Integrating Indigenous Knowledge in Non-Indigenous
Knowledge Systems and Institutions

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Abstract

Mainstream knowledge systems, classification schemas, and descriptive standards are firmly rooted in Western epistemologies which, more often than not, are inadequate, inappropriate, and inaccurate as methods for naming and describing Indigenous peoples, perspectives, and ways of knowing. Despite this, professionals in the field have been busy creating solutions to these problems by designing innovative tools and bespoke classification systems to serve as theoretical and practical models that can coexist within the larger infrastructures of the standard knowledge systems and technologies most widely used today. This paper offers depth and nuance to complex issues surrounding traditional methods for the description and presentation of cultural material related to native communities and Indigenous knowledge systems; explores the creation of alternative classification standards and metadata schemas; and investigates new digital platforms and tools that help facilitate the meaningful discovery of information for and about Indigenous peoples using both dominant and non-dominant knowledge systems and technologies.

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Introduction

The resources available to cultural and memory institutions make them appealing candidates to serve as authorities and caretakers of information, as well as the knowledge systems and structures that control how this information is organized, defined, labeled, and discovered. Unfortunately, the mainstream structures and people who have controlled the management and dissemination of knowledge have historically lacked the racial and cultural diversity of humanity, satisfying only the "parochial, jingoistic Europeans, North Americans . . .white-hued, at least nominally Christian" (Berman, p. 15) demographic; thus, severely limiting the points of view and voices that exists with regard to how others outside of this dominant group would identify and describe themselves and the world in which they live. Libraries, archives, and museums have a moral responsibility to balance the support given to the status quo in the past by giving equal voice to groups that too often have been marginalized and silenced. Fortunately, these institutions have recently been setting precedents for this professional obligation that has become apparent in recent years; examples of cultural and historical records being used to redress social wrongs and support the cause of justice and community consciousness among marginalized groups have increasingly grown more numerous and frequent. Archivists, librarians, and museum curators can now become active agents for change in accordance with their existing professional principles by taking steps to counter these pervasive, systemic biases which still permeate the classification, cataloging and descriptive practices used in these professions today.

By conducting historical research and qualitative case studies, this paper addresses the following questions:

(1) What technologies, tools, alternative classification schemas / thesauri, or other strategies can LAMs in cultural heritage institutions use to enable the meaningful discovery and retrieval of Indigenous knowledge?

(2) What technologies, tools, alternative classification schemas / thesauri, or other strategies offer LAMs non-traditional options for Indigenous subject access that can be searched in both dominant and non-dominant knowledge systems?

(3) What are the major factors that hinder or decrease the ability or incentive LAMs need in order to commit to indigenizing the descriptive metadata associated with their Indigenous collections?

This paper provides historical research on how information professionals in the cultural and digital humanities professions are helping one another address the problem of inherently biased metadata within their collections, specifically with regard to Indigenous peoples and ways of knowing, without having to completely dismantle the monolithic dominant knowledge systems and structures used globally. The presented case studies will shed light on important projects currently under way that could take the digital landscape to a new stage in its evolution, exploring how new tools and metadata strategies are capable of negotiating a fluctuating cultural and structural threshold, as well as their unique capabilities to support the fluid exchange of reliable information between Indigenous and global knowledge systems and descriptive metadata schemas.

Glossary

Controlled Vocabulary	Is "designed for applications in which it is useful to identify each concept with one consistent label, for example, when classifying documents, indexing them, and/or searching them." (ISO, 2011).
Classification	Is the "activity involving the components of grouping similar or related things together; separating dissimilar or unrelated things; and arranging the resulting groups in a logical and helpful sequence." (ISO, 2011).

Decolonization	Means "stepping back from normative expectations that (1) all knowledge in the world can be represented in document form, (2) to some degree, already is, and (3) Indigenous ways of knowing belong in state-funded university and government library, archive, and museum collections, especially for the benefit of society's privileged life." (Duarte & Belarde-Lewis, p. 678).
Indigenization	A "movement centering Indigenous knowledges and ways of being within the academy, in essence transforming institutional initiatives, such as policy, curricular, and co-curricular programs, and practices to support Indigenous success and empowerment." (Pidgeon, p. 77).
Indigenous Peoples	"Among the Indigenous peoples are those of the Americas, the Inuit and Aleutians of the circumpolar region, the Saami of northern Europe, the Aborigines and Torres Strait Islanders of Australia, and the Maori of New Zealand." (UN, n.d.). For practical purposes, the phrase "Indigenous peoples" may be used interchangeably when referring to any one or all of the above ethnic groups.
Indigenous Knowledge	Means "the understandings, skills, and philosophies developed by societies with long histories of interaction with their natural surroundings. For rural and Indigenous peoples, local knowledge informs decision-making about fundamental aspects of day-to-day life. This knowledge is integral to a cultural complex that also encompasses language, systems of classification, resource use practices, social interactions, ritual, and spirituality." (UN, n.d.)
Knowledge Organization Systems	"At a general level, knowledge organization systems may be defined as social systems and institutions that organize knowledge." (Doyle, et al., p. 114).
Metadata	Refers to "data that identify attributes of a document typically used to support functions such as location, discovery, documentation, evaluation, and/or selection." (ISO, 2011).
Metadata Schema	Are developed "in response to a community need and often gain wide acceptance or are widely used while still in development. Maintenance by nationally or internationally recognized centers of excellence, such as the Library of Congress, or support from a professional body increases both visibility and take-up so that they become a community's standard schema." (DCC, 2019).
Subject Heading	A word or phrase used to uniformly describe or represent a concept or a topic.
Thesaurus	A "controlled and structured vocabulary in which concepts are represented by terms, organized so that relationships between concepts are made explicit, and preferred terms are accompanied by lead-in entries for synonyms or quasi-synonyms." (ISO, 2011).

Literature Review

The published literature covered a range of topics which analyze both past and present relationships between cultural heritage and memory institutions, their digital collections, and the communities they serve; the powers and complexities of metadata in the field today; the obligations digital collections stewards have to society in fostering a democratic environment and how using technology to promote diversity, equality, and transparency is key to fulfilling this responsibility; and the increasing need to conceptualize a modernized framework that improves upon the current use of traditional archival standards and theories with respect to appraisal, selection, arrangement and description, preservation, and access. Much has been written on the topic of the inherent structural inequalities in metadata and the digital tools that are used to search for and retrieve authoritative information. The theories and ideas proposed thus far to subvert this issue have been realized, but on a very small scale. There is still much that remains to be understood and done as many digital tools and alternative descriptive practices are still being developed, and as such, have not yet been released or adopted by LAMs in the cultural heritage sector.

Research Design

The methodologies used to write this paper include both historical research and qualitative case studies. The information gathered comprises of existing data generated by academic scholars and professionals in the fields of library and information science, archival science, computational and metadata science, and digital curation, (etc.), as well as information gathered from unstructured, informal interviews with selected professionals in the above-stated fields.

1. Classification: The Fundamental Pillar of Western Knowledge

1.1. Library of Congress Subject Headings (LCSH)

> *"Subject headings carry a lot of weight. The right ones help a researcher find books on the topic he or she is looking for; the wrong ones, or none at all, can cut off all access to them...To name, to categorize and classify, to label and brand, to make linguistic determination, to signal, to define, to say, 'this is the world, these are the worlds that will represent you' – this is a powerful thing.."* (Tatiana de la Tierra, 2008, in her chapter in *'Radical Cataloging'*)

The Library of Congress Subject Headings (LCSH) has long been the dominant schema for subject-cataloging practices and is used by institutions on an international level (at least among English-speaking countries). The widespread adoption and use of these terms demonstrate the authority of LCSH as the leading system for controlled vocabularies. The fact that LCSH is widely used as the default standard for most institutions is beneficial from an interoperability and consistency standpoint. At the same time, however, such dominant Western knowledge organization systems (KOSs) are inadequate and unsuitable for authentic organization of Indigenous knowledge (IK), due to both the complexities and uniqueness of indigenous cultures and ways of knowing, as well as issues of the inherent pillars of bias, racism, and the colonial oppression that laid the foundation which LCSH still firmly stands and fundamentally relies upon for its structural support and continued survival.

The way the Library of Congress Subject Headings depicts, marginalizes – and sometimes omits, altogether – indigenous peoples' histories, their cultures, perspectives, and ways of knowing reveals a classification system confined to and riddled with "racism, sexism, American exceptionalism." (Doyle, p. 8). Specifically, within the context of Indigenous knowledge, Littletree & Metoyer (2015) explains that "researchers have found that LCSH and other mainstream knowledge organization systems severely limit the retrieval of Native language materials and

Native American topics. For example, the Library of Congress authority files for North American Indian personal names are often inaccurate, and it has only been since 2005 that the Library of Congress began using a standard authority list for the names of tribal governments." (p. 642). Webster & Doyle (2008) also astutely points out that "in both obvious and subtle ways, American Indians are treated as a remnant of the past. The E schedules in LC classification are a dumping ground for all things Indian. Medicine, education, psychology? You won't find material on those topics in the R. L. or BF schedules if it involves Native Americans because historic practice segregated us into a prehistoric people." (p. 189). To illustrate this point, Figure 1 (below) shows the Library of Congress' most current schedule for Class E, with American Indian history beginning at E51with "Pre-Columbian America – the Indians" and quickly ending at E99 with "Indians of North America – Indian tribes and cultures".

E11-143	America
E11-29	General
E29	Elements in the population
E31-49.2	North America
E51-73	Pre-Columbian America. The Indians
E75-99	Indians of North America
E81-83	Indian wars
E99	Indian tribes and cultures

Figure 1: Screenshot of LCSH Classes E11 – E99

1.2. Dewey Decimal Classification (DDC)

To truly appreciate the logic and design of a classification system, it is helpful to understand its creator(s) and the cultural and social contexts in which they lived. Melvil Dewey, the chief architect of the Dewey Decimal Classification (DDC) System and the founder of the American Library Association, was a 19th-century white, heterosexual, Christian, male academic who was raised in a deeply religious community located in upstate New York. In looking closely at the organizational structure of the original versions of the DDC, an undeniable – and troubling –

reflection of "who Dewey was as a person, what he valued, an what he believed" is revealed. (Schwartz, 2018). Not surprisingly, DDC has been repeatedly criticized for its treatment and classification of Indigenous topics. According to Moulaison & Bossaller (2017), some specific complaints of same include, but are not limited to: (a) classifying materials on native tribes in North America in the 970s "reinforces a stereotype that indigenous peoples are a 'vanishing race'"; (b) multiple topics associated with native peoples in North America are missing; and (c) DDC fails to categorize information about native tribes in North America in ways that they would categorize or group themselves. (p. 137). For example, rather than linking ethnic and national groups based on cultural relationships, which is the most important and relevant factor, DDC makes such correlations between ethnic and national groups based on solely on linguistic relationships, which is not representative of indigenous culture and ways of knowing. (Moulaison & Bossaller, 2017).

The global impact LCSH and DDC has on information retrieval is immense. In many cases, marginalization is reinforced in the controlled vocabularies used and the classification scheme organization applied unless that marginalized community is centralized and is the focus of that collection or institution. However, much has been done over the years to mitigate racial categories and otherness categories, or to offer options to the forced defaults that define mainstream controlled vocabularies and classification schemes. In the sections below, the hard work, creation, and innovation applied to developing such promising strategies, tools, and project initiatives which offer the potential to affect permanent and positive change in the digital and cultural humanities sector will be considered and discussed.

2. Indigenous Knowledge (IK) and Ways of Knowing

2.1. Background

Indigenous ways of perceiving and appreciating the world is founded in their understanding of relationships, and these indigenous perceptions of such relationships do not follow the same logic as the classification systems developed by the Western world. The importance of the relationships among people, family, land, ancestors, ideas, and with the cosmos, are central to an indigenous epistemology (Littletree & Metoyer, 2015), "which form the basis of gathering information about the world." (Deloria, V. 1978). Indigenous relationships between themselves and the world around them greatly influence the ways in which they classify and organize knowledge. Unlike the European standard for classifying knowledge, the systematic categorization of knowledge for indigenous peoples is "based on observations of patterns in nature and the ability to predict outcomes in nature, which is often different than the Western ways of viewing the world." (Littletree & Metoyer, p. 647). In addition, rather than systematically documenting their knowledge, indigenous cultures generated, transmitted, and received knowledge through oral traditions which were passed on from one generation to the next.

With over 600 distinct tribal communities within the United States alone, (Duarte & Belarde-Lewis, 2015) there is no one-size-fits-all definition of indigenous knowledge that is recognized and accepted by all tribes as being representative of indigenous ways of knowing. IK as a concept is broad and exists on a diverse, non-linear spectrum. Therefore, indigenous knowledge can have various meanings to different tribes or indigenous communities. However, one of the most reliable definitions for IK comes from the United Nations Educational, Scientific, and Cultural Organization (UNESCO), describing it as concept which "refers to the understandings, skills and philosophies developed by societies with long histories of interaction

with their natural surroundings. For rural and indigenous peoples, local knowledge informs decision-making about fundamental aspects of day-to-day life. This knowledge is integral to a cultural complex that also encompasses language, systems of classification, resource use practices, social interactions, ritual and spirituality." (UNESCO, 2017).

2.2. Challenges

Indigenous knowledge is synonymous with the concept of tacit knowledge, meaning it is implicit or inherent knowledge among a particular community. Because indigenous knowledge is implied or expressed through oral traditions, it is in danger of being lost unless it is somehow documented and preserved. In this same vein, when concepts and knowledge are adapted from an indigenous language into English, losing vital contexts and meanings of indigenous words in translation will always pose a threat to IK. To further complicate things, the oral traditions used to express and share indigenous knowledge is "embedded in community practices, institutions, relationships, and rituals," making these ontologies extremely "difficult to codify" in the first place. These issues, along with the additional concerns of individual ownership/copyright vs. communal ownership, open access vs. restricted access to sensitive materials, and linear vs. holistic hierarchies of classification make the theoretical and practical integration of such diverging knowledge systems in a digital environment challenging, yet doable.

3. Integrating Indigenous Knowledge

Libraries, archives, and museums (LAMs) have a moral responsibility to balance the support given to the status quo in the past by giving equal voice to those groups that too often have been marginalized and silenced. Many precedents have been set in recent years which promote this professional imperative, and examples of the use of descriptive metadata and new digital tools and platforms to redress social wrongs and support the cause of justice and community

consciousness among marginalized groups have increasingly grown more numerous and frequent. The following section discusses ways in which archivists, librarians, and museum curators have become agents for change in accordance with their existing professional principles by taking active steps to counter the biases of previous archival, cataloging, and descriptive practices.

3.1. Protocols for Native American Archival Materials (PNAAM)

In 2006, The Protocols for Native American Archival Materials ("Protocols") was compiled by 19 individual Native American and non-Native archivists, librarians, museum curators, historians, and anthropologists who, as a group, represented 15 Native American, First Nation, and Aboriginal communities in total. The purpose for drafting the Protocols was to "identify best professional practices for culturally responsive care and use of American Indian archival material held by non-tribal organizations." (PNAAM, 2007). Collaboratively written from an indigenous perspective, the Protocols is a comprehensive and thoughtful manifesto intended to "inspire and to foster mutual respect and reciprocity" between institutions and indigenous communities" (PNAAM, 2007). It also offers critical contexts to indigenous cultural heritage materials and provides guidance to non-Native collecting institutions by addressing the following fundamental principles:

- *"The recognition of the sovereign governments and associated rights of Native American communities;*
- *Issues in the collection, ownership, preservation, handling, access, and use of American Indian archival resources;*
- *The importance of building relationships, balancing different approaches to knowledge management, and mutual respect; [and]*
- *The need to expand the nature of the information professions to include Native American perspectives and knowledge." (PNAAM, 2007).*

Several professional organizations, institutions, and American Indian communities have endorsed the values and principles expressed in the Protocols document, including the American Association for State and Local History, First Archivist Circle, Union of British Columbia Indian Chiefs, Union of British Columbia Indian Chiefs Resource Centre, Native American Archives Section, the Association of Tribal Archives, Libraries, and Museums, and the Cline Library at Northern Arizona University. (PNAAM, n.d.) The most recent organization added to this list is the Society of American Archivists (SAA). In August of 2018, the SAA Council publicly announced their support for endorsement of the Protocols as an "external standard of the organization" (SAA, 2018), after SAA had previously declined to endorse PNAAM on two separate occasions in the past (once in 2008 and again in 2012). (SAA, 2018). In the same press release as their official endorsement of the Protocols, SAA issued the following apology: "The SAA Council acknowledges that endorsement of these Protocols is long overdue. We regret and apologize that SAA did not take action to endorse the Protocols sooner and engage in more appropriate discussion." Pringle (2019) highlights the significance of this endorsement, stating that it "provides further validation of its [the Protocols] continued acceptance and use." (p. 3).

Because every indigenous community and cultural heritage institution is unique, the Protocols should be interpreted and adopted based on their respective needs, goals, and abilities to do so. According to Pringle (2019), "the Protocols functions most effectively as an invaluable reference tool for non-Indigenous repositories seeking to strengthen their connections with Indigenous communities represented in their holdings." (p. 3). Although the proposed best practices and standards contained within the Protocols are not required and non-binding, LAMs are strongly encouraged to adopt and adapt the Protocols within their organizations to the best of their ability. Finally, the recommended best practices offered within the Protocols are not static,

but dynamic in nature, and will continue to expand and evolve. New components of PNAAM are on the horizon as various cultural institutions provide and publish case studies offering valuable insight on the adaptability of the Protocols, as well as helpful recommendations for LAMs on how they can create and implement the Protocols to meet specific institutional and community needs. These ongoing projects and case studies will eventually lead to the development of a scalable "Implementation Guide", which will serve as a template in the future for organizations seeking guidance on how to adopt the Protocols at their institution. (O'Neal, 2019).

3.2. Alternative Metadata Schemas, Digital Platforms & Tools

The International Federation of Library Associations defines metadata as being "any data used to aid the identification, description and location of networked electronic resources." In simple terms, metadata is data about data. Metadata "allows our digital artifacts to be located, accessed, and in some way, understood by users. Metadata. . . has the power to prompt deep discussions around culture, promote progressive change, and, like our technologies, embed and perpetuate cultural biases." (Honn, p. 13). As established in the preceding pages, marginalization is reinforced in the mainstream controlled vocabularies like LCSH and DDC, from which many descriptive metadata records are structured and organized. The recognized need for improvement of these monolithic constructs of classification and description gave rise to the creation of new and alternative ways information professionals working with digital collections in the cultural humanities provide access to and discovery of materials associated with many underrepresented and misrepresented communities. Efforts to mitigate the problem of bias in metadata to better represent and serve the needs of indigenous peoples and how they have been applied in the realm of dominant knowledge organizations systems and are investigated below.

3.2.1. Brian Deer Classification System (BDC)

Brian Deer, a member of the Mohawk Nation reserve, was Canada's first indigenous librarian. In the 1970s, frustrated by the incompatibility between indigenous knowledge systems and the Western epistemologies embedded in LCSH, Deer created a classification system that would accurately reflect indigenous ways of knowing from a First Nations perspective, "based on First Nations topics of interest designated through literary warrant and also through Deer's deep knowledge about First Nations histories, terminologies, and worldviews." (Duarte & Belarde-Lewis, p. 693). BDC was later adapted for use in British Columbia, and was adapted several more times for implementation, including: the University of British Columbia's Xwi7xwa Library (today's most visible and vocal user of Deer's system), the Cree Cultural Institute in Quebec, and the British Colombia Indian Chiefs Resource Centre (UBCIC). In 2004, the Xwi7xwa Library applied to the Library of Congress MARC Standards Office in an effort to legitimize the schema on an international level. In 2005, the request was granted, and the new schema (officially termed as the First Nations House of Learning (FNHL) Subject Headings was officially authorized as a thesaurus "which could then be fully indexed in the authorized subject headings MARC field (650) . . . enabling both browsable indexes and faceted searching by subtopic." (Doyle, et al., p. 113). Earning a universal classification status and receiving Library of Congress's acknowledgment as an recognized, standardized subject heading was no small feat, particularly for a controlled vocabulary that was originally designed to meet indigenous needs on a local, specialized scale. As with any system, BDC has its disadvantages; for instance, its limited scope cannot be applied to cover all "topics of interest to the Indigenous peoples of North America." (Weihs, p. 12). However, the theoretical nature of Deer's system has the potential serve as a possible framework or model that can be used globally with detailed guidelines on how to adapt it locally. Not being the

monolithic, standardized system like LCSH, BDC was designed to be flexible and regionally customizable. To further demonstrate its potential for widespread use and adaptation, the Xwi7xwa Library, during a presentation given at the Sorting Libraries Out Symposium in March of 2019, identified several aspirational goals they hope to realize in the future, one of which includes "enriching their metadata at the co-operative level to enhance the discovery of indigenous content North America wide." (Andrews, slide 18).

3.2.2. Mashantucket Pequot Thesaurus of American Indian Terminology Project

Sandra Littletree and Cheryl Metoyer from the University of Washington have been leading an effort for the Mashantucket Pequot Museum and Research Center to create a thesaurus more compatible with, or more closely defines, the American Indian approach to understanding the universe, while at the same time, complying with "national and international standards for thesaurus construction." (Littletree & Metoyer, p. 644). Still in draft form, this unpublished thesaurus was successfully tested in a museum setting to aid with exhibit description. As Littletree & Metoyer states, "[t]he Thesaurus is designed to be user-centered and to reflect the information-seeking behavior of Native and non-Native scholars and researchers who conduct research on American Indians. As a controlled vocabulary, the primary goal of the Thesaurus is to inform Library of Congress Subject Headings." (p. 641). Perhaps one of the most interesting aspects of this thesaurus is the visual in Figure 2 (below) which reflects fundamental aspects of Native American philosophies and ways of knowing the world (or the universe): the Spiritual, the Physical, the Social, and the Mental. Rather than using the Library of Congress's alphabetical and chronological approach to organizing knowledge, this hierarchical framework is based on the widespread importance of relationality and geography, reflecting a more accurate and preferable way to classify and organize indigenous knowledge systems.
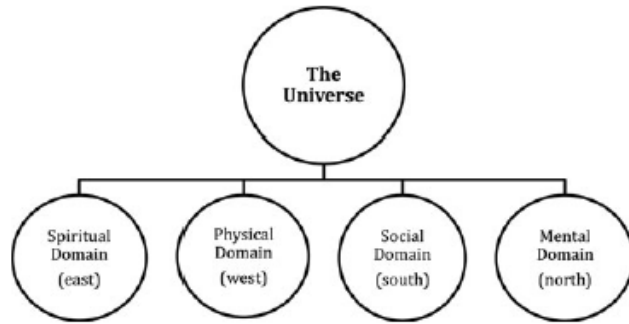
Figure 2: The Four Domains of the Mashantucket Pequot Thesaurus of American Indian Terminology (Littletree & Metoyer, 2015).

As discussed earlier with respect to the unique nature of indigenous cultures and the knowledge systems that correlate with each individual tribe, "[i]n theory, if every tribal government had a library of their own, organized according to the local indigenous epistemology or epistemologies (in the case of multiple peoples in one region), we would have over 600 distinct indigenous knowledge organization systems." (Duarte & Belarde-Lewis, p. 678). In a recent interview with Sandy Littletree (an enrolled member of the Navajo Nation and co-author of the 'Mashantucket Pequot Thesaurus of American Indian Terminology Project' article), Littletree was asked whether or not the particular framework in Figure 2 (above) could be applied across the country to different Native American tribal groups. "I think it can be," she responded. "I think that was the idea when it was developed. But it is hard. Thinking about the differences of the importance of water to indigenous people here in Washington [State], as compared to where I grew up in New Mexico where we didn't have that same relationship with water. How do you put that into a framework?" (Littletree, 2019). However, this is an area of great potential and possibility which could certainly be explored further, according to Littletree.

3.2.3 Mukurtu Content Management System (CMS)

The Mukurtu CMS is a free, mobile, and open-source platform custom built with indigenous peoples and communities in mind to provide for the co-curation and co-sharing of their

digital cultural heritage with archives, libraries, and museums. Mukurtu CMS began in 2002 as a grassroots project in dedicated to creating an online platform for an Australian Warumungu Aboriginal community who expressed their desire for a platform "whose functionality respected their dynamic social and cultural systems, relationships, and cultural protocols for sharing, circulating, and creating knowledge." (Christen, et al., p. 1). This project was the first time anyone had attempted to program or encrypt cultural protocols and relationships into the logic, infrastructure, or framework of an online archive or digital platform. (Christen, et al., 2017). That said, it is important to note that Mukurtu is not positioned as a library management system or an archival management system, and it is not a tool that builds on specific tools and workflows commonly seen in archival processing management tools. Mukurtu serves a bit of a different purpose in this area, as it is a broader collection management system developed primarily to serve as an access platform to cultural heritage material.

After launching Mukurtu's first archive for the Warumungu Aboriginal community, its creators, along with technologists and librarians at Washington State University (WSU) Libraries, formed partnerships with six tribes in the Plateau region, seeking to extend the original alpha version of Mukurtu to "incorporate existing library digital collections (with Dublin Core metadata) in a web-based platform including multiple tribes across several states who share common histories, but also unique tribal values, languages, and collections." (Christen, et al., p. 3). Out of this work, a new prototype was developed, called the Plateau Peoples' Web Portal (the "Portal"). The Portal, in essence, "expanded the functionality of the alpha Mukurtu platform, creating an online, multi-tribal digital archive with more administrative features, extended access management parameters, and differential metadata requirements across fields between Native communities and collecting institutions." (Christen, et al., p. 3).

In addition, the Portal addresses institutional concerns regarding metadata integrity and uniformity. Within the infrastructure of the Portal, "each collecting institution provides metadata for the content that they contribute to the Portal. Tribal administrators enter expanded metadata derived from their communities called 'Tribal Knowledge', and update catalog information under the 'Tribal Catalog Record'." (Withey, p. 4). Likewise, institutional administrators (i.e. WSU or the Smithsonian Institution's National Anthropological Archives "NAA" and National Museum of the American Indian "NMAI") cannot edit the information added by tribal communities under the "Tribal Knowledge" or the "Tribal Catalog Record" tabs. Through the layering of tribal metadata in one space, this system protects the "integrity of institutional metadata while simultaneously adding to the record." (Withey, p. 3). "Replacing the notion of the stand-alone item or record with succinct metadata, the digital heritage item shows the overlapping, shared, sometimes competing and always growing conversations around culture, place, and history." (Christen, et al., 4). Figures 3 and 4 (below) offer a visual representation of the layered narratives and metadata elements within a digital heritage item (i.e. record) on Mukurtu.
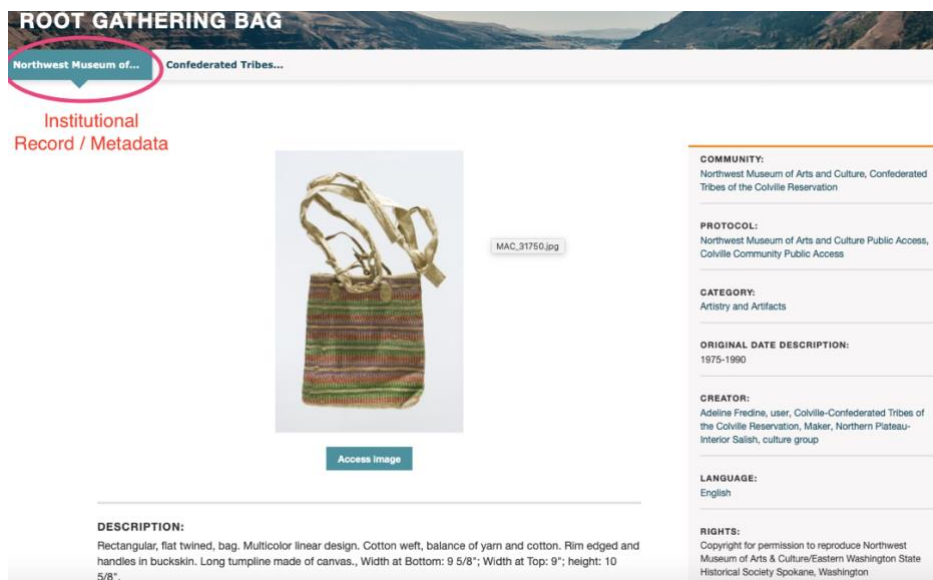

Figure 3: Screenshot of 'Root Gathering Bag', digital heritage item from Plateau Peoples' Web Portal – Institutional Layer

Figure 3 (above), shows the digital heritage item, "Root Gathering Bag", as presented from the institutional (Northwestern Museum of Arts and Culture) layer. Contrast this view and the information provided under the institutional layer with that offered under the tribal community (Confederated Tribes of the Colville Reservation) layer in Figure 4 (below). Between the two communities, there are several differences in both the item's bibliographical record as well the level and depth of contextual information being provided for the same object. This just one example of how Mukurtu places institutional metadata side-by-side with Native knowledge using an integrated metadata schema.
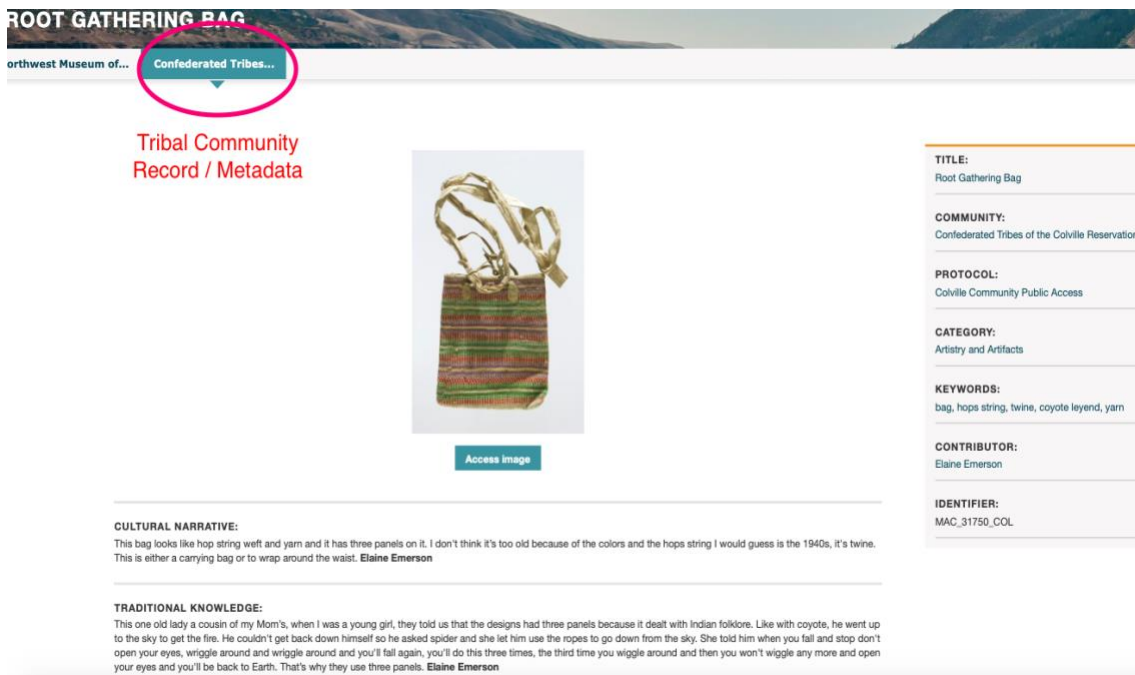

Figure 4: Screenshot of 'Root Gathering Bag', digital heritage item from Plateau Peoples' Web Portal – Tribal Community Layer

What sets Mukurtu apart from any other content management system currently being used in the cultural heritage sector among LAMs includes the tool's sustainability and scalability, as well as the following innovative features:

- "Cultural protocol-driven access parameters based on local knowledge systems providing granular levels of access and control of content metadata;
- Pathways for sharing content and metadata between multiple community groups;
- Flexible and clear licensing and labeling parameters for content; and
- Selected metadata transfer between collecting institutions and indigenous communities using Mukurtu's 'roundtrip' feature." (Withey, p. 4).

The new "roundtrip" feature is significant and unique from other systems on the market in that it "allows content and metadata to move 'in and out' of Mukurtu CMS and other content management systems (with CONTENTdm at WSU, EMu at the Smithsonian, and Museum Plus at the Northwest Museum of Art and Culture (MAC)) at a granular level – so communities can choose to share all metadata associated with items or collections, or they can define which fields to not include." (Withey, p. 4). Furthermore, Mukurtu currently uses its own metadata schema based on Dublin Core (Mukurtu Core), offering "more flexibility with fields such as free tagging and narration." (St-Onge, p. 50). Likewise, Mukurtu also does not pre-populate any subject taxonomies, leaving this particular task up to users to develop themselves.

In 2018, WSU received a grant from The Andrew W. Mellon Foundation to support the expansion of Mukurtu CMS to create Mukurtu Shared, "a culturally responsive online platform and process for ethically curating Native American materials within cultural, linguistic, and social protocols." (Aumen, 2018). Mukurtu Shared will "continue to be hosted and sustained by WSU, so other institutions and communities will not need to maintain the platform or switch form their existing infrastructure" and seeks promote "collaborative curation between tribal archives, libraries and museums (TALMs) and federal repositories partnering on the project." (Aumen, 2018). Dr. Kimberly Christen (Withey), the creator and mastermind behind the philosophy of Mukurtu, believes that "[b]y providing a standardized, replicable workflow and shared online

platform, Mukurtu Shared will, in essence, change the way federal repositories curate their Native American collections, promoting collaboration at all stages, and it will give repositories of Native culture a new model for collaborative curation." (Ibid Aumen, 2018).

Since its launch several years ago, Mukurtu CMS has been used by more than 600 groups of indigenous peoples and other marginalized communities around the world who want to curate and regulate their own materials based on the uniquely specific needs of their respective cultures. Users include the Plateau Peoples' Web Portal, "which utilizes the platform for the exchange and curation of collections from diverse repositories across Washington, Oregon, Montana and Idaho, as well as the Library of Congress' American Folklife Center (AFC), which uses a Mukurtu labeling system" (Traditional Knowledge "TK" Labels, introduced in the next section below) "in its records and discovery system for Native American Collections." (Aumen, 2018). Other partners include, but are not limited to, the Smithsonian Institution's NAA and NMAI, the California Indian Museum and Cultural Center, and the Center for Digital Scholarship and Curation.

3.2.4. Local Contexts and Traditional Knowledge (TK) Labels

Emerging from the Mukurtu project, Local Contexts is an initiative that focuses on technical and legal strategies for managing, sharing, and protecting digital heritage. After years of testing, meeting with local communities, and collaborating with developers, the Local Context project team created the Traditional Knowledge (TK) Labels to be used as a complimentary tool to Mukurtu and was unveiled in 2014 as one of several new customization features of the Mukurtu 2.0 software release. Simply put, TK Labels "were designed to be utilized by communities who, due to colonial practices of collecting and western definitions of authorship and ownership, are unable to assert legal control over their collections." (Montenegro, p. 739). TK Labels addresses the very specific needs of indigenous communities as they manage their digital cultural heritage

and content by providing "context to public domain and third-party owned works circulating to the general public." (Christen, et al., p. 6). Unlike Local Contexts' TK Licenses (addressing indigenous needs with respect to intellectual property), TK Labels are not binding; they are educational and informational tools that apply to materials a community does not hold the copyright for or is already part of the public domain. TK Labels can be compared with Creative Commons' Fair Use labels, as they are also essentially a guide for social action (or inaction), requesting users to respect what has been identified by the tribal community as either inappropriate or appropriate use of certain content.

Currently, there are 17 digital tags (see Figure 5 below) that "can be included as associated metadata into diverse digital information contexts – CMSs, online catalogs and databases, finding aids, online platforms – assisting in the recognition of, and education about, the culturally appropriate circulation, access and use of indigenous cultural materials." (Montenegro, p. 739.) For example, the "TK Outreach (TK O)" label clarifies that the content may be used for educational outreach activities, but not for any use or activity outside of this specifically stated purpose.
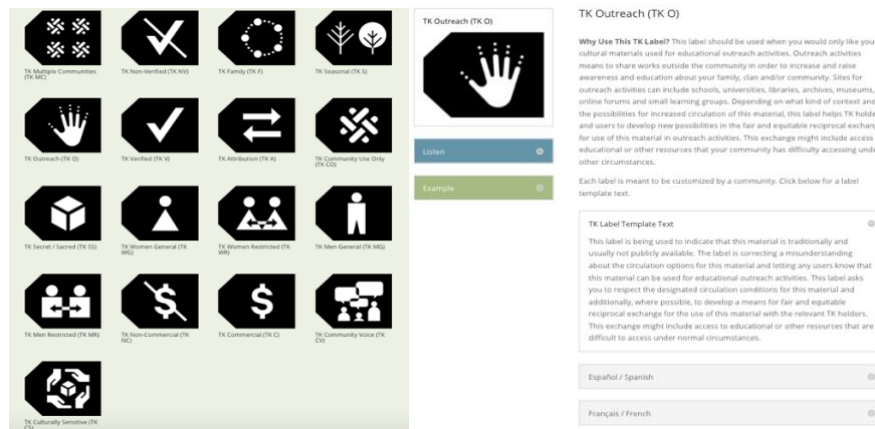

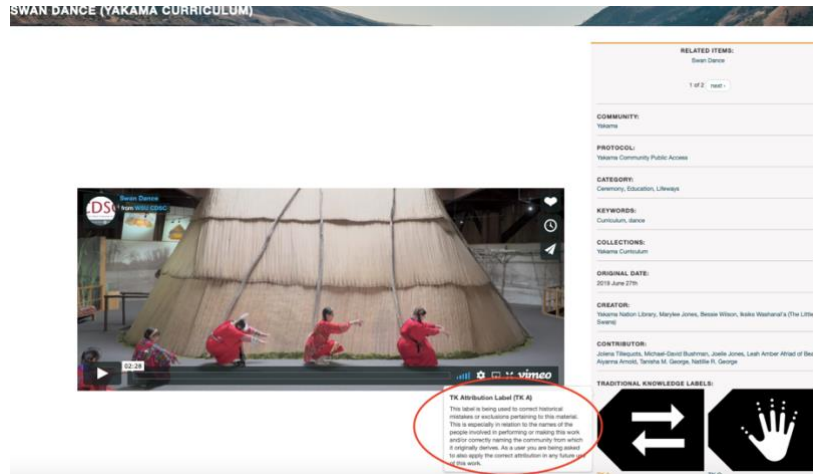*Figure 5: Screenshots of Traditional Knowledge (TK) Labels & TK Outreach Label Description*
https://localcontexts.org/tk-labels/

Figure 6: Screenshot of Swan Dance video on Plateau Peoples' Web Portal with TK Labels
https://plateauportal.libraries.wsu.edu/digital-heritage/swan-dance-yakama-curriculum

As seen in Figure 6 (above), TK Labels, much like Creative Commons, can be mixed and matched. They can also have community text attached to them, so tribal communities can customize the labels to help users make responsible choices with their digital heritage on how to use it, or if to use it at all. By giving users more information about the materials they find online, it is hoped that TK Labels will facilitate discussion between indigenous and non-indigenous people about cultural heritage materials, and will teach non-indigenous persons that there are other ways in which certain material either can or cannot, or should or should not, be used and understood.

3.2.5. Future of Libraries is Open (FOLIO)

The Future of Libraries is Open (FOLIO) is a collaboration of libraries, developers, and vendors building an open source library services platform. Although FOLIO primarily caters to the specific needs of libraries, this library management system (currently undergoing its final stages of development) is "intended to be extensible enough to allow customization at all levels through the enhancement or replacement of core modules, or the addition of community or locally-built apps that provide added functionality." (Owens & Thomas, p. 66). In other words, FOLIO will support traditional resource management functionality that can be extended into other

institutional areas, such as archives and/or museums. In addition to being built on a microservices architecture, the most significant aspect of FOLIO (as it relates to the research questions and topics of this paper) is the tool's metadata management component. The metadata application, known as 'Inventory', is the FOLIO app "where bibliographic information from a variety of sources can be presented in a uniform, abstracted form for management of the collection, regardless of the format or content rules used to describe a resource." (FOLIO Metadata Management Special Interest Group, 2018). Owens & Thomas (2019) goes on to state that "for FOLIO to be format agnostic, an app is required with which all other FOLIO apps can interface so that when new apps and data formats are introduced, it is not necessary to reengineer all existing associated apps to be able to work with the new data format. Inventory is that app for FOLIO." (p. 68). Right now, the FOLIO platform is MARC-centric, but in the near future, various types of metadata schemas will eventually been mapped to the FOLIO data model, allowing for the consumption of collection information based on Encoded Archival Description (EAD), for example, which can then be represented alongside both MARC bibliographic data and BIBFRAME data. In addition, FOLIO is starting the process for envisioning how it can consume linked open data (LOD) and manage collections locally (or externally) that are described using different types of schema.

During a recent interview with Christie Thomas (Head of Metadata Management Services, University of Chicago Library, and member of FOLIO's Metadata Management Special Interest Group), she indicated that there are two new Special Interest Groups (SIGs) in the process of joining the FOLIO project – a Special Collections SIG and an Archives SIG – both of whom are interested in exploring the ways in which this platform can integrate with the systems they already use, as well as how this system can provide an opportunity to reimagine or rethink their current systems' workflows. (Thomas, 2019). Due to the agnostic nature of FOLIO, along with its flexible,

scalable infrastructure, it is increasingly being recognized and seen as a way to negotiate between different types of datasets that an institution may hold internally; it's also being posited as a way of negotiating between different types of datasets between or across institutions, making it an attractive candidate as an open-source tool that is user-focused, collaborative, diverse, and future-focused, (being open to the possibility of change in the future).

4. Case Studies

The following sections provides a brief analysis of information gathered from the four participating institutions that were deemed relevant to the research questions posed at the beginning of this paper.

4.1. The Newberry Library

(Interviewee: Rose Miron, *Director of the D'Arcy McNickle Center for American Indian and Indigenous Studies*)

The Newberry Library's Edward E. Ayer Collection contains print materials relating to the discovery, exploration, and settlement of the Americas and is "one of the strongest collections on American Indians in the world." (The Newberry Library, n.d.). This collection contains materials in excess of 130,000 volumes, over 1 million manuscript pages, 2,000 maps, 500 atlases, 11,000 photographs, and 3,500 drawings and paintings on the subject of the American Indian.

The Newberry Library currently uses no specific technologies, digital tools, or alternative models of indigenous classification schemas or thesauri that would facilitate the discovery of American Indian cultural heritage or historical content in their collections. However, they would like to look into using Mukurtu for newly acquired collections in the future, but the only issue is that Mukurtu runs on Drupal, which means the Newberry would need to hire a Drupal developer to help build their version of a Mukurtu site. In addition, the Newberry is committed to the Library

of Congress Subject Headings, despite efforts to push for the Library to adjust its policies and update and add – not replace LCSH – more appropriate subject headings that accurately reflect a particular Native community. The size of the collection, as well as the time and manpower required to do an "entire overhaul" are the main challenges preventing the Newberry from revisiting the existing metadata and updating the records to reflect the values of the Newberry Library. In the meantime, the indigenous studies librarian keeps a running list of subject headings that need to be changed, as well as a running list of cultural heritage items that have been flagged as being culturally sensitive (such as TK Labels, which is something they hope to implement one day) or content which needs restricted access altogether – something which their superiors have explicitly communicated as not being an option at this time. Keeping these lists and spreadsheets is a sign that Miron and her colleagues are hopeful that at some point in the future, the Newberry will take steps to move forward with these efforts, but until then, she is of the mind that "we can be doing something rather than doing nothing." (Miron, 2019).

Another issue impeding progress in the areas discussed above is the Newberry's reluctance to be more transparent and open about their priorities, as well as its inability to confront its institutional history. In this context, Miron (2019) asks: "Can we talk more about the history of our major collector, Edward E. Ayer, who collected most of these materials from anthropologists who, in many cases, stole them from native communities? Can we talk about the fact that Walter Newberry, who made his money off of real estate investment in Chicago, benefited off of settler colonialism and the dispossession of native people from what is now known as the City of Chicago?". If the Newberry's goal is to get more native people to engage with the collections at the Newberry, then they have to make structural changes in order to make themselves more approachable and welcoming to Native communities.

4.2. Indiana University Bloomington Library (IU)

(Interviewee: Julie Hardesty, *Metadata Analyst*, *Associate Librarian*)

The Indiana University Bloomington Library houses more than 4.6 million volumes supporting the disciplines of the humanities and social sciences, in addition to IU's international and area studies collections, which includes interdisciplinary research in African Studies, Russian and East European Studies, Uralic and Altaic Studies, East Asian Studies, and West European Studies. Unlike the other cases in this study, IU does not house any indigenous digital cultural artifacts or knowledge materials, other than the normally circulating materials about indigenous peoples generally found in libraries.

IU currently uses no specific technologies, digital tools, or alternative models of indigenous classification schemas or thesauri that would facilitate meaningful discovery and access to indigenous cultural heritage or historical content in their collections. LCSH is engrained in the library's practices – as most are – and there is currently no movement or action within the institution to mitigate the problematic terminologies and classifications of LCSH. However, similar to the Newberry Library, there are several individuals (including Hardesty) within the Bloomington Library who are aware of these issues and highly interested in coming up with creative ways to resolve them. One potential avenue that could theoretically work in this space would be the use of a web application called Hyrax, a digital repository interface that functions as a content management system as well as an end-user discovery system. Hyrax can be installed with controlled vocabularies (mainstream only) pre-loaded into RDF fields, or it can be installed with no vocabulary so the user can set up their own. Hardesty is trying to work out a way in which vocabularies from marginalized communities are set up behind these empty fields by default. This experiment is still a work in progress. Another approach for digital platforms providing end-user

discovery would be replicating the search interface of the IHLIA LGBT Heritage Collection based out of the Netherlands. As seen in figure 7 below, based on the keyword(s) used in an initial search, this tool automatically generates related terms that could potentially improve one's results. This interface is unique in that it shows the user what other additional (yet also relevant) connections exist within the larger subject headings. Implementing a user interface similar to this in any context (marginalized, non-marginalized) would be incredibly helpful on any digital platform functioning functions as an information retrieval tool.
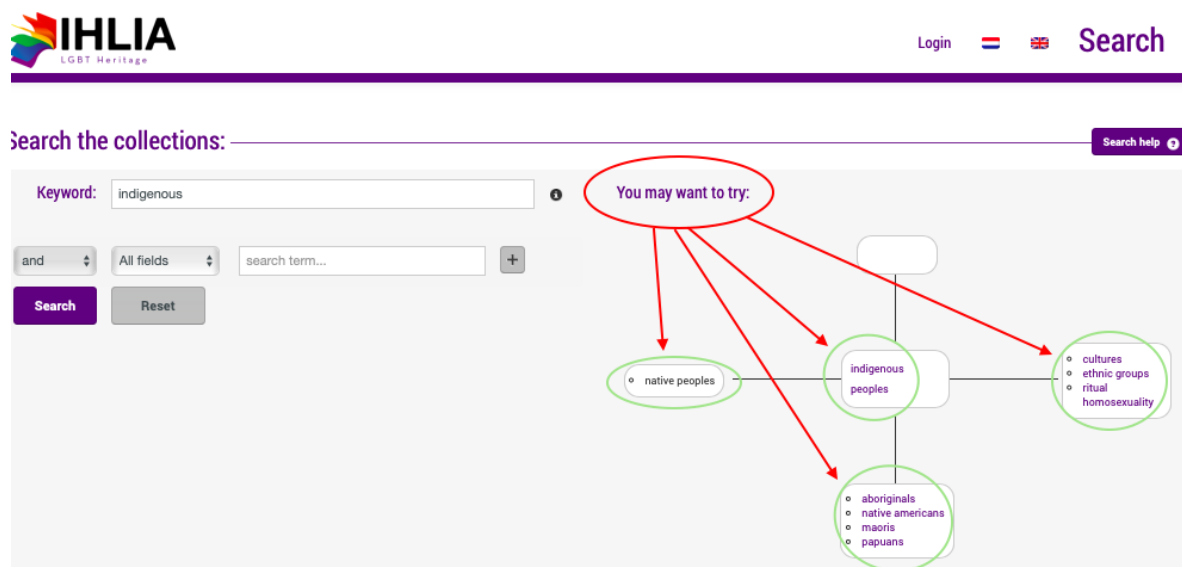

Figure 7: Screenshot of IHLIA LGBT Heritage keyword search / alternative terms for "indigenous"

4.3 The American Philosophical Society

(Interviewee: Brian Carpenter, *Curator of Native American Materials*)

The American Philosophical Society (APS) was founded in 1743 by Benjamin Franklin and functioned as the Nation's original Library of Congress while the American capital was still located in Philadelphia. The APS is the "oldest repository in North America of archival materials on the languages, cultures, histories, and continuing presence of Indigenous peoples of the Americas." (Carpenter, p. 2). As of today, these collections consist of about 1,900 linear feet of

manuscripts, photographs, and audiovisual materials relating to more than 650 indigenous cultures of the Americas, dating from 1553-2017. The APS provides online users access to an impressive suite of online guides and search portals to access information in its collections along with selected images and documents from the manuscripts, printed materials, graphics, Digital Library, and Museum collections databases (APS, 2019).

Currently, APS is working with approximately 50 indigenous communities on a regular basis, and they have been engaging in community outreach initiatives for several years. During these relationship-building, community efforts, APS was able to pick up on continued patterns of needs among indigenous groups, especially in the realm of how collection materials are described and how people can find them. In response to these needs – as well as the fact that the majority of the researchers using the materials (totaling approximately two-thirds of the requests received over the last several years) were from indigenous communities, ranging from individual people, to indigenous organizations, cultural centers, language programs, and schools – APS created the Indigenous Subject Guide, a searchable platform with an interactive geographic map that allows for highly-tailored searches on indigenous knowledge, supported by the use of appropriate terminologies and subject headings that reflect indigenous ways of knowing and understanding the world around them.

APS has not set Mukurtu CMS up at their institution yet, but they plan on doing it next year. This only seems natural, as Carpenter has worked alongside the Mukurtu team for a number of years as they have been developing the platform. The implementation of TK Labels at APS is currently underway and may also get launched as soon as next year. Policy-wise, APS is on board with the change, but as far as technical issues go, they still need to work out some kinks in the

workflow before they go live with TK Labels, as it could potentially cause confusion or conflict if one was placed somewhere inappropriate or by mistake.

In terms of descriptive practices, APS started to listen more closely to how people were asking for the materials they were looking for; in other words, how they conceptualize their requests and how they phrase their requests are usually the kinds of terms they would use to conduct a general search online. Here, Carpenter (2019) brings up yet another interesting and valid point: "Whether LCSH matches it or not, and whether that subject heading is appropriate or not, it just may not be the term people are thinking of in the first place. And even if APS used a different cataloging schema that might be created as remedying a lot of problems of LCSH, that, too, might not necessarily be the term that people bring to a particular subject material."

As far as decolonization goes, APS has not thrown out or used the term of 'decolonization' a lot. Carpenter (2019) stated: "I'm not always sure if I, as a white man, at an institution curating indigenous material, should be declaring that that's what I'm doing; I'd rather just share the work and say, 'we're supportive of this; here's what we're doing; you tell us if that's what you would call it or not'." APS has had problems with approachability in the past. Carpenter said that APS has had several indigenous people express that they have been trying and wanting to access materials in their collections for 20 years, but they thought they had to go through somebody else. It's not necessarily the biggest problem in terms of the day-to-day activity, but if someone cannot get past that first hurdle of knowing they are welcome, then nothing else matters. If they don't want to engage with an institution, or if they think that the institution doesn't want to engage with them, then it doesn't matter what its policies are. "Accessibility, collaboration, outreach – all of that presumes that people know that you're interested in actually working with them, and it's been

very reasonable for indigenous communities to not expect that, because that's been the norm for a very long time." (Carpenter, 2019).

Conclusion

> *"The descriptive challenges facing digital records is not technical or social, but both technical and social. Considering one without the other obscures how humans use information technology, which is to achieve both technical and social ends."* (J. Drake in *'RadTech Meets RadArch: Towards a New Principle for Archives and Archives Description'*)

Institutions in the cultural heritage and digital humanities sector are just beginning to understand and appreciate the fact that there are other ways of seeing and other ways of knowing. While colonial practices of LCSH or DDC in cultural heritage and memory institutions have oppressed, misrepresented, and erased marginalized communities and their cultures, the act of decolonization can erase the errors of the past, which has the potential to be equally as damaging to society. Adapting, creating, and adopting metadata schemas and thesauri that are culturally responsive and inclusive, and using them in conjunction with digital platforms and tools that are technologically agnostic in nature, is one way to begin dismantling colonial attitudes we find embedded in our digital infrastructures. Most importantly, however, community collaboration and engagement with Indigenous groups is ultimately the controlling factor that informs much (if not all) of the descriptive practices LAMs should adopt in order to begin the process of indigenization. Building these relationships and establishing mutual trust through these collaborations also informs what kinds of tools and platforms need to be created in order to meet the needs of Indigenous peoples. Schemas like Brian Deer and platforms such as Mukurtu or FOLIO are prime examples of how LAMs can provide meaningful access to Indigenous knowledge, shifting the way people hear Indigenous voices, understand Indigenous histories, and appreciate Indigenous cultures, finally integrating them into mainstream knowledge systems and structures.

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