

## WHITE PAPER: A DIGITAL REPOSITORY AT LOYOLA UNIVERSITY CHICAGO

Eben English, Digital Services Librarian

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### Abstract

Loyola University Libraries propose to develop a suite of services, systems, and online tools for the purpose of collecting, storing, organizing, and providing access to digital assets produced by Loyola University related to research, teaching, and learning. Functioning collectively as a “digital repository,” these initiatives will work in concert to facilitate a wide range of scholarly and archival activities, including content creation, collaboration, resource sharing, author rights management, digitization, preservation, and access by a global academic audience. This open-access repository will provide for increased discoverability, visibility and access to scholarship created at Loyola, and support the management and long-term preservation of the intellectual output of the university community.

### Introduction

One of the central goals of the university is the creation of knowledge through the practices of teaching, research, and scholarship. However, we do not create knowledge for its own sake. We produce knowledge so that it may be imparted — to our students, to our colleagues, to the academy, and to society — and so that it may have a useful impact on the world around us. We cannot educate in a vacuum. The *dissemination* of knowledge is then logically also one of the university’s primary functions.

Digital technologies and networks have revolutionized the transmission of information and knowledge in every area of modern life. They have also given rise to new, rapidly-proliferating forms of communication and content — forms which have rightly been embraced by scholars and universities as they strive to communicate more effectively and connect with new audiences. Libraries have also welcomed this revolution, offering online access to an ever-growing cornucopia of scholarly content and resources as part of their mission to serve the information needs of the university. As part of this revolution, the means of disseminating information—once concentrated in the hands of formal publishing entities—are now available to any organization or individual with the ability to wield them.

However, the ease with which digital information can be created and shared also creates challenges and responsibilities for managing and preserving it over the long term. The ephemeral nature of the Internet and the impermanence of digital file formats necessitate a coordinated effort to ensure that information is discoverable, accessible, sustainable, and persistently available in the future. The ability to manage data effectively has proven to be one of the most significant assets of any successful organization. The

investments made by the university community in the production of research and knowledge must therefore be cared for and protected.

The situation before us can be described thusly: the university (the patron of knowledge creation) has a fundamental obligation to share and disseminate its collective intellectual output. Faculty, instructors, and students (the producers of teaching and knowledge) have a desire to communicate their ever-growing and diverse body of work to society. Libraries (the stewards and curators of knowledge) have a mission to organize, provide access to, and preserve this output for future generations. To meet these needs, these stakeholders must collaborate together, taking full advantage of digital communication opportunities to create a platform of systems and services to digitize, store, organize, preserve, and disseminate the products of teaching, learning, and research.

These ideas are not new. They form the backbone of a movement that has been taking place at higher learning institutions across the world for almost a decade. Faculty, administrators, librarians, information specialists, and technologists have been working together to develop a new paradigm of scholarly communication, one that places the power of publication in the hands of universities, restores ownership of intellectual content to information producers, provides an outlet for disseminating the vast range of research and teaching output that has been neglected by traditional academic publishing, and allows for structured management and preservation of scholarly assets.

The engine underneath the hood of this paradigm is the combination of software, hardware, personnel, and services often referred to as a “digital repository” or “institutional repository.” This moniker is somewhat misleading, however. While it is true that a repository can be thought of in the conventional sense as “a place where items can be kept for storage and safekeeping,” it is much more than that. In its highest form, a digital repository is a research resource in itself, a place for collaboration and interaction between scholars, a networked system supporting the sharing and repurposing of research data, and a showcase for the scholarship fostered by its sponsoring institution.

This paper will provide a concise background on the history of repositories in academia, discuss the basic principles behind the call for open access to scholarly research, and lay out the rationale and vision for a digital repository at Loyola University Chicago.

### **Background: A Brief History of Digital Repositories**

The concept of a digital repository—an online library of publicly accessible digital research materials—is almost as old as the Internet itself. The Internet and World Wide Web, after all, were first used by scientists in defense, aerospace, and nuclear physics to communicate the results of their work more rapidly than was possible by traditional journal publication.<sup>1</sup> However, it was not until the mid-1990s,

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<sup>1</sup> Gillies, James. *How the Web Was Born: The Story of the World Wide Web*. Oxford: Oxford University Press, 2000.

when networked computing and Internet access became more widely available in academic environments that the first repositories began to truly flourish. These repositories were subject-based, allowing researchers from different institutions to post pre-prints of articles in advance of publication, and were primarily centered around scientific disciplines such as physics, chemistry, and biology, where rapid dissemination of results is crucial.

Institutional repositories—networked digital collections dedicated to preserving and providing access to the diverse scholarly content of an academic institution (or consortia of institutions)—began to proliferate in the early 2000s as the result of the convergence of several factors. First, the advances of digital publishing technology and online access created opportunities for libraries (traditionally collectors and managers of information) to enter into the dissemination field with only a fraction of the cost (or bureaucratic maneuvering) of establishing or maintaining a university press. Second, the costs associated with storing and hosting large amounts of data declined precipitously. Third, universities began to chafe at the rapidly escalating costs of traditional print and online journals, whose pricing, copyright, and publishing models are increasingly out of touch with technological change and the need to distribute research in a timely fashion. Lastly, the volatility of the publishing market resulted in increasing concerns over the long-term preservation of digital scholarly research material—a concern which remains relevant to this day. In response to these conditions, universities began to implement digital collection systems which would provide the basis for an open-access, disaggregated, widely distributed model of disseminating scholarly research while at the same time allowing for preservation and management of the collective intellectual output of the institution.

Over the past ten years, repositories of this nature have been established at hundreds of academic institutions around the globe, including nearly every major university in the United States.<sup>2</sup> Open-source repository management software systems have been created through the combined efforts of major universities (such as MIT and the University of Southampton in the U.K.), philanthropic foundations (including the Andrew W. Mellon Foundation), governmental agencies (such as the Institute of Museum and Library Services), and leaders in the technology industry (Hewlett-Packard). Within our own Association of Jesuit Colleges and Universities, repositories have been implemented at Boston College, Fordham, Marquette, and Xavier, among others.

Recently, the focus of institutional repositories has shifted from the exclusive collection of peer-reviewed faculty-authored content to the pursuit of a much wider array of material not traditionally represented by journal-based publications, such as gray literature, conference presentations, data sets, archival materials, dissertations, and theses, as well as university documents and digitized primary source materials. This shift indicates a desire for digital repositories to be used not as replacements or usurpers of current scholarly publishing systems, but rather as a means to support evolving research

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<sup>2</sup> Rieh, Soo Young, Karen Markey, Beth St. Jean, Elizabeth Yakel, and Jihyun Kim. "Census of Institutional Repositories in the U.S." *D-Lib Magazine* 13, no. 11 (11, 2007).  
<http://www.dlib.org/dlib/november07/rieh/11rieh.html>.

practices, to legitimize new forms of digital scholarship and dissemination, and to give voice to neglected works which deserve a wider audience.

### Why Open Access?

“Open access” means exactly what its name implies: information which can be freely accessed by anyone, regardless of institutional affiliation, academic credentials, race, color, religion, national origin, ancestry, sex, sexual orientation, age, disability, marital status, or any other classification. It represents the democratization of information as a public good in the service of furthering human progress. The values espoused by the open access philosophy closely mirror our university’s mission, which speaks to the need for “knowledge in the service of humanity” and “learning and leadership in openhanded and generous ways to ensure freedom of inquiry, the pursuit of truth and care for others.”<sup>3</sup> These values also intersect with the principal objective of the digital repository project, which is to share the wealth of scholarly information and research produced at Loyola with a global academic audience.

A number of recent developments in academia have brought the issue of open access into the spotlight. In January 2008, the National Institutes of Health (NIH) announced a revised Public Access Policy that requires scientists publishing work supported by NIH funds to submit final peer-reviewed journal manuscripts to the publicly-accessible PubMed Central digital archive upon acceptance for publication.<sup>4</sup> This announcement was followed in February by news that the Faculty of Arts and Sciences at Harvard University had unanimously voted to adopt a policy to require that all scholarly articles produced by faculty members be made freely available in an open-access repository, a policy that was also later adopted by the Harvard School of Law and Stanford University’s School of Education.<sup>5</sup> One of the primary reasons behind both of these proclamations was that the university and the public should no longer be required to “buy back” the results of research and scholarship funded by institutional or taxpayer funds.

Despite these significant events, myths about open access continue to pervade academic culture. Some faculty fear that open access means the erosion of the peer-review process. However, open access is fundamentally separate from peer-review; rather it is a decision on how to disseminate information rather than how it should be edited.<sup>6</sup> Another popular misconception is that open-access publishing will threaten society and publisher profits, leading to less funding for research and quality control. However,

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<sup>3</sup> “Our Mission- Loyola University Chicago,” n.d., [http://luc.edu/mission/mission\\_vision.shtml](http://luc.edu/mission/mission_vision.shtml).

<sup>4</sup> “NOT-OD-08-033: Revised Policy on Enhancing Public Access to Archived Publications Resulting from NIH-Funded Research,” n.d. <http://publicaccess.nih.gov/policy.htm>.

<sup>5</sup> Young, Jeffrey R. “Harvard Faculty Adopts Open-Access Requirement.” *The Chronicle of Higher Education*, February 12, 2008, sec. Books. <http://chronicle.com/article/Harvard-Faculty-Adopts/40447/>.

<sup>6</sup> The Directory of Open Access Journals (<http://www.doaj.org/>) lists over 5,500 open-access scholarly journals that “exercise peer-review or editorial quality control.”

there is no evidence that the revenues for scholarly publishers are declining, despite the continuing proliferation of freely available research being published online.

Open access has the ability to open up new audiences for scholarly content, especially researchers across the globe who may have limited or no access to increasingly expensive academic journals. Numerous studies have shown that open-access articles are cited far more frequently than those published in traditional subscription-only journals, which means that the fruits of the research process are more widely used and make a greater contribution to their discipline.<sup>7</sup>

### **Why Build a Digital Repository?**

We as educators, and the university as a whole, have an obligation to ensure that our intellectual output is made widely available and preserved for the historical record, as collectively this material represents a valuable resource which should be shared with a global audience, contributes to our and the university's significance within the academic community, and helps demonstrate the societal and economic relevance of our endeavors.

Currently, the majority of this scholarly material is not collected or preserved in any systematic or structured fashion, and much of it is not available outside the walls of the academy, nor is it efficiently made visible to web search engines through which most academics conduct their research. Without a plan of action for collecting and managing these assets, their discoverability and availability over the long term cannot be assured. Therefore, a digital repository is needed to provide a central portal to house, organize, and disseminate this output.

### **A Vision for Loyola's Digital Repository**

The purpose of the repository will be to organize, preserve, and provide access to the full range of academic and scholarly material created by the Loyola University Chicago community in digital form for the benefit of Loyola students, faculty, staff, and the larger academic community. It will reflect the core values of the university's dedication to "knowledge in the service of humanity," providing an open-access gateway to a wealth of scholarly information and knowledge.

The initial priority of the digital repository project will be to establish an enterprise-level, standards-compliant, sustainable, secure, networked system to collect, store, organize, and provide access to digital assets produced by members of the Loyola community related to research, teaching, and learning

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<sup>7</sup> Swan, Alma. "The Open Access citation advantage: Studies and results to date." Technical Report, School of Electronics & Computer Science, University of Southampton, February 2010.

<http://eprints.ecs.soton.ac.uk/18516/>.

which are of demonstrable value to the larger academic community and/or to the public, reflect the intellectual and academic standards of the university, and warrant enduring access. However, this project will not only encompass the creation of a hardware- and software-based system to perform the everyday tasks of ingestion, storage, indexing, searching, and delivery of digital content, but might also eventually include:

- the creation of a library outreach program aimed at faculty, researchers, and students to:
  - identify and digitize non-born-digital research and academic output
  - advise and educate researchers about copyright issues and content licensing with respect to open access, digital repositories, and the traditional publication process
  - assist with content submission and metadata creation for items deposited with the repository
  
- the development of a digital space where Loyola faculty, researchers, and students can:
  - create a permanent online profile for their scholarly work and get information on how their works are being used
  - create notifications when new work has been published
  - access tools to aid in collaborative work and preparation for publication

The repository will seek to collect a broad spectrum of content, including *research materials* such as journal articles (either final versions or pre-prints), conference papers, gray literature, working papers, technical reports, presentations, dissertations, and theses; *pedagogical materials* including syllabi, slides, recorded lectures, exams, and handouts; and digitized *primary source materials* such as photographs, images, rare books, archival documents (correspondence, reports, etc.), oral histories, and recorded lectures, presentations, and other events.

Content may be self-submitted by faculty, staff, and other authorized users, and library faculty liaisons will also work with researchers directly to identify, digitize where necessary, and submit items for inclusion into the collection. Authors will retain copyright over any work submitted—access will be granted via a non-exclusive license which gives the university the right to disseminate the work via the repository's online public interface. Once ingested, documents will be associated with structured metadata records to describe the provenance and semantic nature of the content, which will support both access and preservation. Items will be organized by author, title, subject keywords, or departmental affiliation, but more importantly, the metadata structure will allow the content to be indexed more effectively by web search engines (e.g. Google) as well as exposed to indexes and aggregators of digital content using OAI-PMH.<sup>8</sup>

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<sup>8</sup> The Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) is a data interoperability standard for digital repositories. It allows web services to query and index repository records so that they can be added to discovery tools such as WorldCat. For more, see <http://www.openarchives.org/pmh/>.

The project will be aided by the establishment of an advisory committee of faculty, administrators, and librarians to inform the development and deployment of the repository and provide a forum for discussion of the varied publishing practices and scholarly communication issues facing academic departments within the university.

In summary, the digital repository is best envisioned not merely as a piece of software, or an archive, or a web site, but as a suite of services, software, and tools for the purpose of collecting, storing, organizing, and providing access to digital assets produced by the university community. These initiatives and systems will work in concert to facilitate a wide range of scholarly and archival activities, from content creation to collaboration, resource sharing to author rights management, digitization to preservation, and from publication to utilization by a global academic audience.

### **Desired Outcomes**

The Digital Repository Project has the potential to increase the value of the university's collections, enhance the library's role in the research practices of the university, provide a platform for online collaboration and information exchange, and address key information needs of students, faculty, and researchers both within the university and beyond.

Envisioned benefits include:

- *Increased discoverability, visibility and access of scholarship created by the Loyola community.* Objects in the repository will be more visible to search engines than if they were hosted on departmental websites or kept behind closed publisher-maintained gateways, and many objects will be available online for the first time. This will result in more information seekers finding and using Loyola-originated material in their research, increasing the university's visibility and standing in the academic community. The repository could also potentially provide a means to track faculty publications for administrative purposes.
- *Preservation of research output.* The repository will provide a permanent home for research material, and objects will have a persistent URL that will not change over time (unlike departmental websites). The repository will adhere to established best practices for storage and file management, and will be administered by information professionals, providing vastly improved prospects for long-term preservation.
- *Growth of digital content collections.* While the library currently offers access to countless text, image, audio, and video objects, the majority of these items are hosted by publishers and are not "owned" by the university in a traditional sense. The repository will create a collection of library-managed digital objects that can be organized, indexed, and presented in unique ways not possible

with publisher-controlled material. These collections will further establish the university's online presence and distinguish the library's identity within the academy.

- *Deeper integration of the library and librarians into the scholarly communications process.* The repository will not merely serve as a static archive of deposited material, but will consist of a set of services and personnel that could help guide the researcher throughout the publication process, including assistance with intellectual property management, digitization, abstracting, metadata creation, submission, and feedback on usage. Interaction with the repository's systems and services provides a valuable opportunity to educate faculty and students about open access and scholarly communications issues, which contributes to the reform of publication practices necessary to ensure a well-educated, information-literate society.
- *A robust platform for networked collaboration between researchers.* The repository system will provide a space for users to create their own personal online profiles to showcase their research material. These spaces will facilitate collaboration and document sharing between researchers across the academy, and users will be able to subscribe to a notification feed when new material has been posted to an individual, departmental, or disciplinary-specific profile, helping them keep abreast of current research.
- *Re-use and re-purposing of knowledge, data, and objects.* The proliferation of quality scholarly information and cultural heritage materials in digital form will serve as part of the foundation for developments in digital humanities, e-science, and cyberinfrastructure ("data and storage, computation, communication, visualization, networking, scientific instruments, expertise"<sup>9</sup>). The availability of academic material in an open-access, harvestable, structured format exposes connections between research, learning, and cultural materials, allowing new lines of inquiry and exploration in the humanities and sciences.

## **Challenges**

Challenges to a successful repository implementation abound. The implementation and ongoing maintenance and collection development activities require a significant investment of time, staff, funds, and technological resources; acquiring a critical mass of content can be difficult, given that faculty and administrators may not immediately perceive the benefits of submitting material to a repository; thorny copyright and intellectual property issues must be successfully navigated; acquired content may require substantial processing in order to prepare it for inclusion in the collection; and the health and long-term viability of digital information must be carefully monitored.

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<sup>9</sup> Greer, Christopher. "A Vision for the Digital Data Universe" (2007). <http://nanohub.org/resources/2291>.



Managing the responsibilities, needs, and expectations of such a wide array of stakeholders—to say nothing of shepherding an undertaking of this scope—requires diplomacy, organization, and excellent communication practices across departments, in addition to an understanding of, and respect for, the diverse research and publication practices of various disciplines. The mission, goals, outcomes, timetable, phases, activities, milestones, and deliverables of the project must be clearly articulated, documented, and executed to ensure that the repository performs its needed role. However, with proper planning, the digital repository has the capability of fulfilling its stated goals of providing access to a wealth of content that might otherwise be inaccessible, making our institution's academic output much more visible to the public, and integrating all units of the university more deeply into the campus knowledge-production life-cycle.

Bringing a repository to fruition involves the collective effort and investment of a diverse array of institutional personnel, including librarians, administrators, faculty, and staff. A distributed model of participation (or even better, funding) makes it all the more likely that the entire campus will become deeply invested in the repository project and more willing to work towards its success.

## **Conclusion**

The growth of open-access repositories at universities across the world represents a fundamental shift in the landscape of knowledge creation. The evolution of digital publishing technologies, networks, and data storage systems has placed the power for global dissemination of information within the hands of information producers themselves. No longer willing to serve as passive sponsors and consumers of knowledge, universities have embraced this revolution, using repository technology to meet their obligation to share the knowledge produced within their walls and preserve it for future generations.

When implemented properly, and with the cooperation of the entire campus, repositories have the ability to satisfy an extraordinary range of information needs. Repositories provide faculty with greater control, exposure, and security for all the varied intellectual creations they produce, as well a platform for collaboration and data sharing. They offer universities the ability to showcase the work of their constituents and demonstrate its value to the community, and a vehicle for managing and preserving it over the long term. And they provide libraries with a means to realize their full potential as partners within the scholarly communication process, curators of the knowledge produced by their patrons, and advocates for the democratization of information access.

As part of our core mission, the University Libraries strive to be “Loyola’s gateway to the world of information and scholarship.”<sup>10</sup> The proposed digital repository will indeed further this purpose, but it will also serve as the *world’s* gateway to the information and scholarship produced at Loyola University Chicago.

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<sup>10</sup> “Loyola University Chicago Libraries - Mission & Vision Statement,” n.d.  
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### Further Reading

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