creation and delivery of Web-accessible digital collections, primarily through digitization of analog materials from the ULS's collections. The DRL also serves as a knowledge resource within the ULS for digital library issues and developments. The ULS provides extensive **Web Services** (3.7 FTE) that support the ULS Web presence, provide consulting services, and

integrate a wide range of vendor-provided Web-based services into a seamless offering to library patrons.

The ULS is deeply committed to its role as publisher and its responsibility to aid in the transformation of scholarly communication. In the last decade, the ULS has pursued electronic publishing, both through digitization of its own collections, and by providing services for direct author publication of born-digital documents. The results of these efforts are freely available to the worldwide research community through the **D-Scribe Digital Publishing Program** at <http://www.library.pitt.edu/articles/digpubtype/>. D-Scribe comprises over 60 collections with digitized content from library collections (books, journals, maps, images and other documents), plus numerous author self-archiving repositories, such as Electronic Theses and Dissertations (ETD's), electronic journals, and grey literature including working papers, government documents, preprint articles, conference papers and technical reports.

Rather than building a single general-purpose institutional repository, an approach that has not always met with widespread acceptance among content producers within the academy, the ULS fosters relationships and builds services to transform publishing models within subject-specific research communities. With this background, the ULS is unusually well positioned to be a partner with the School of Information Sciences to advance cyberscholarship in creative and responsive ways.

The first repository project at the University of Pittsburgh was the PhilSci Archive. Now in its eighth year, the **PhilSci Archive** (<http://philsci-archive.pitt.edu/>) is now the premier preprint site for the philosophy of science, and attracts articles from top scholars worldwide. The editors of this repository are internationally recognized scholars in the field and are now almost fully self-sufficient in the ongoing operation of the archive. PhilSci Archive is based on EPrints software from [www.eprints.org](http://www.eprints.org).

Other EPrints archives at the University of Pittsburgh include:

**Archive of European Integration** (<http://aei.pitt.edu/>), an electronic archive for publications on European integration, including key official European Union documents;

**Aphasiology Archive** (<http://aphasiology.pitt.edu>), an archive of papers presented at the Conference on Clinical Aphasiology from 1972 to the present; and the

**Minority Health Archive** (<http://minority-health.pitt.edu>), a joint project with the University of Pittsburgh's Center for Minority Health to offer a repository for documents pertaining to minority health issues.

The ULS's Electronic Theses and Dissertations (ETD) system has been operational since 2001, and since 2004, ETD's have been mandatory for all graduate programs with a thesis requirement. The ETD system now contains 1,783 theses and dissertations and

grows at the rate of approximately 400 per year. For more information, see <http://www.pitt.edu/~graduate/etd/>.

This year, the ULS began offering support for the **publication of electronic journals**. Two fully-refereed scholarly journals (soon to be announced) will convert from print to electronic publication during 2008. Using Open Journal Systems software (OJS), the ULS will support direct author submission and full workflow processes for journal managers, subscription managers, editors, reviewers, copy editors and proofreaders.

The ULS also provides an **Electronic Course Reserves** system, which supports classroom instruction by delivering a wide range of materials to students through a single interface, including remote subscription-based resources, digitized book chapters and articles, and streaming audio.

All ULS digital collections in D-Scribe have been designed to comply with the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH). The ULS is currently engaged in several projects using the OAI protocol, both to make our local repositories accessible to the world, and also to build new access points for document repositories at Pitt and beyond.

**AEIplus** is a search engine based on the OAI standard that provides simultaneous searching of the Archive of European Integration (AEI) and the European Research Papers Archive (ERPA). Except for Europa, AEIplus constitutes by far the most comprehensive and accessible single interface to materials on the European Union and European Integration freely available on the Internet.

The **DRL** provides a comprehensive array of capabilities to create, index and deliver digital library collections. Three Web servers host DRL content, including streaming AV material.

#### Digitization of Source Material

The DRL supports two DigiBook scanning devices capable of digitizing bound books and flat artwork up to 35 x 50 inches. It also owns three other scanning devices capable of digitizing photographic prints or graphic material (e.g., manuscripts, music scores, postcards, etc.) up to 11 x 17 inches, photographic negatives and 35mm slides, double-sided loose sheet texts, bound monographs, and single page flat objects.

#### Metadata Services

The DRL has the capability to capture *structural* and *administrative* metadata for digital objects, but collection of *descriptive* metadata is usually performed by content holders or through an arrangement with the University Library System's Technical Services department. The DRL maintains an up-to-date knowledge of metadata schemes used by the digital library community, and assists partners with the selection of metadata schemes.

## Online Access to Digital Library Collections

The DRL primarily uses the open source Digital Library eXtension Service (DLXS) middleware, developed and distributed by the University of Michigan's Digital Library Production Service. The DLXS middleware is organized around four *classes* of material: text, images, finding aids, and bibliographies.

The ULS is clearly positioned to be a cooperative and creative partner in joint research and development. It is prepared to share expertise and infrastructure to support its mission of transforming models of research and scholarly communication through digital publishing.

### **The Program Plan and Budget**

The initial project will run for five years. While the recruited scholar will set the agenda, the types of activities pursued will likely include:

- Research on digitally-enabled scholarly communication, in collaboration with (and supported by the infrastructure of) the ULS,
- Teaching doctoral seminars with various students cutting across the three SIS programs, such as with the large cluster of doctoral students preparing to be new educators of future archivists who are particularly interested in such research projects,
- Experimental internships of information school students in other disciplines to develop informatics strategies,
- Informatics workshops in collaboration with target disciplines,
- Instrumented pilot projects between libraries and disciplinary scholars to test cyberscholarship hypotheses,
- Coordination with institutions and agencies who are shaping the future of scholarly communication, including but not limited to federal agencies such as NSF, IMLS, NIH, and NEH, international organizations such as JISC and SURF, and private foundations such as the Andrew W. Mellon Foundation and the Getty Trust, and
- Collaboration with the intellectual leadership of cyberinfrastructure programs in the sciences and humanities.

The University of Pittsburgh seeks funding of \$150K per year (increasing at approximately 2% per year) for a period of five years from the Andrew W. Mellon Foundation and proposes to substantially supplement that funding to provide a programmatic budget of approximately \$350K per year to pay the salary and benefits for the senior scholar, pay the salary and benefits of a half-time administrative assistant, provide part-time IT support, support one Ph.D. student, and provide seed programmatic funding. A 5-year budget summary is included with this proposal. We will seek to recruit a scholar who will hold a 2-term per year tenured professorship in the School of Information Sciences. The incumbent will be expected to leverage the seed programmatic funding to acquire additional resources required to fulfill the agenda the individual

develops. The scholar will teach two courses per year, typically including a doctoral seminar and an elective course in the Masters program. S/he will have the opportunity to offer these courses over Pitt's online education infrastructure, extending their availability to students at other iSchools. S/he will also lead a Research Interest Group (RIG) in SIS on cyberscholarship, providing the intellectual leadership for an activity that is expected to become a major center at SIS.

Regular faculty in SIS teach four courses per year, pursue an active research agenda (including seeking funding), and serve the university, the community, and their profession. The scholar recruited for this position will be at a significant advantage with half the course load of others, dedicated administrative and IT support, an assigned Ph.D. student, and seed funding.

Award of this grant proposal by the end of 2007 will enable SIS to formally launch an open and competitive search early in 2008 to recruit a senior scholar. While the objective is to launch the project in September 2008, the actual date must fundamentally depend on a successful recruitment. This process could easily be delayed in the search for the best, rather than the most available, scholar. We are very optimistic that the combination of existing programs, infrastructure, intellectual opportunities, and the reputations of the School of Information Sciences and the Andrew W. Mellon Foundation will result in a successful recruitment and an exciting and visionary program of research in cyberscholarship.

### **Assessment**

The University of Pittsburgh has undertaken an initiative to institutionalize a culture of assessment through which we continually evaluate the success of our educational programs and feed the results of those assessments back into our academic planning processes. On November 9, 2006, the Council of Deans approved assessment guidelines<sup>7</sup> to be used throughout our programs. These guidelines will be adapted to assess learning outcomes relevant to the work proposed here.

The School of Information Sciences additionally requests each faculty member to document their goals annually, and employs a parametric model to objectively measure the productivity and scholarly output of each faculty member.

The program proposed will be evaluated after two years and after four years, specifically examining the success of the program to:

- Engage scholars in other disciplines in a creative examination of their information uses and behaviors,
- Introduce innovations to their information uses and behaviors that are strategically aligned with advancing scholarship in the respective discipline,
- Conduct instrumented experimentation to assess the viability of the proposed innovations, and
- Produce independent scholarship to inform the scholarly community on the progress of this initiative.

A major component of the work conducted in this project will require community building and outreach to other disciplines with the intention and expectation of developing new partnerships between information professionals and other disciplines. One assessment measure will examine the number of students, interns, and graduates of iSchools who become partners and peer scholars, embedded in other disciplines.

**Proposed Budget** - See attachment

### **Budget Justification**

The proposed budget is subject to refinement in collaboration with the scholar hired to this position. The budget includes administrative, technical, and intellectual support, as well as equipment, travel, and seed programmatic funding. The relative proportions may vary, depending on the needs and interests of the incumbent. The budget reflects our current best estimate of the resources required to assure the success of this project.

#### Personnel Costs

The starting salary for the senior scholar is roughly 10% higher than the average salary of full professors at SIS. The School of Information Sciences (SIS) is requesting 75% of the scholar's salary in Years 1 and 2, 73% in Year 3, and 70% in Years 4-5, and will cost share the balance. The starting salary for the assistant to the scholar is the mid-point for a staff member at the level at which the assistant position will be filled. The Graduate Student Researcher (GSR) will provide IT support at 10 hours/week. The stipend for the Ph.D. student (20 hours/week) is moderately between the minimum and maximum mandated by the Office of the Provost for graduate student researchers for three terms of work. Funding for the assistant, for the GSR, and for the Ph.D. student will be cost-shared by SIS.

In the current fiscal year, the University of Pittsburgh has established fringe benefit rates of 34% for faculty, 35.5% for staff and 50% for graduate students for non-federally funded projects. SIS is requesting only those fringe benefits associated with the portion of the scholar's salary requested from the Foundation. Other fringe benefits will be cost shared by SIS. The same rates were applied to the full period of the proposal since rates for future years have not yet been published.

#### Equipment

It is estimated that in Year 1, PCs will be needed for the senior scholar, his/her assistant, the GSR, and the Ph.D. student, as well as at least 1 laptop and a server for research. In subsequent years, lesser amounts will be spent on equipment upgrades, replacements, software, etc.

#### Travel

The scholar will attend conferences and workshops (domestic and international) to present papers and confer with colleagues. SIS is requesting partial funding each year to help defray these costs.

#### Program Seed Funding

The budget includes program seed funding of \$25K for year 1, increasing at a rate of 4% per year thereafter. This funding is intended to provide programmatic flexibility to the senior scholar recruited to the position to initiate activities key to the success of the overall program.



While the specific uses will be decided by the incumbent, the following provides the rationale for the amounts proposed. In the first year, a 2-day planning workshop is envisioned that would engage 15 - 20 scholars in development of a 5-year program plan. A budget of \$20,000 is proposed for travel, lodging, and related expenses of the participants. The first year will also kick off a university colloquium series featuring leading national and international scholars. Four colloquia per year are envisioned, with a budget of \$5,000 to cover travel and a modest honorarium for the speaker, and refreshments for the participants.

In subsequent years, as the program attempts to build interest in target disciplines, small workshops that engage scholars in those disciplines are anticipated as an initial vehicle to build interest and to define programmatic scope and approach. A budget of \$5,000 is proposed for these workshops. Another key element of the program is the expected placement of student interns into target disciplines to conduct fieldwork and to assist in the development of new tools and techniques supporting cyberscholarship in those disciplines. The budget allows for three such interns in the second and third years and four interns in the fourth and fifth years. The School's existing "Partners Program" provides the administrative support structure for these internships, for which they get 3 credit hours per term and a matching tuition credit from the School.

The final budget items proposed for seed funding provide support for formative assessment toward the end of the second year and into the third year, when the program should be well underway, and for summative assessment after four years, as the program approaches its end.

The following table summarizes these proposed uses of the seed program funding.

| Cyberscholarship<br>Seed Program Funding |          |          |          |          |          |
|--|----------|----------|----------|----------|----------|
|  | Year 1   | Year 2   | Year 3   | Year 4   | Year 5   |
| Planning / Scoping Workshop              | \$20,000 |          |          |          |          |
| Disciplinary workshop                    |          | \$5,000  | \$5,000  | \$5,000  |          |
| University-wide Colloquium Series        | \$5,000  | \$5,000  | \$5,000  | \$5,000  | \$5,000  |
| Formative assessment                     |          | \$2,500  | \$2,500  |          |          |
| Summative assessment                     |          |          |          |          | \$5,000  |
| Partners program                         |          |          |          |          |          |
| \$10 / hr * 10 hours / week = \$100 / wk |          |          |          |          |          |
| 15 wks / term = \$1500 / intern / term   |          |          |          |          |          |
| Interns placed in disciplines            | 0        | 3        | 3        | 4        | 4        |
| Partners program internships             | \$0      | \$13,500 | \$13,500 | \$18,000 | \$18,000 |
| Total                                    | \$25,000 | \$26,000 | \$26,000 | \$28,000 | \$28,000 |

Inflation

All costs have been increased by 4% annually to allow for inflation.

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<sup>1</sup> Larsen, Ronald L., and Arms, William Y., “The Future of Scholarly Communication: Building the Infrastructure for Cyberscholarship,” Report of a workshop sponsored by NSF and JISC, April 2007 (available at [www.sis.pitt.edu/~repwkshop](http://www.sis.pitt.edu/~repwkshop)).

<sup>2</sup> Atkins, Daniel, “Report of the National Science Foundation Blue-Ribbon Advisory Panel on Cyberinfrastructure,” Document Number cise051203, January 2003.

<sup>3</sup> “Cyberinfrastructure Vision for 21<sup>st</sup> Century Discovery,” National Science Foundation, Cyberinfrastructure Council, Document Number NSF 07-28, March 2007.

<sup>4</sup> Welshons, Marlo, ed. “Our Cultural Commonwealth, The report of the American Council of Learned Societies Commission on Cyberinfrastructure for the Humanities and Social Sciences,” December 2006 (available at [www.acls.org/cyberinfrastructure](http://www.acls.org/cyberinfrastructure))

<sup>5</sup> Choudhury, Sayeed, “The Relationship between Data and Scholarly Communication,” position paper submitted for the NSF / JISC Repositories Workshop, April 2007.

<sup>6</sup> Berry, John, “Why I-Schools Need Library,” Library Journal, 9/15/07, (available at [www.libraryjournal.com/article/CA6476391.html](http://www.libraryjournal.com/article/CA6476391.html)).

<sup>7</sup> Guidelines for Documenting the Assessment of Student Learning Outcomes at the University of Pittsburgh (available at [http://www.pitt.edu/~provost/assessment\\_guidelines.pdf](http://www.pitt.edu/~provost/assessment_guidelines.pdf)).