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Arjun Sabharwal

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Functional Frameworks for Socialized Digital Curation: Curatorial Interventions and Curation Spaces in Archives and Libraries

Arjun Sabharwal

Abstract

Archives and libraries have expanded their curatorial capabilities with digital technologies and social media. Digital repositories, content management systems, and social media are part of a dual strategy for curating digital collections, combining the digital preservation of media and community participation in preserving community memory, cultural heritage, and thematic research collections. Socialized digital curation (SoDC) represents the convergence of digital and social curation approaches in a broader framework of relationships across the curation spaces (or functional frameworks) holding the pieces—curators, communities, collections, and technologies—together. Social purposing is evident as curators develop relationships with diverse communities. The cultural, generational, and professional diversity of archivist, librarian, and participant-curator (ALPC) communities further contributes to diversity in collection themes, choice of technologies, and knowledge organization preferences. The growth of digital content and collaborative activity on the Internet, however, has raised concerns about the discoverability of digital content in a fragmented Internet environment, necessitating three curatorial interventions—interlinking, knowledge organization, and documentation—to join disconnected and uninteroperable fragments. The conceptual framework presented in this study focuses on the interrelationships among curators, collections, technologies, and practices. There are no monolithic solutions to curatorial interventions and approaches to SoDC, as all archives and special collections are unique.

INTRODUCTION

Archives, libraries, and museums have survived since antiquity and re-formed through the periodic introductions of media, technologies, and curatorial practices. Access to technologies throughout their history has enabled these institutions to develop strategies for preservation, knowledge organization, and documentation. Digital technologies have enabled curators to explore new ground and approaches in content curation, allowing them to extend curatorial practices beyond their physical facilities and engage curator communities on the Internet. The present-day models of engagement and community participation represent an expansion of curation approaches through new methods of maintaining collections and cultivating new functional relationships in the digital environment. How socialized digital curation enriches digital preservation of cultural heritage content merits further study.

A socialized model for curating cultural heritage represents a new direction for curators. For present purposes, *socialized digital curation* (SoDC) is a designation implying the convergence of digital and social curation approaches in a dual strategy combining digital preservation with community participation. For archives and libraries, it means an extramural continuation of practice involving collaboration with various curator communities using digital repositories, content management systems (for website development), and social media. The cultural, generational, and professional diversity of these communities is compelling, considering their composition: curators at heritage institutions, scholars, students, teachers, community archivists, local historians, bloggers, and casual Internet users participating in the curation process. The present study designates the term "archivists, librarians, and participatory-curators" (ALPC) in reference to their collective diversity and scope. They contribute to participatory archives (see Poole 2019; Theimer 2011), digital thematic research collections (see Price 2009; Palmer 2004), collaborative virtual museums (Sabharwal 2013), personal digital archives (Lee 2011; Hawkins 2013), and countless other types of collections using a variety of technologies. Amid the excitement about the growth of digital content and collaborative activity online, however, curators have begun to raise concerns about the accessibility and interoperability contributing to the discoverability of digital content on the fragmented Internet (Hill 2012).[1] Concerns about the structural instability of digital media, software backward compatibility, and scarcity of hardware have necessitated three curatorial interventions (interlinking, knowledge organization, and documentation), incorporating SoDC to varying extents. A dual strategy in SoDC involves a response coordinating preservation concerns with collaborative approaches to curating cultural heritage, community memory, and scholarly knowledge.

This study focuses on SoDC within the functional frameworks of archives and libraries, particularly public and university libraries, with digital

collections. It aims to provide a better understanding of how SoDC contributes to the preservation of cultural heritage. Three questions drive the ensuing analysis: What is socialized digital curation? What are curation spaces, and how does socialized digital curation fit into those functional frameworks? How can socialized digital curation and curatorial interventions ensure the discoverability of communities and content in the fragmented Internet environment? The present study takes a framework approach, which informs the analysis of key roles and relationships behind a dual strategy for SoDC. It first presents a conceptual clarification of socialized digital curation through a brief review of definitions and related practices such as digital curation and social curation. Next, it focuses attention on the concept of the curation space (the functional framework) consisting of curators, collections, and technologies, and how SoDC fits into this framework.[2] Theories supporting this approach include Charles Kadushin's social networking theory (2004), George P. Landow's hypertext theory (2006), and the grounding work on information architecture by Louis Rosenfeld and Peter Morville (2002).

The study then discusses interlinking, knowledge organization, and documentation as curatorial interventions needed to enhance discoverability in a fragmented Internet. Two other frameworks have informed this study: the first one is the Digital Curation Centre's curation lifecycle model (Higgins 2008), which presents a comprehensive model with digital preservation and community participation interlocked in a cyclical framework. The other framework involves layers of representation at various levels (Lee 2012), which, for the present purposes, imply the need to curate digital content at various levels. While technical aspects of digital preservation and empirical approaches including quantitative analysis are critical aspects of cultural heritage curation work, they fall beyond the scope of this study and merit separate studies.

Socialized Digital Curation

The digital curation lifecycle model (Higgins 2008) presents a cyclical framework for digital curation with community watch and participation closely positioned with both preservation and curation. Although there is no explicit relationship between *socialized digital curation* and this model, community participation implies a socialized (or democratized) approach to digital curation. For purposes of semantic clarification, it is necessary to understand some relationships to related concepts. *Curation* is the "practice of managing historically valuable collections of artifacts" (Museum Curation Community n.d.). In archiving practice, *manuscript curation* means "appraising, acquiring, arranging, describing, preserving, and providing access to a collection of original documents" (Pearce-Moses 2016d). *Socialized* refers to "[adapting] to social needs or uses" ("Socialized" 2019); thus, *socialized curation* implies public engagement for various

causes in the present article. *Social curation* means "curating collections of digital objects found on the Web [through] practices like bookmarking, tagging, and downloading [as a] popular adoption of high-speed Internet and Web 2.0 technologies" (Zarro and Hall 2012). It is a highly collaborative and popular form of curation. *Digital curation* refers to "actions needed to maintain and utilise digital data and research results over their entire life-cycle for current and future generations of users" (JISC 2003, 1). It also implies the use of trustworthy digital repositories, sound preservation policies, metadata standards, open data formats, and documentation (Lee and Tibbo 2007).

SoDC spans both the social and technological dimensions of curatorial work, as it implies functional relationships among curator communities, collections, and technology across curation spaces. Curators engage audiences and other curators for human input and collaboration as they develop collections and exhibits, and choose specific technologies for collaboration and sharing. Curation strategies, in turn, necessitate or justify using selected technologies, which then enable curators develop collections as planned. These relationships are multidimensional. For present purposes, therefore, a working definition for *socialized digital curation* is that it is a socially oriented approach to curation involving digital preservation combined with community participation, social purposing, and scholarship. In this spirit, SoDC may extend to any curation project involving mainstream as well as marginalized communities, veterans, firefighters, and other self-defined groups. Projects may include supporting National History Day competitions and public humanities projects involving community archivists, volunteers, researchers, and others not falling into the categories of legacy archival curation work. Cook's chronology of archival frameworks (2013) has placed archivists into the community environment (fourth paradigm) as consultants and participants working with community historians, volunteers, and archivists. In fact, SoDC may well signal a paradigm past the fourth with archivists either sharing a leadership or consulting role or participating under the lead of community players. The various chapters on community archives (see Bastian and Flinn 2020) indicate that approaches to community archiving are as diverse as the communities themselves are. SoDC underscores the value of community-focused themes and activities around curating narratives, documentaries, pictorial histories, and other stories. It then presents that material in a context central to that community's identity, memory, and cultural heritage in addition to preserving them in physical and digital formats.

Curation Spaces and the Functional Framework

Curation spaces are functional frameworks—or, as Applehans, Globe, and Laugero (1999) call them, knowledge architectures—for joining curators, collections, and technologies in close working relationships.[3] As such, they

represent highly interwoven structures such as departments, teams, social networks, classification systems, and hypertextual connections across vital parts of the framework. In archives and libraries, these spaces include preservation labs, workspaces, galleries, and, in archives most importantly, conservation and climate-controlled storage facilities, designated workstations for digitization and digital preservation, and websites for managing access to digital content. Curation spaces are no longer limited to physical facilities, however, as they increasingly rely on hosted digital services such as ArchivesSpace, ArchiveGrid, LibGuides, digital repository platforms, and social media sites used by archivists and librarians. Such hybrid curation spaces have become the functional frameworks for SoDC for three reasons: first, it is in these spaces where ALPC communities interact and collaborate on socially purposed archives and projects; next, these spaces feature physical and digital collections communicating about social experiences and community memory; and finally, the use of shared technologies and outreach demonstrates the socialized application of technologies for purposes of curating cultural heritage, memory, and identity. Figure 1 presents a framework for these relationships where the connecting lines represent collaborative, semantic, and hypertextual relationships. No framework is monolithic, however, as there as many unique frameworks as there are institutions, collections, and relationships. The ensuing sections on curation spaces discuss how SoDC fits into the functional framework.

Archivists, Librarians, and Participant-Curator (ALPC) Communities
ALPC communities are the primary drivers of cultural heritage curation and SoDC, particularly in the digital environment. Archivists, librarians, museum curators, researchers, academic departments, educators, community volunteers, and others comprise this community. They utilize their curation spaces for interaction with the public and other ALPC communities, and for purposes of this study, it is important to separate two spheres (or dimensions) of curatorial influence: internal and external. In the former, curators leverage their physical spaces (e.g., exhibit areas, preservation facilities, and storage) and practices (e.g., appraisal, accession, preservation, conservation, provenance research, and localized outreach) for control over collections and relationship with patrons. However, as these institutions utilize the Internet to an increasingly greater extent, their curators' external spheres of influence also begin to extend to managing virtual spaces (e.g., websites, digital repositories, and social media) where they can leverage digital technologies to suit unique needs, thus extending visitor access to physical and virtual spaces alike. As illustrated by Brooklyn Museums' successes with crowd-curated exhibitions (Steinhauser 2012), curator communities and the public can explore both the physical and virtual domains within these curation spaces.
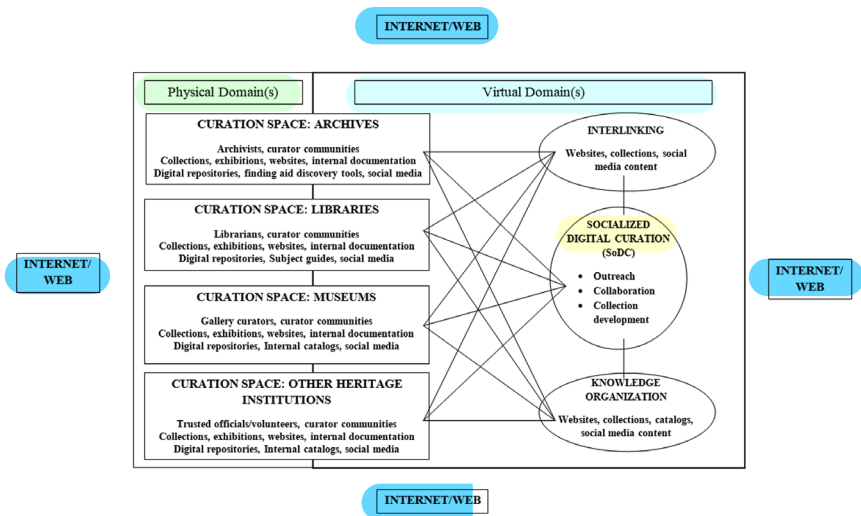
Figure 1. A functional framework for SoDC

Cultural, generational, professional, and socioeconomic diversity in ALPC communities is vital to shaping and informing collection themes, technology choices, and curatorial interventions because they share unique identities and perspectives with their audiences. In techno-generational terms, they constitute two recognizable groups based on experience with digital technology: there are the digital natives who are the "native speakers" in the new environment, and there are the digital immigrants who are adapting to this environment (Prensky 2001). Naylor and Looker (2010, 61) have addressed "digital diversity [with respect to] the likelihood that individuals adapt technology use [with] differences in life circumstances such as cultural, socio-economic, and cognitive resources." While natives outside archivist and librarian professional circles may be less familiar with professional curation practices, they are fluent with social media, which is vital to SoDC. Archivists and librarians experienced with predigital formats are largely digital immigrants in the same sense but are rapidly adapting to the digital environment (see Pastore 2009). SoDC, therefore, assumes considerable flexibility in collaborating and communicating among diverse participants. Digital outreach efforts of public libraries throughout the United States to reach communities across the digital divide (Whitechair 2016) have been valuable. The distinction between digital natives and immigrants, however, is evaporating as senior professionals retire (or adapt) and younger ones gain experience with predigital collections. However, there remain other types of digital divides along microcultural (ethnic, racial, linguistic, and cultural) lines.

The rise of community archives in marginalized and ethnically diverse communities (see Bastian and Flinn 2020) and personal digital archives (see Hawkins 2013; Lee 2011; National Digital Information Infrastructure and Preservation Program 2013) attests to the importance of diversity in this evolving curation space. The increasing overall diversity in the archives and library profession also demonstrates the direction in which the profession is heading on an international scale (see UNESCO n.d.). These are critical trends for the purposes of this study because cultural perspectives and insights are significantly shaping digital collections, technology choices, and curatorial interventions, which are also discussed in this study. There are countless eminent examples of curation projects illustrating cultural diversity. The African American Oral History Project (University of Louisville Libraries n.d.) is an initiative of the University of Louisville Libraries Digital Collections, featuring the institution's oral history collections in their Oral History Center. The Library of Congress Digital Collections site (https://www.loc.gov/collections/) provides access by subjects, featuring ethnic, tribal, and regional communities, such as the Curtis (Edward S.) Collection, which contains Native Americans through historic photographs. La Maison D'Haiti (Mhaiti.org 2012; see also Rochat et al. 2020) was a community-driven collaborative archive project by Haitians in Canada focusing on the Haitian diaspora in Quebec, Canada. The Archive of Immigrant Voices (Center for Global Migration Studies n.d.) site presents another example of a community-based project organized by the Center for the History of the New America with recordings of oral history interviews in migrant communities. Dalitcamera.com is about the Dalit community experience in India, featuring YouTube recordings of Dalit perspectives and social experiences. Sheffield (2020) identifies two other projects, the Digital Transgender Archives and the Archives of Lesbian Oral Testimony, as born-digital material, which illustrates how generational diversity shapes technology and media choice among digital natives.

Digital Collections

Digital collections have become important access points to special collections in archives and libraries as more people use search engines and mobile technologies to locate or discover information on the Internet (see Warren-Jones 2018). Prior to the emergence of computing and digital media, archival curation had focused on preserving paper-based organizational records, manuscript collections, rare monographs, and audiovisual media in physical and analog formats. The access points for these collections were print finding aids prepared at the time of processing, that is, arranging, describing, labeling, and boxing the collections. The finding aids in PDF format have gradually been replaced by EAD-based digital finding aids created in Archivist Toolkit, ArchivesSpace, and online

finding aid repositories (e.g., OhioLINK Finding Aid Repository, Texas Archival Resources Online, Archives of Michigan Online Finding Aids) as digital access points. Bibliographical records in library catalogs have also become similar access points. Elsewhere, the National Archives has extended digital access to the Declaration of Independence, Constitution, and the Bill of Rights via its interactive catalog on the America's Founding Documents website (NARA n.d.). Massive volumes of manuscript collections, organizational and personal archives, rare books, and artifacts have since been digitally reformatted. This trend has affected approaches to collection description, metadata practices, and policies (Smith-Yoshimura 2017) with implications for curators devising curatorial interventions related to metadata and social ontologies. Cultural diversity in the collections represents the experiences and perspectives of communities and the curators developing those collections and underscores the role of SoDC in collection building. The Palestinian Oral History Archive, Archive of Immigrant Voices, and Digital Transgender Archive at the College of the Holy Cross all illustrate the value of SoDC and the results of social interaction, community participation, and collaboration.

Not all digital technologies are accessible to all curator communities, however. Those operating independently or as part of community archives are using social media as access points to important collections, some with social purposing in mind with others out of personal or professional interest. These attempts demonstrate the effects of SoDC (with community participation) of collections and projects. The Facebook page of the San Antonio African American Community Archive & Museum (founded in 2017) may be considered an SoDC project focusing on the African American social experience and local history through posts, images, videos, and discussions. The theme of human and civil rights is also present in the Facebook page of the Western Pennsylvania Disability History and Action Consortium (founded in 2016). In both cases demonstrating social purposing, the sharing of photos and community historical information is central to SoDC.

Archives and Digital Archives

The digital transition has introduced a few semantic changes to the meaning of the term *archives* and *digital archives* (Theimer 2012). The former means "[materials] created or received by a person, family, or organization, public or private, in the conduct of their affairs and preserved because of the enduring value contained in the information they contain or as evidence of the functions and responsibilities of their creator, especially those materials maintained using the principles of provenance, original order, and collective control" (Pearce-Moses 2016a). Theimer lists the four principles in archival practice: arrangement by provenance (or *respect des fonds*), which is the history of the record custody; collective control, involv-

ing description and arrangement (guided by provenance); the concept of original order to preserve the original context of records; and intrinsic value of surviving unique artifacts (Theimer 2012). These four principles, however, no longer drive curation practices on the Internet where the digitization effort has thus far focused on providing access to digital surrogates. *Digital archiving*, in contrast, refers to "the long-term storage, preservation and access to information that is 'born digital' (created and disseminated primarily in electronic form) or for which the digital version is considered to be the primary archive" (Hodge 2000). The two concepts have placed different emphases on the values of specific archival practices, which, as will be seen in the ensuing discussions, affect choices of technology and curatorial interventions. The changing semantics related to how society views archives illustrate how SoDC has shaped the curation spaces through the introduction of *digital archives.*

The scholarly focus of digital collections represents a small segment of the ALPC communities. New types of collections such as *digital archives* and *digital thematic research collections* (Price 2009) have emerged since 2000 to serve the scholarly needs of Internet users with varying digital literacies. Palmer (2004, 351) has described *thematic research collections* as "open-ended [with] the potential to grow and change depending on commitment of resources from collectors . . . 'born digital' and transcribed documents." In their roles as participant-curators, humanities scholars have contributed to the expanded meaning of archives to include collections for scholarly uses. The Mandela Archives, for instance, is "an example of an institutionalized personal public archive that challenges conventional configurations of the archive, the power structures that they embody, and the boundaries we have drawn around the forms that archives might take between personal and public recordkeeping" (Lee 2011, 135). Elsewhere, the curation of text-encoded works using TEI-XML encoding clearly illustrates the scholarly and hermeneutic purposes of such digital thematic research collections as the Walt Whitman Archive (Folsom and Price n.d.). Finally, Cahoy (2013) has addressed the trend of faculty in academic archiving, but in that context, faculty members were contributing to the institutional repository with previously published work or drafts of scholarship in progress. These approaches illustrate that professional diversity among participant-curators significantly shapes digital collections. Hence, the emergence and subsequent growth of born-digital content has added a new type of digital collection to the curation spaces of archives and academic libraries.

Virtual Museums and Exhibitions

The thematic presentation of digital content as seen in virtual museums and exhibitions signals a different approach to SoDC. A *virtual museum* is "a digital entity that draws on the characteristics of a museum [and] can

perform as the digital footprint of a physical museum, or can act independently" (V-MusT 2017). It is also "an information system containing a conceptually unified electronic collection or set of collections of objects (items) with metadata . . . which facilitates research, education and discovery activities in the virtual space" (Povroznik 2018). While *virtual museum* suggests the extension of a physical museum's curation space to provide access to collections and exhibitions, physical museums are not the only institutions developing virtual museums. Examples of crossover practices include the Canadian Museum of History and its Virtual Museum of New France, the Fiji Museum's Virtual Museum, the Museum of Flight's Virtual Museum Online, the Smithsonian Latino Center's Smithsonian Latino Virtual Museum (a research center at the institution), the Institute of Navigation's ION Virtual Museum, the Michigan Shipwreck Research Association's MSRA Virtual Museum, and the Georgia State Bar's Virtual Museum of Law, providing digital access to historical documentation related to historic trials, civil rights, and cruel and unusual punishment. Collaborations of multitype organizations have also resulted in virtual museums, as is the case with Toledo's Attic (Sabharwal 2012a) and its partnering organizations since 1997, the Toledo-Lucas County Library, the Maumee Valley Historical Society, the Department of History at the University of Toledo, WGTE Public Media, and the Ward M. Canaday Center for Special Collections. In the present context, Toledo's Attic represents a convergence of multiple curation spaces, and the functional framework spans multiple institutions (see figure 1).

Technologies in the Curation Space

Digital technologies play a vital role in SoDC, as they represent the generational and professional diversity within ALPC communities and curatorial work in archives and libraries (see Tammaro 2016). As archives and libraries have expanded their curation spaces beyond their physical facilities, they have extensively relied on several types of digital technologies: collection management software (e.g., Archivists Toolkit, ArchivesSpace), digital repository platforms (e.g., DSpace, Islandora, and Omeka), finding aid discovery tools (e.g., ArchiveGrid, ArchivesHub, and SNAC), and social networking sites (e.g., Facebook, Instagram, WordPress, Tumblr, and Pinterest). While digital repository platforms run behind the systematic management of collections, the ultimate enablers of SoDC are the social media platforms. They are instrumental in harnessing community participation in building community archives under direct community supervision. Community experience, memory, and perspectives shape the discourse and all curation activity in social media channels used by local communities. As is evident in the combined use of Facebook and Omeka by the Front Runners New York LGBT running club (Cocciolo 2017), communities approach the use of digital technologies differently. Elsewhere,

communities are solely relying on Facebook, as exemplified by the East Toledo Historical Society, which utilizes a high level of community participation without a digital repository for long-term preservation.

Digital Libraries and Repositories

Most if not all archives and libraries have begun utilizing digital library or repository platforms like CONTENTdm, DSpace, and Islandora to curate digital collections on the Internet. Therefore, these technologies are instrumental in extending the curation spaces of archives and libraries because digitization produces digital surrogates and metadata records that become access points to entire collections. Curation spaces, in effect, can serve as channels for bidirectional discoveries by steering visitors from digital to physical collections and doing the same in the reverse direction. Internet users discovering the digital collections, metadata records, and digital finding aids online can use that information to request access to records of interest at the physical facility. Conversely, those perusing the physical collections may discover digital collections and virtual exhibitions featuring those collections online.

Digital repositories present yet another benefit to curators: support with internal document management and collaborative web content management, which further demonstrate the interconnectedness of curation spaces. This is facilitated by the dual architecture of content management systems (CMSs) operating in the backend of digital repositories and web content management platforms like WordPress and Joomla. Two essential building blocks comprise CMSs: enterprise content management (ECM) and web content management (WCM). ECM facilitates collaboration in the workplace by integrating internal functions such as document and digital asset management, whereas WCM facilitates collaborative authoring for websites, which is an external function (Rouse n.d.). This function allows curators to ensure the connection between the digital media and metadata records in the backend of the system with the organized information visible to the public. This architecture reinforces the role of digital repositories in the functional frameworks (curation spaces) and reinforces the relationship of curators to both the content and technology.

Social Media Platforms

Social media platforms such as Facebook, Twitter, Instagram, Pinterest, and others have become popular among the ALPC communities as vital tools in SoDC. These platforms are also an extension of curation spaces for heritage institutions that use these platforms to promote their collections, exhibitions, and programs and actively invite community participation. For example, HistoryPin and Whatwasthere.com are particularly popular because they allow curators to upload images of buildings and other historic spaces and present them on a timeline and a map showing current

street views of the spots occupied by the contributed images. Geospatial and temporal contextualization of historical data has become popular with the digital humanities (DH) crowd and the archivists and librarians supporting DH projects (Sabharwal 2017). These representations effectively relate to community memory and heritage, often triggering community response as was evident in a past public humanities project involving Joomla in socialized curation, which led to creating a virtual exhibition in 2013 titled "Local History through the Public Eye" (Sabharwal 2013). The project utilized Instagram Geo Gallery, then a Nordmograph module in Joomla that harvested feeds from Instagram to populate a "flip book" album. Participants were asked to take photos of historic buildings and other places of historical significance and tag their contributions with the #toledosattic hashtag.

Like DSpace and the other platforms, the architectures behind Facebook, Instagram, and Pinterest consist of building blocks for web publishing, content management, and storage mechanisms. Unlike the CMSs behind digital libraries, social media platforms support social interaction through image sharing, messaging, and display features such as Facebook walls. Archivists and librarians are using social media for announcements and discussions of collections. As such, social media has proved to be an ideal tool for SoDC because it can involve community participation and facilitate social purposing. Through social media, archives and libraries can make announcements, celebrate culturally significant events (e.g., Black History Month, International Women's Day, "On this day today" postings), release featured photographs from their collections, and invite responses from participating communities. The profiles, pages, communities, and groups in the Facebook environment enable ALPC communities to establish curation spaces for their respective institutions, communities, or topics of individual interest. They can extend curation spaces to other platforms also, as Blogspot, Tumblr, and YouTube are suitable for bloggers, and these platforms allow users to upload media and enrich their posts with hashtags. Others may prefer microblogging platforms like Twitter, Instagram, and Pinterest, and still others may prefer blogging platforms for discursive forms of writing (see Rosepoint Publishing 2018). In all, social media and digital library platforms are mutually complementary technologies with curator communities and public users approaching their use according to their personal and professional interests.

Curatorial Interventions

The digital environment for cultural heritage curation is far from being seamless for optimally effortless navigation and discovery. SoDC relies on the use of the Internet, where fragmentation is evident in curation spaces as well, resulting in challenges to discoverability. However, curatorial interventions such as interlinking can enhance discoverability.[4] Improving the

information architecture is analogous to improving physical accessibility of physical structures with signage, ease of use, and meaning of resources housed within. In both cases, curators play a vital role in providing meaningful structure and context to visitors. The relationship of interlinking and knowledge organization to SoDC merits deeper understanding because both interventions involve varying degrees of collaboration and community participation. For instance, involving curator communities beyond archives and libraries to add hyperlinks and hashtags can potentially improve navigating a curation space and discovering content. However, Wei et al. (2005) have emphasized the importance of informative hyperlinks to influence user navigation, while Noruzi (2018) suggests the use of "folks thesaur[i]" for hashtags to improve web indexing and information retrieval, which can indirectly improve experiences in navigating curation spaces. Facebook and Instagram members can add hashtags, geolocations, and web links to posts and discussions in order to reinforce the textual, social, and thematic relationships across the curation spaces. This opportunity is where local knowledge and perspectives can also enrich curation efforts.

Although deeply rooted in legacy practices of physical heritage institutions, documentation remains an important aspect of curatorial work on the Internet. It produces "the information necessary to facilitate future discovery, access, and reuse is comprehensive and correct; including metadata on the resource's provenance and the context of its creation and use" (Whyte and Wilson 2010). In the context of archival practices, the concept "[documentation] strategy [refers to] an analytical approach to archival appraisal that looks not at individual records, but at the overall universe in which such records exist" (Cox 1996, 144). In the present context, that universe is the Internet, in which both the physical and virtual domains of curation spaces have evolved. Social media has enabled communities to engage members in collaborative documentation of local history and cultural heritage as seen in the Denbigh Community Archive (Jones 2019). Collaborative documentation enables communities to enhance and correct the historical record in one continuous practice.

Interlinking

The combined causes of fragmentation on the Internet are technological, financial, political, and legal in scope and, therefore, out of curators' direct control. Fragmentations pose challenges to maintaining curation spaces within optimal reach. The primary purpose of interlinking, therefore, is to reinforce critical textual, thematic, and social connections across curation spaces of cultural heritage institutions. It can improve navigation and discoverability across curation spaces on the Internet populated by heritage institutions, curator communities, digital collections, and the technologies. Interlinking is a shared, or socialized (or democratized),

aspect of curation; it involves ALPC communities and the public to varying extents, allowing any curator to engage in interlinking. A common reason for interlinking is to point visitors to related collections and websites of institutions that curate collections of interest. Also, social purposing may mean adding specific links to bring public attention to disenfranchised communities and their experiences. The most common methods of interlinking had involved the use of HTML codes for hyperlinking across web pages prior to the arrival of social technologies. This approach has enabled curators to lead readers across their websites and to digital collections, virtual exhibits, and social networking sites and back. The use of QR codes has made it possible for heritage institutions to lead exhibition visitors from physical exhibits and collections to related web content and social media sites, using cell phones and tablets (see Conrad 2020). Even more recently, the addition of social plugins to websites has enabled curators to create visually inviting links, RSS feeds, and social buttons (most commonly for Facebook, Twitter, Pinterest, and Instagram) between their websites and social media sites. Interlinking, therefore, may also ensure consistency to the navigation of curation spaces if curators approach this kind of intervention within a framework of standards and best practices.

The theoretical framework around the sociotechnological aspect of curation space underscores the functional relationships across curation spaces. ALPC communities across the curation space represent several relationship models as identified in Kadushin's social network theory (2004). The directionality, reciprocality, and cardinality of curator relationships can shape collaboration and sharing in both physical and virtual networks, bringing Kadushin's work in line with Landow's (2006) theories inspired by works on intertextuality by Barthes (1974) and Kristeva and Roudiez (1980). Barthes defines *lexia* as "texts composed of blocks of words (or images) linked electronically by multiple paths, chains, or trails in an open-ended, perpetually unfinished textuality described by the terms link, node, network, web, and path" (quoted by Landow 2006, 2). Landow has identified four linking approaches: *lexia* to *lexia* (unidirectional), *lexia* to *lexia* (bidirectional), string to *lexia* (unidirectional), string to *lexia* (bidirectional), string to string (unidirectional), and string to string (bidirectional). In the present context, these approaches exist across collections, linked data bits (in the metadata records such as index fields like subject, names, or source collections), exhibitions, archival finding aids, metadata records, and social media discussions among related (that is, socially networked) ALPC communities and cultural heritage institutions. Information architecture, in turn, lends a structure to relationships in curator spaces and varying degrees of social, textual, and semantic cohesion through hyperlinks among communities and collections. While labeling, searching, and navigational systems (Rosenfeld and Morville 2002) uphold the structure and metaphoric representation of curation spaces, the

role of communication channels, using social media and other forms of electronic communication, in information architectures (Morville 2011) emphasizes the social dimensions of curation spaces. These communication channels exist mainly in social media where discussions, posts, and shares are signs of community participation. These activities are just as meaningful in the curation of community memory, history, and identity as digital preservation is because through discussions, participants share local knowledge and context.

Knowledge Organization

In contrast to the hypertextual and architectural frameworks for interlinking, the aim of knowledge organization (KO) is to reinforce semantic frameworks throughout the fragmented curation spaces. KO refers to "describing, representing, filing and organizing documents, document representations, subjects and concepts both by humans and by computer programs" (Hjørland 2016, 475), and there are ontological, organizational, and cultural dimensions of KO that shape the curation spaces and frame the practice of SoDC. As intervention, KO relies on metadata work of curators and the metadata-handling capabilities of platforms used for curation, which distinguish digital repository platforms from other CMSs and social media platforms and set a clear boundary between the use of professional classification and social ontologies as cultural-generational differences in practice. As not everyone in the ALPC communities works directly with digital repositories, library catalogs, metadata, and classifications, there are limits to SoDC, just as there are to community participation.

As Hjørland (2016) points out, KO practice in archives differs from that in libraries: KO in archives has evolved around the concept of provenance, or history of custody, which leads to the collocation of records by the source. In contrast, libraries use classification systems for information retrieval and spend considerable energy on subject-based classification in metadata records. Whereas the access points to library holdings are the title, author, or subject, primary access points to archival collections are the collection identifier (or manuscript number) and provenance, which often identifies the record creator and/or custodian. Both the provenance and subject-based classification systems (Library of Congress and Dewey) are hierarchical in structure. Archives rely on the *respect des fonds* method, the "entire body of records of an organization, family, or individual that have been created and accumulated as the result of an organic process reflecting the functions of the creator" (Pearce-Moses 2016f). ArchiveGrid, ArchivesSpace, and WorldCat have considerably facilitated searching for archival and library collections, but these are essentially extensions of archival and library catalogs on the Internet. Curation on the Internet, however, has not extensively relied on KO practices of archives and libraries. While documenting provenance has remained vital to professional

curators using ArchivesSpace and digital repositories, its importance has waned in social media (Yeo 2013) where the use of fake identities (see Krombholz, Merkl, and Weippl 2012) poses a challenge to documenting provenance. The question of contributor identity is vital to the integrity of record keeping, as institutional archives will not accession records without being able to record the history of custody on professional as well as legal grounds. Consequently, digital repositories and finding aid tools will not provide access to content and data without a verifiable history of ownership.

Enhancing discoverability is the aim behind KO. The reason for the lack of connections is not always technological or political; missing semantic connections may also be barriers to discovering collections in remote but otherwise interoperable systems. However, those approaches require thoughtful metadata planning and best practices. Interoperability is "the ability of computer systems or software to exchange and make use of information" ("Interoperability" n.d.) and includes four levels: foundational interoperability needed for information exchange between disparate systems, structural interoperability needed for syntax and uniformity of data exchanges, semantic interoperability needed for interpreting data across disparate systems, and organizational interoperability needed for the "secure, seamless and timely communication and use of data within and between organizations and individuals" (HIMSS n.d.). To varying extents, these types of interoperability affect curation spaces, and while archivists and librarians may not be able to configure all parts of their digital platforms, data and metadata interoperability are important. The former refers to "the ability of systems and services that create, exchange and consume data to have clear, shared expectations for the contents, context and meaning of that data" (Data Interoperability Standards Consortium n.d.), while the latter refers to "interoperability among different metadata schemas and their applications" (Chan and Zeng 2006).

Metadata interoperability is facilitated through the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH), which requires metadata to meet standards and expectations. Compliance with this protocol enables other services in the open data (and linked open data) environments to disseminate content (Open Archives Initiative n.d.) in order to allow access and harvesting of metadata records, allowing users and networked computer systems to discover contents on the Internet. The metadata handling capabilities of CMSs operating in digital repositories are crucial to curators' ability to add and manage collections throughout their lifecycle. These platforms support a wide variety of KO practices. Most curators of cultural heritage use Dublin Core (DCMI), but Metadata Object Description Schema (MODS), Visual Resources Association (VRA) Core, and other schemas are also common. Curators also use classification systems such as Library of Congress Subject Headings (LCSH) and lo-

cal subject headings for archival collections in combination with thesauri and controlled vocabularies such as the Art and Architecture Thesaurus (AAT) and the Thesaurus for Graphic Materials (TGM). As digitization frequently involves original cataloguing, curators in heritage institutions regularly use description standards such as Anglo-American Cataloguing Rules (AACR), Resource Description and Access (RDA, intended for digital environments), and Describing Archives: A Content Standard (DACS). However, not all curators in the ALPC community will (or can) use these standards. They will engage with technologies based on their affiliation with institutions, competency with digital technologies, and familiarity with content description.

Unlike the CMSs operating behind digital repositories, there is limited architecture for rich content description in social media platforms: hashtags, image captions, geolocation (as in Facebook and Instagram), and text make up most user-created data, while the platform automatically generates the dates, threads (context), and authors based on profiles, discussion threads, and posting times. For most social media platforms, KO is internally referenced, rendering these platforms silos. Crossfeeding is noteworthy across select platforms, as evident with Facebook postings also appearing in Twitter if so elected. However, a search within Facebook may not readily retrieve data from other social networks. Hinchcliffe (2014) has noted the irony in the lack of interoperability across the social media landscape: "A funny thing is happening along the way towards connecting all of us together via social media: We've ended up at a place where we have thousands of separate islands of communication, instead of the seamless, pervasive mass connectedness that seemed to be happening early on." He points out that despite the initial promises of social media, they turned out to be "digital walled gardens." Not only has the fragmented Internet contributed to the evolution of isolated curation spaces, but now these social silos are further shaping the Internet as a fragmented landscape. For curators affiliated with archives and libraries, the inclusion of social media in their curation spaces presents a benefit of connecting with audiences over the fragmented Internet. The degree of engagement of both types of technologies and the representational capabilities range from highly engaged institutional ones using digital preservation platforms and social media to minimally engaged community or personal digital archives using only a social media platform.

Cultural Practices in KO

SoDC has evolved in a curation space occupied by diverse ALPC communities contributing with diversity to collections and description practices. While excitement around diversity has been evident in professional literature, the implications for cultural practices for archives and libraries are significant. In his presentation, Gill (2003) attributed what he calls "cul-

tural infodiversity" to "curatorial approaches, subject disciplines, [data] granularity, level of detail, data structure, [and] data content values" (slide 4). Others (see Attig, Copeland, and Pelikan 2004) have echoed these critical points in maintaining robust digital libraries with rich descriptions in metadata records using multiple metadata schemata such as Dublin Core and VRA Core. However, even in robust platforms, there is a need for unique interventions as evident in an old case of virtual museum systems with disparate descriptive and contextual data created by multiple units. "In most museums, the written information that describes collections takes many forms, may rest in several departments, and may have been gathered at different times for various purposes. It is likely that different pieces of information gathered in different ways over time may overlap, and it is equally likely that some parts of existing descriptive information are unique" (Blackaby and Sandore 1997, 118). Blackaby and Sandore described three approaches: using a menu with links to the information resources (the easiest), creating a search engine to search across multiple disparate systems (most complicated), and designating an existing database for purposes of organizing all descriptions in a single system (moderately simple). A fourth approach involved building a text file, an index or mapping of disparate ontologies and other descriptive data, to bring (link to or harvest) disparate information into tangible relationships. They found that such an "ideal integrated information system [not existing then] would be one which retrieves directly from each production database within an organization, with a minimum of overhead—only the formatting and linking data between similar information across systems" (122). Present-day semantic technologies would facilitate these solutions, but diverse ALPC communities solely focused on using social media employing no formal metadata schema or controlled vocabularies are contributing to cultural infodiversity and disparate data simply because content representation goes past the limits of professional description standards and controlled vocabularies. A significant challenge to KO comes from diverging classification practices in library catalogs, CMSs, and social networks. Curation spaces are, in fact, frameworks for coexisting disparate KO systems rather than one marked by competing ones.

Concerns about social ontologies (folksonomies, social tagging) include opinions that they are open-ended, unsystematic, subjective, and unsophisticated, and lacking central oversight, which further impedes indexing and information retrieval (Peterson 2006; Lee and Neal 2010; Bar-Ilan et al. 2010). Supporters of social ontologies point out the value behind social tagging with collaborative indexing and group intelligence (Avery 2010), which underscores the value behind collaborative—that is, socialized (or democratized) and networked—curation practices in social networks. In their approaches to curatorial intervention, archivists and librarians can enrich metadata records by adding critically evaluated

hashtags to the subject fields. Such enhancements to the metadata record may improve the collocation of different collections, while curators may consider adding selected formal subject terms to social media postings. Thus, the continuous involvement of participant-curators outside archives and libraries may expand SoDC, making it a more inclusive path to description and social cataloging in shared curation spaces on the Internet.

Conclusion

Archives and libraries have significantly expanded their curatorial capabilities with digital technologies. Employing digital repository platforms such as DSpace, Omeka, and Islandora, CMSs such as WordPress and Joomla, and social networking sites such as Facebook, Instagram, and Pinterest, curators can not only make their collections accessible but also engage their audiences and invite community participation as part of a dual strategy in digital curation. This approach enables ALPC communities to preserve community memory, identity, and history while coordinating these activities with the preservation of digital media and structural integrity in a fragmented Internet environment. The term *socialized digital curation* (SoDC) expresses this double-sided engagement to curate both the physical and intellectual aspects of cultural heritage. The framework approach to support analysis throughout this article has aimed at identifying the individual components of the functional framework, which is also the curation space. The curation spaces represented both the physical and virtual aspects of curation spaces, a hybrid territory for curators to collaborate and viewers to participate in SoDC. These participant-curators shape the collection to speak for marginalized communities and represent diversity when met with barriers and other challenges. As a result of collaboration, the collections and exhibitions begin representing cultural and thematic diversity. The cultural, generational, and professional diversity of curators, in turn, expresses interest and choice in specific technologies (social media) and curatorial practices (classification and folksonomies) along those lines. Through collections and technologies, curators have also included social purposing as one of the goals for public humanities and other grassroots projects to speak about human experience, social injustice, and other politically inconvenient themes. Likewise, scholars have used their knowledge to create thematic research collections that inform and educate.

As concerns about the instability of technology and fragmentation of the Internet rose, curatorial interventions became necessary to enhance discoverability. Interlinking allows all participant-curators to create hyperlinks across curation spaces to underpin the textual and thematic relationships among collections, communities, and technologies. Knowledge organization has enabled curators to establish semantic relationships with the use of descriptive metadata and a combination of professional classification and social ontologies. Documentation, in turn, enables curators

to transfer knowledge to other curators through the creation of reports, datasets, blogs, and social media interactions. SoDC is related to each of these interventions. Interlinking and KO are particularly important, as they help curators make critical connections across thematically and semantically related collections and steer visitors through vast curation spaces across collections in digital libraries, virtual exhibitions, and social media sites. Functional frameworks make these relationships meaningful and sustainable.

What this study may also point out through the examples provided is that functional frameworks for SoDC are not monolithic or driven by any one technology or community. The framework approach to the analysis, however, has afforded the opportunity to identify each component in the framework or curation space, curatorial interventions, and the intrinsic relationships holding the framework together. The uniqueness of archival collections will rest on the uniqueness of their collections as well as human experiences. Despite the uniformity of metadata and archival description standards, "cultural infodiversity" (Gill 2003, slide 4) results from cultural diversity of curators, communities, and collections developed under unique circumstances. There are no two identical curation spaces just as there are no two identical archives and approaches to curatorial interventions.

Notes

1. For present purposes, discoverability—or "the quality of being able to be discovered or found" ("Discoverability" n.d.)—heretofore implies both accessibility and interoperability.
2. For their work on knowledge architecture, which inspired the current approach, see Applehans, Globe, and Laugero (1999). Knowledge architectures in the context of this work serve as frameworks for knowledge management and related projects joining people, content, and technologies in functional relationships within organizations.
3. The present usage of "curator spaces" in this study bears no relationship to the Curation Space module in the museum management software called Museum Space by Sirma Group.
4. Curatorial intervention has been addressed in various (primarily art-related) contexts (Olivares 2011; Levine 2017; Tillman et al. 2017).

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Arjun Sabharwal is an associate professor and a digital initiatives librarian at the University of Toledo's Ward M. Canaday Center for Special Collections. He received an MLIS and a graduate certificate in archival administration at Wayne State University in Detroit, Michigan. He develops and maintains collections in the University of Toledo Digital Repository, curates the Toledo's Attic virtual museum—a public digital history project since 1997—and manages the University of Toledo Open Journals system. His research centers around archives, digital curation, and digital humanities, and he has published and presented on related topics. In 2015, he authored *Digital Curation in the Digital Humanities: Preserving and Promoting Archival and Special Collections*.