EDUCATING LIBRARY, ARCHIVES, AND MUSEUM PROFESSIONALS IN THE US: PROMOTING COLLABORATION, RECOGNIZING THE POWER OF INFORMATION AND OBJECT IN PROFESSIONAL IDENTITY

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Abstract

Two digital curation educators, representing graduate schools of museum studies and information science at Johns Hopkins University and Simmons University, respectively, propose that the field of digital curation transcends disciplinary boundaries and offers opportunities for collaboration across the LAM sector. As students prepare to join the growing international digital curation community, these new professionals will be ready to communicate and cooperate with peers in libraries, archives and museums across the globe and across town. The result will be enhanced access to cultural heritage resources; greater efficiencies and economies of scale realized through wider data services; and improved service to users through the adoption of shared standards, protocols, and professional training—while at the same time maintaining the unique perspectives of each profession. Placement data shows that these graduates are finding jobs across the LAM spectrum, even in the time of Covid-19.

Introduction

As educators in the field of digital curation, our mission is to help new professionals build lasting careers in libraries, archives, and museums (LAMs) in an era of uncertainty and change. In the process of developing and updating our curricula, our natural focus has been on the practical strategies LAMs have adopted to meet the evolving needs of online audiences and to improve the management and sharing of digital information. The growing volume of digital assets in LAMs has led to new forms of collaboration, both formal and informal, spanning institutional and disciplinary boundaries. Within institutions, digital

workflows have led to new levels of cooperation across departments and specializations. Across institutions, new cooperative efforts have benefited LAMs through the development of common standards, services, and tools for managing digital assets. Elsewhere, we have examined the concept of digital curation as a distinctly collaborative practice that calls for actively managing information across the lifecycle, from the point of creation through steps taken to ensure long-term preservation. (Ray, 2009, 2017) Our aim here is to compare our respective approaches to teaching digital curation in the context of information science and museum studies, and, more broadly, to examine the role professional education plays in the ongoing transformation of LAMs. Students are often surprised to learn that there is a global community of digital curators from different disciplines and institutions working on the same problems. They are eager to learn more about the history of the different professions and how they have developed as they have. This awareness strengthens students' confidence in their own professional voices and encourages them to look for opportunities to collaborate. Ultimately, collaboration, as discussed in this chapter, promotes economies of scale and efficiencies in the sharing of expertise, infrastructure, standards, and resources that benefit both end-users and the institutions themselves.

From a historical perspective, the widespread adoption of digital curation systems and workflows in LAMs has brought about a revival of interest in the old idea of convergence between the branches of the LAM tree. This was a regular topic of debate as modern LAMs began to take root in the 19th century. Yet the idea had declined by the mid-20th century, as professional associations asserted their independence and newfound status as keepers of their own particular kinds of material objects. Even so, in the 21st century, as digital collections and services have become an increasing focus for collecting institutions, many have begun to explore again the potential benefits of an updated idea of convergence. (Marcum, 2014) Not surprisingly, we have seen little or no movement to date toward complete convergence as a "coming or drawing together" of institutions as the Oxford English Dictionary (OED) defines it. Yet the OED points to another usage of the term that is specific to technology, with convergence defined as "the

process by which originally distinct technologies may become more compatible or integrated as they develop," especially in ways that favor interoperability and standardization. (OED Online, 2020) In this context, some degree of technology-driven convergence, or integration, might well be expected, even as LAMs continue to value their specific identities. Although some digital advocates have gone so far as to speculate that physical repositories could be supplanted by online access systems as the preferred way to experience LAM collections--especially as such tools would enable users to view multiple object types at the same time and examine them in particular detail (Rayward, 1998)--current trends point to the need for greater emphasis on interoperability and standardization in the management of digital assets while maintaining the distinctive authority of professional domains.

As we explain below, the issues surrounding convergence have a direct relevance for LAM education. On the surface, the continued separation of LAM professional associations, publications, and degree programs poses a conundrum for educators as well as students, who are keenly aware of the many ways that technology is reshaping society, institutions, and human behavior. In helping to chart a future course for the LAM professions, we believe that educators can play a positive role in advancing collaboration across disciplinary and institutional boundaries. We believe this goal can be achieved without compromising the historical uniqueness and societal roles of libraries, archives, and museums as distinct voices, even as we seek to foster a culture of experimentation with and adoption of digital technologies and services across the LAM sector. Our aim is to develop a global cohort of professionals who can operate effectively within the traditional LAM fields, but who also identify as digital stewards with a common mission to utilize technology to reach new, global audiences, to enable new kinds of research and experiences while at the same time adopting accepted standards, and ultimately enhancing the value of digital assets for users.

We discuss three aspects of digital curation that are reshaping the work of LAM organizations, even as material collections have remained at the center of institutional missions:

- Digitization, the creation of digitized images to represent material objects online. Today, we can find many examples of LAMs, both large and small, have digitized substantial portions of their physical collections. As a result, they have had to implement new workflows and tools to manage digital assets at scale, as well as strategies for preserving and discovering digital content over time.

- Born-digital content, ranging from institutional repositories, created by academic libraries to manage the scholarly output of their institutions; to digital content accumulated by archives, beginning with magnetic tapes in the mid-20th century; and the acquisition by museums of varied products from digital media art to scientific research data. With the shift of information technology for content creation from physical to digital, it has become imperative for LAMs to develop capacity for managing digital assets of many kinds and to keep pace with new formats and technologies as they emerge and become mainstream.

- Collection documentation, which is increasingly managed in digital formats. This has been an essential development, enabling LAMs to make their collections discoverable by exposing metadata online, integrating their digital resources with those of other collecting institutions in aggregations to increase public access, and publishing content as Linked Open Data to open more widely not just collections and documents but the information within them. This development has impacted traditional professional roles, such as museum registrar and collection manager, in addition to introducing new positions such as digital asset manager.

Seeing these trends, educators face pressure to ensure that students have the flexibility needed for successful career paths.

Managing Digital Objects

A critical factor driving change has been the steady accumulation of digital assets, both in the form of digitized images representing material objects, and in the wide range of born-digital objects now being created and acquired by LAMs. In the 1990s, the digitization of library, archives, and museum holdings began through a variety of small-scale projects, many of which were carried out by research libraries with the goal of expanding access to special collections judged to be of high interest but too fragile for regular handling. After 2004, this "boutique" approach was overtaken in dramatic fashion by the Google Book Search Library Project. (Proskine, 2006) Through agreements with a number of major university research libraries, Google sent digitization teams into libraries to scan millions of books, providing online access to works known to be out of copyright, as well as "snippet" views of works still under copyright or with unknown copyright status. Lawsuits by publishers and authors were ultimately settled in favor of Google in 2016, when the Supreme Court declined to hear a final appeal by the Authors Guild. This resolution established that the scale and scope of the Google Book Project was "transformative" in nature, thereby meeting the requirements of United States (U.S.) copyright law for allowable use, and that it did not harm authors, who might in fact benefit from having their works better known.

Even while the legal cases were working their way through the courts, Google's digitization initiative opened the floodgates to mass digitization, not only of books but also of manuscripts, archival materials, and museum collections with their associated documentation. In fact, there turned out to be an online audience for just about anything and everything, as famously described by Chris Anderson in "The Long Tail," published by Wired magazine in 2004. (Anderson) Many statewide digital library projects, developed with content from libraries, archives, and museums, began during this period with funding from the U.S. Institute of Museum and Library Services (IMLS), and many of these aggregations continue today at the state level and nationally through the Digital Public Library of America (DPLA). DPLA was

modeled on Europeana, the EU-supported digital aggregation created in response to the Google Book Project out of alarm in Europe that the Internet would be dominated by English-language content. While the mass digitization of 20th century books has resulted in limited public access due to copyright issues, the digitization of archives and manuscript collections has been a major success in democratizing access to rare and unique materials that were previously accessible only to scholars working onsite. With online access, new and often unforeseen demand has appeared for primary source materials. Librarians provided needed rigor in developing standards and routine methods for managing and preserving digital assets. Archival principles developed for managing digital objects in repositories proved readily adaptable to other digital content (e.g., the Open Archival Information System reference model), with the result that archivists have played an important role in the development of digital workflows and archival repositories. (Thibodeau, 2007)

With libraries in particular acting as early adopters, museums were often "late to the party" to digitize. While some major museums undertook early digitization projects, many museums have been hindered by a scarcity of resources, including a lack of technology skills. Museums have also had legitimate concerns about displaying images of objects online with minimal contextual information, and by broader concerns that digitized images can never provide the authentic, emotional connections people make with original physical objects. (Mintz, 1998) Issues around copyright have also hindered digitization efforts, along with concerns that online access might reduce the number of in-person, paying visitors. Potential loss of revenue from free access to digital content is less of a worry for libraries and archives, which typically exist within a governmental or academic structure that provides some level of financial support. By contrast, most museums depend on admission fees, private donations, internal sales through gift shops and bookstores, and a myriad of other efforts to generate revenue. The Covid-19 pandemic has thus created a seemingly insurmountable challenge, with museums losing revenue due to closures and at the same time trying to increase their digital presence to stay relevant and to meet burgeoning demand for online content.

Despite these challenges, museums have been moving towards a digital tipping point, as institutions have come to see the value of having a robust online presence, enabling them to add their authoritative voice to online culture. (Verwayen et al., 2011) At a practical level, museums have found that, rather than discouraging visitors, publishing collection images online actually attracts more in-person visits as people discover objects online that they want to see in person as authentic objects. Today, many museums have digitized extensive portions of their collections, and most offer some degree of no-cost access to digitized images, at least to low-resolution thumbnails. Experience has shown that seeing objects in a museum gallery and seeing images on a screen are two different yet complementary experiences. (Schweibenz, 2012) At the same time, this means that LAMs now face the cost of maintaining both physical and digital collections. Without new sources of revenue, how can this challenge be met? We believe that cooperative efforts among LAMs, based on affinity of content, geography, expertise, and other factors, offer opportunities for resource sharing that may help to reduce costs, reduce the need for new investments by smaller institutions, and at the same time enhance services to users.

Managing Digital Information: Born-Digital Content

The creation of digitized images represents an extension, but not a redefinition, of museums' traditional role as keepers of material objects. Increasingly, however, institutions are acquiring and/or creating born-digital objects for which they have taken a long-term preservation responsibility. Contemporary art museums collect the works of artists working in digital media, raising complex issues regarding the exhibition and preservation of objects whose functionality may depend on particular technologies. Exhibition catalogs are produced as digital files, even though they are typically sold in limited print editions. Large natural history and other science-oriented museums employ scientists who conduct research and produce unique datasets in such fields as archaeology, astronomy, biology, botany,

chemistry, environmental science and zoology, in addition to research in conservation and materials science. These museums are now expected to publish their research findings and, increasingly, to share and preserve the data underpinning the research. (Smithsonian, 2015)

Libraries produce digital content in the form of guides, blogs, and other resources to inform and assist users, and they acquire and manage digital content through institutional repositories and other databases. Archives, meanwhile, acquire and manage an ever-increasing volume of born-digital files in many (often quickly outdated) formats, and LAMs of all kinds create digital content as part of their institutional activities, such as videographies to record public lectures and interviews with notable figures and eye-witnesses to historical events. All of these digital products must be preserved and made accessible for current and future use.

Managing Digital Information: Collection Documentation

Technology has also enabled collecting institutions to document and manage information about their collections, both physical and digital, in collection management systems. As LAMs have come to depend on databases to support their internal collection management functions, these systems have also enabled sharing of documentation externally. Efforts to expand the sharing of bibliographic metadata dates back at least to the 1980s, with the publication on magnetic tape of the Library of Congress Subject Headings' Subject Authorities Database. This database replaced printed cards that had previously been distributed to libraries that followed LOC's cataloging standards. (Stone, 2000) Earlier work in developing cataloging standards, such as MARC (Machine Readable Cataloging) and AACR (Anglo-American Cataloging Rules), facilitated metadata sharing. The fact that many libraries owned copies of the same book meant that only one had to catalog it if the others could make use of the same information. The presence of well-tested standards enabled libraries to reduce costs, clear backlogs, and serve users better with accurate, up-to-date and authoritative cataloging practices.

Archives and museums initially had fewer incentives to standardize and share documentation, as they have long emphasized the uniqueness of their collections—putting aside the extent to which archival records and museum objects might be parts of or related to collections held elsewhere. (Botticelli, 2016) By focusing on objects over information, museums have tended to document their collections in a way that may be thorough yet lacking the uniformity needed to search across repositories and even within a single institution. Museum catalogs, for example, might have records for an individual artist with the name entered in different ways for different works. Such inconsistencies did not pose serious problems when documentation was exclusively in paper form, but as museums made the transition to digital collection management systems, they quickly began to see the value of standardized approaches, as reflected in the Getty Research Institute's development of the Art and Architecture Thesaurus beginning in the late 1970s, followed by other controlled vocabularies such as the Union List of Artist Names, the Getty Thesaurus of Geographic Names, and the Cultural Objects Name Authority. (Getty, n.d.) As museums began to rely on these tools to catalog their holdings, descriptive practices have become more uniform. The worldwide adoption of consistent descriptive methods has paralleled the rapid growth of digitization efforts, driven by the demands of users for ever more online information.

Virtually all LAM's in the developed world now maintain cataloging records and other collection documentation in digital form. Particularly for museums, documentation plays a critical role in managing objects, which often contain little or no contextual information embedded within the object itself (with exceptions such as an artist's signature on a painting, which even then requires authentication to ensure it is not a forgery). Provenance information comes mostly from external sources and is an essential part of establishing the significance and context of museum objects; research is often required to reveal their history. Provenance has now come to encompass information not only about individual objects and owners but also about associated persons, social groups, cultures, and historical periods. Documentation

is therefore essential to the objects themselves, since without it their meaning will remain obscure or unknown.

When published as Linked Open Data, this information is discoverable online as distinct pieces of information, such as dates and events linked to names of persons, places, or ideas. Linked with information from other collections, data sharing can enable discovery of relationships between varied types of objects, sites, textual materials, and so on, regardless of where they are physically located. This has the potential to accelerate search and discovery not only across cultural heritage collections but also to increase access to scientific information, such as environmental data and documentation on the evolution of species.

With increased standardization, it became possible to integrate metadata into aggregations combining the rich resources of libraries, archives, and museums. The development of the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) in 2001 was a game-changer in allowing online users to search in real time across many collections in one aggregation. (Lagoze & Van de Sompel, 2001) IMLS began funding research and demonstration projects utilizing the OAI Protocol in the early 2000s to bring together in a single aggregation digital content produced by libraries, archives, and museums with IMLS digitization grants by harvesting metadata from these grantees. IMLS funding also supported the development of statewide digital libraries, often under the leadership of a State library or university library that had the infrastructure and expertise to implement the OAI-PMH Protocol and store the resulting aggregation of metadata. Many of these statewide digital aggregations continue today, and a number have become regional hubs feeding metadata to the Digital Public Library of America. A few, such as the California Digital Library's Calisphere and Massachusetts's Digital Commonwealth, provide additional services to contributors including digitization, training, and preservation of digital objects. Through these kinds of initiatives, LAMs have discovered that there is much to gain by treating all types of cultural heritage documentation as dynamic and current sources of information, as librarians have

understood the term, rather than viewing documentation as a static, hard-to-access body of records that might or might not be made available to external users.

If we see all LAMs as information centers, there is clear value in developing and implementing standards for managing and sharing collection data. Such standards must be cross-disciplinary, adopted not only across all types of collecting institutions but also by research communities, including digital humanities scholars and research scientists. This is an area where library and information science professionals are well equipped to provide infrastructure and expertise, including knowledge of intellectual property laws as well as technology standards and practices.

Professional Education for Digital-era LAMs

Today, libraries, archives, and museums are actively creating, collecting, and sharing digital content including digitized images, born-digital content, and collection documentation through online repositories that aggregate information at multiple levels. As LAMs continue the digital transition, and especially as they discover the value of digital information resources, graduate degree programs have been actively working to prepare practitioners for the evolving digital environment in which their professional careers will be playing out. A key trend in LAM education has been to seek points of collaboration or integration in our respective curricula for library and information science, archives management, and museum and heritage studies.

Here we focus on how the programs at our respective institutions, Johns Hopkins University (JHU) and Simmons University, have approached collaboration as an organizing principle in teaching digital curation.

The proliferation of graduate digital curation programs was kick-started by IMLS, which in 2006 called for grant proposals to create digital curation programs in schools of library and information science. This was made possible by new funding designated by Congress as the Laura Bush 21st Century Librarians program. With this initial funding, new, innovative digital curation programs were created at the University of Arizona, the University of Illinois at Urbana-Champaign, and the University of North Carolina at Chapel Hill, and numerous other information schools in the following years. (Manjarraz et al., 2010) Today, these schools of library and information science continue to offer certificates and degree tracks in digital curation (sometimes under different names) alongside their masters' degree programs. The Simmons University School of Library and Information Science, with its historical interest in archives and cultural heritage, is one such program.

Simmons University School of Library and Information Science

Simmons University offers an MS in Library and Information Science with concentrations in Archives Management, Cultural Heritage Informatics (CHI), and Information Science and Technology (IST). As one of the oldest and largest library science programs in the U.S., Simmons has long been identified as a "library" degree, as accredited by the American Library Association. However, the archives concentration has grown dramatically since its establishment in the 1990s, to the extent that students focusing on archives now account for roughly half of the school's total enrollment. Archives students also have the option of pursuing a dual master's degree in History and Archives Management. As a program that is more or less evenly divided between the "L" and the "A" branches of the LAM tree, the curriculum clearly reflects the duality of "object" and "information," as students learn to manage collections both for their intrinsic value—as unique archival records—and as information sources that must meet the current needs of users. In this context, the newer CHI and IST concentrations enable students to further develop their capacity to work with collections, especially in digital form, and the communities they serve.

The Cultural Heritage Informatics concentration, launched in 2015, was designed to be explicitly interdisciplinary, striking a balance between library, archives, and museum-related course offerings. Students complete the three mainly library-focused courses that are required for all Simmons students:

- Information Organization
- Information Sources and Services
- Technology for Information Professionals

CHI students also complete two introductory courses: the "Concepts" course that provides an interdisciplinary view of how LAMs have evolved over time, and the foundation course for the Archives Management concentration. In addition, CHI requires a suite of courses related to preservation and digital curation. The full menu of CHI requirements includes:

- Concepts in Cultural Heritage Informatics
- Introduction to Archival Theory and Practice
- Preservation Management in Libraries and Archives
- Digital Stewardship
- Digital Asset Management for Libraries, Archives and Museums

To further balance the curriculum between the LAM branches, a new Museum Studies course is being introduced in 2020, which is expected to become integral to the concentration.

Johns Hopkins University Museum and Heritage Studies

IMLS funds under the Laura Bush 21st Century Librarians program were restricted to schools of library and information science, so museum studies programs could not apply, and IMLS's limited funding for museum professional education was generally limited to professional development rather than formal

degree programs. Nevertheless, Johns Hopkins University's Museum Studies program—the largest museum studies graduate program in the U.S.--located in the University's Krieger School of Arts and Sciences (KSAS) Advanced Academic Programs (AAP)--initiated a new graduate certificate in digital curation in 2014. It is modeled on the digital curation programs already in existence in schools of library and information science but tailored to the needs of museums. A dual credential (MA in Museum Studies and Graduate Certificate in Digital Curation) was approved in 2016, followed by an MA in Cultural Heritage Management (KSAS/AAP) and Graduate Certificate in Digital Curation in 2018. The course syllabi for the Simmons CHI concentration and the JHU digital curation certificate reveal substantial similarities. Courses in the JHU digital curation curriculum include:

- Digital Preservation
- Foundations of Digital Curation
- Managing Digital Information in Museums and Archives
- Elective chosen from the museum studies curriculum (typically Collection Management for museum studies and Cultural Heritage in the Digital Age for cultural heritage)
- Digital Curation Internship
- Digital Curation Research Paper

Comparing the Simmons and JHU curricula shows that their respective approaches to digital curation have distinct commonalities. Both programs emphasize documentation of digital objects as information resources. We view collection documentation as first-class digital objects in their own right; that is, as objects worthy of long-term preservation, as opposed to mere pointers to the permanent collection. We emphasize the need to invest in online access, enabling institutions to tailor their online presence to serve users effectively as they search collection databases for their informational value, and ultimately discover and understand the context of both material and digital objects. Our respective digital curation curricula

fit well within the DigCurV Curriculum Framework, developed with EU support, which defines the requirements for digital curation education from the perspective of three lenses—Executive, Managerial, and Practitioner, with inter-related competencies including strategic thinking, higher-level planning, internal and external liaisons, and planning and implementation of tasks relating to digital curation in general and to specific areas of cultural heritage. (Molloy et al., 2014)

Our experiences teaching in programs dedicated to museum studies and to library and information science reinforce our belief in the need for interdisciplinary approaches to professional education for digital curation in particular, as it relates to the cultural heritage professions in general, including libraries, archives, heritage studies, and museums. (Ray, 2009) This principle is illustrated in the museum sector, where collection documentation has expanded from creation and ownership history to include information such as condition, conservation treatments, exhibition, loans, and other significant object-related actions that span the whole range of museum activities. There are similar distinctions relating to documentation of library special collections and archives. This additional specialized information only adds to the context and discoverability of like information objects regardless of the material forms of originals or where they are housed. At the same time, recent scholarship has called attention to problems arising from professional specialization, particularly with regard to the development of museum archives in the 20th century that consolidated some documentation relating to museum collections and objects in a single "archives" department. This separation from the collections themselves and their associated cataloging has often led to the fragmentation of documentation among different databases as museums automated their physical documentation files without integrating them, resulting in loss of context about objects, collections, and people associated with them. Awareness of this lost context calls for increased collaboration across internal departments within museums as well as collaboration across institutions and sectors. (Jones, 2018)

The museum studies MA program at JHU offers electives for students wishing to pursue concentrations in archival practice and related specializations that have the potential to reconfigure the management of museum archives, such as:

- Introduction to Archives
- Collection Management Systems
- Provenance Research: Connecting Histories
- Preservation of Analog and Digital Photographs
- Web Archiving (in development)

Beyond the technical and information management issues that lie at the core of digital curation, there continue to be important variations in the curricula of library and information science programs and museum and heritage studies that reflect different disciplinary perspectives. Examining the whole curricula in the Simmons and Johns Hopkins programs, we see clear points of divergence. In contrast to the Simmons focus on information, for example, the Museum Studies master's program at Johns Hopkins emphasizes the centrality of "the object," with such courses as

- Introduction to Museum Education
- Collection Management
- Exhibition Strategies
- Material Culture
- Curatorship: Principles and Practices
- Curating Online Exhibitions and Experiences
- Private Collections

Likewise, the JHU MA in Cultural Heritage Management is largely site-specific, focusing in particular on the landscape, the built environment, traditional knowledge, and related artifacts of cultural heritage sites. Courses include:

- Studies in World Heritage
- Reading the Landscape: Cultural Heritage at Scale
- Heritage Interpretation
- Cultural Heritage in the Digital Age
- Cultural Heritage Resource Management
- Heritage Tourism

Through all of these areas of emphasis—from library and information science to archival science to museum and heritage studies—the perspective that digital curation adds can be seen as a cross-cutting specialization in which common principles, standards, vocabularies, tools, and services can be tailored to the specific types of physical materials with which each discipline is engaged, but which in the digital realm all come down to "data." In this view, we believe that each of the LAM disciplines may benefit as educators help students gain a critical perspective on the varying technologies and methods used across the LAM tree. A key goal in both the JHU and Simmons program is to equip our graduates to have productive conversations with people representing different specializations. Ideally, our graduates will be prepared to work in diverse teams that will include technologists, user services specialists, knowledge managers, and curators of varying object types. How do we do this? Our answer is: by giving new professionals the vocabulary and skills to communicate across disciplines, by increasing awareness of what each profession brings to the body of human knowledge, and by instilling a desire to work across boundaries.

As one example of how such collaboration might work in practice, we cite a new initiative in the JHU master's program in Cultural Heritage Management: A course in digital heritage documentation will take students to a selected heritage site to learn about documentation technologies and visualization methods to create a comprehensive digital survey. Because personnel working at such sites typically lack technology tools and expertise, this initiative will provide a learning experience for both students and site

professionals. In addition to creating an accurate dimensional record of permanent value, it will also facilitate conversations among students, practitioners, and faculty to brainstorm ways in which the resulting documentation can be used, from conservation applications to public outreach through visualizations, simulations and other creative products. To ensure that this valuable dataset is preserved for future use, JHU Data Services, located in the University's Sheridan Libraries, will maintain an archival copy. Through this project, participants will learn from each other, and all will gain an understanding of the techniques, potential, and value of digital curation.

We have found that field experiences like this play an invaluable role in students' preparation for careers. In line with JHU's efforts to connect practitioners and students through the digital heritage documentation course, the JHU digital curation certificate program includes a required internship that places digital curation students in working relationships with expert practitioners. In addition, students take a culminating Digital Curation Research course in which they investigate a particular aspect of digital curation, often conducting interviews with current leaders as part of their research. Similarly, Simmons has designed a course in Digital Asset Management that serves as a capstone experience for students in Cultural Heritage Informatics. Students in the course prepare in-depth case studies showing how selected LAMs have tackled the challenges in designing digital workflows and in building the infrastructure needed to manage digital assets. Central to this experience are a series of research interviews with working professionals. In sum, all these experiences help students expand their professional networks and gain a deeper understanding of the wider LAM field, including current trends and institutional needs. Particularly with the challenges facing LAMs during the Covid-19 pandemic, it is noteworthy that graduates of our digital curation programs, combined with relevant masters' degrees in information science or museum studies, have found jobs as LAMs have focused on the need to provide more online resources and engage online audiences.

Future Directions

Our experience reveals genuine value in maintaining a diversity of perspectives in both library and information science and in museum and heritage studies programs. Despite differences, we believe that programs like ours are complementary, and that faculty as well as students in each of these areas of study benefit from the expertise and viewpoints of the others. As LAMs continue to engage with digital culture, we believe it will be increasingly important for institutions and professional communities to share ideas and to seek common solutions. It is possible to envision a point at which LAM collections of all kinds may be aligned or "converged," at least from the perspective of users as they discover and interpret objects through online access systems. At the same time, LAMs can and should be expected to uphold their disciplinary origins as they create, acquire and curate digital objects.

To act effectively as curators of objects and as providers of information, the LAM sector will need regular collaboration across disciplinary and professional lines. Degree programs like those at Simmons and Johns Hopkins can help to foster communication as we navigate through the uncertain and evolving terrain of digital curation. The conversation on "convergence" (or integration, collaboration, or cooperation) is likely to continue, and that's a good thing. The potential for greater interoperability and alignment of data collections is a goal worth pursuing. At the same time, the uniqueness of each profession and the reasons for its distinct expertise must be maintained to allow the authoritative voice of each community to be heard. This goal can be pursued through collaborative efforts to contribute to data aggregations, to develop and promote the adoption of broadly applicable standards and to respect those practices that are unique to specific conditions. There are also significant opportunities to develop shared preservation repositories, training programs, and thematic exhibitions and events at the local, regional, national and international levels, resulting in economic benefits and efficiencies for institutions and enhanced services to users.

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