

IMAGE DESCRIPTION AND INDIGENOUS CULTURAL HERITAGE COLLECTIONS:
AN EMPIRICAL ANALYSIS

by

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Abstract

The purpose of this study is to compare models for image description with calls for self-determination and collaboration when considering online collections of Indigenous visual culture in the United States and Canada. Library and information studies models for providing subject access to images frequently draw upon Erwin Panofsky's multi-level system for performing iconographical art historical analysis. Image description models, which rely on the *Ofness* and *Aboutness* of an image, threaten to impose a static meaning of an image rather than a dynamic interpretation that is indicative of traditional knowledge systems. Furthermore, discussions which stress expertise for effective image description and indexing prioritize Western epistemologies and bias-laden controlled vocabularies while the call for community collaboration in determining knowledge organization for Indigenous materials calls into question what counts as expertise and who is considered an expert. For library and museum professionals tasked with bridging the semantic gap inherent in translating image to text, the question remains whether effective image description is achievable, whether it can be done responsibly, and whether this is supported through best practices guidelines and controlled vocabularies.

This study employs content analysis of image subject metadata for Indigenous visual culture from twenty case study libraries and museums to determine how images are being described as well as observation of institutional efforts to incorporate Indigenous voices and perspectives in institutional contexts. Additional data was gathered through questionnaires from cataloguers at each case. This study will examine not only the issues surrounding image indexing and description, but also organizational cultures and their effect on metadata creation, including differences in cataloguing depending on organizational context and professional values or *modus operandi* between museums and libraries. Additionally, the focus on Indigenous visual culture brings unique challenges and professional responsibilities that must be addressed. The goal of this study is not necessarily to reveal collections and institutions that do this most effectively, but to demonstrate the factors that make it possible to do so and to discover whether institutions can navigate the landscape of "best practices" in a way that is effective for users and responsible to the communities represented.

Lay Abstract

Guidelines for providing access to images require cataloguers to describe the subject matter of the image using free text description and/or controlled vocabularies. Methods for providing subject access instruct cataloguers to describe what the image is of *Of* and *About*. Approaches to this type of image cataloguing vary greatly in professional practice between libraries and museums. Additionally, in recent decades the LIS and museum community have sought partnerships with Indigenous communities in order to find ways of describing Indigenous cultural heritage in a manner that reflects traditional knowledge systems, and addressing how cultural heritage institutions have denied agency and access to Indigenous communities reflected in their collections. This study examines subject headings used by twenty libraries and museums in Canada and the United States for their collections of Indigenous cultural heritage, analyzing the efficacy of image description methods and whether they reflect or critically engage with this fraught history.

Preface

This dissertation is the original intellectual product of the author, Michele L. Jennings. The survey data gathered was covered under research application H17-00659 and project title Image Description and Indigenous Cultural Heritage Collections: An Empirical Analysis, approved by the UBC Behavioural Research Ethics Board on May 3, 2017.

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List of Abbreviations

AACR2: Anglo-American Cataloguing Rules, Second Edition
AAT: Getty Art and Architecture Thesaurus
CCO: Cataloguing Cultural Objects
DPLA: Digital Public Library of America,
LCSH: Library of Congress Subject Headings
LCTGM or TGM: Library of Congress Thesaurus of Graphic Materials
FNHL: First Nations House of Learning
MARC: MACHine-Readable Cataloguing
VRA: Visual Resources Association

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Land Statement: This thesis was planned, prepared, and submitted on the traditional, ancestral, and unceded Indigenous territories of the ʷməθkʷəyʼəm (Musqueam), sḵwx̱wú7mesh (Squamish), and sel'íl'wítulh (Tseil-Waututh) First Nations. As a guest on this land, I am thankful to have been able to grow in understanding and learning here.

1. Introduction

1.1 A Note About the Author

The author's identity as a non-Indigenous person of Western European descent is an aspect which is constantly being negotiated and contextualized in the course of this research. Whenever possible, I prefer to use the words of Indigenous authors to describe particulars regarding Indigenous knowledge and epistemologies in the hope that this truth will not be compromised by my flawed interpretation. While I aim to observe and report what I find in a thoughtful way, I am deeply aware that I am limited in my understanding and perspective on this topic and strive to discontinue the legacy of many scholars perpetuating and regurgitating Western inferences on Indigenous knowledge.

1.2 Discussion of the Topic

1.2.1 Introduction.

The literature which details image description and retrieval is astounding in its volume and the rapidity with which it has multiplied; Enser (2008b) began their discussion of the history and development of visual information retrieval by noting that the proliferation of studies on this topic is strongly tied to increased availability of images in digital form beginning in the early 1990s. Formerly, image retrieval processes closely mirrored that of traditional reference exchanges, and were strongly shaped by “the picture researcher’s knowledge of the collection, and of the classification and indexing practices adopted by the repository; it also reflected the researcher’s judgement, based on visual inspection of any candidate images” (Enser, 2008b, p. 532). The practice of classifying and indexing an image might also closely follow traditional library subject analysis practices, which “involves analyzing the subject content of the works, assigning subject terms to describe and provide access to the publication, and often identifying an appropriate designation within a classification system. [...] Bibliographic description enables intellectual access to the resources and serves as an inventory of the holdings” (Timms, 2009, p. 73).

Models for describing images have drawn upon disciplines from cognitive psychology to art history, but most have prescribed some combination of semantic content such as form and shape and concepts represented such as themes and allegories, later broken down further into more sophisticated facets for description (Enser, 2008b). The relationship which has arisen between these theories for description and professional practice, however, is described again by Enser (2008a) as two separate communities working towards similar goals—i.e., effective description and retrieval given semantic limitations—but with very little communication and engagement across both sides of this gap. The barriers which exist between image and text, theory and practice, or concept and content, are complicated further as one begins to unravel the ways in which language bias, the construction of expertise in the field, and Western interpretation have influenced the practice of describing and providing subject access for retrieval to images with complex meanings, and which represent a physicality that is tightly bound to shifting and community-based epistemologies.

1.2.2 Problem statement.

Rossetti (2013) described the indexing of subjects of art images as “unmanageable” (p. 286) given the desire of many institutions to cut costs and avoid accumulating uncatalogued resources, which can be an issue when considering the time and labor required to describe and index images for digitization projects. The author, writing from the Getty Research Institute, asserted that subject access is a necessity for art images, albeit one that has been neglected by most institutions (Rossetti, 2013). Artstor, the largest collection of digital images, aggregates images and metadata from a wide range of institutions with differing cataloguing practices; the result, Rossetti found, is that Artstor provided less than ideal subject access and even subpar image retrieval given the lack of consistent, in-depth description and indexing (2013). Given the ubiquity of Library of Congress Subject Headings in many library catalogues, this lack of subject access in a repository of Artstor’s size might be shocking

to those in the LIS field, although according to Zavalina (2012), providing adequate subject access to users is an issue that plagues many catalogues and databases other than Artstor.

Despite this ubiquity and utility, the library and information studies community has recognized for several decades that knowledge organization systems such as Library of Congress Subject Headings (LCSH) reflect the biases implicit in Western society; Sanford Berman first published *Prejudices and Antipathies* in 1971, wherein they led the charge against the problematic and inaccurate usage of language in subject headings, which prioritized white, Western, heterosexual, cisgender masculinity (1993). Berman charged that “just because the scheme germinated, historically with a Western framework of late Victorianism, rampant industrial expansion, and feverish empire-building (with its White Man’s burden rationale)—just because, in short, we were ‘brought up that way’ is no valid reason for perpetuating, either in our crania or our catalogues, the humanity-degrading, intellect-constricting rubbish that litters the LC list” (1993, p. 16).

In a system which relies on language to offer users access to information, language itself is therefore of profound importance, particularly when materials such as images cannot “speak” for themselves and do not present the cataloguer with their own language and subject matter. According to Littletree and Metoyer, “words, chosen carefully and mindfully, convey the mental, spiritual, social, and physical aspects of the world around us” (2015, p. 640) and therefore are of the utmost importance when understanding Indigenous knowledge systems.

1.3 Definition and Explanation of Terms

1.3.1 Indigenous knowledge.

Attempts to define the term “Indigenous” abound; for the purpose of this study, however, it is important to note that definitions of Indigenous or traditional knowledge are equally elusive. Duarte and Belarde-Lewis phrased this most effectively by stating:

There are over 600 distinct tribes within U.S. political borders alone, each one representing unique epistemologies, ways of knowing, languages, and histories. In 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. But in the contemporary moment, this is not the case. Thus, while it is not easy to imagine how even a single Indigenous knowledge organization system emerges, Indigenous knowledge organization systems also represent an integral theoretical question for information professionals serving Indigenous communities. (2015, p. 678)

Given this multiplicity of knowledge, the use of the term “Indigenous knowledge” in this study is something of a conceit or contrivance; it allows the author to refer to something or somethings that are important to address in LIS literature and professional practice, but are under-recognized. In particular, collections of Indigenous visual culture from the United States and Canada will be considered in this study.

1.3.2 Visual culture.

The choice to refer to images of Indigenous subjects or objects as visual culture is one that is of profound importance. Much of the literature around image description takes a narrow view of what types of content can be captured in an image and described in the setting of a library or museum, and focuses of the process of describing art images. Carolyn Dean pointed out that calling objects from

non-Western communities “art” or “primitive art” imposes epistemological assumptions on those objects when, in many cases, they were created in places that do not have a concept of art while giving superiority to Western conceptions of the visual (2013). The term visual culture, in this study, therefore refers to images of culturally relevant objects or photographs of Indigenous subjects. For the purposes of this study, this is also distinct from (though very strongly linked to) the work of modern and contemporary Indigenous artists, who use traditional imagery while also engaging in Western art-making practices and/or with the intention of making art, operating within and often disrupting Western epistemological assumptions of art-making.

1.3.3 Decolonization.

Many of the efforts to reveal colonial bias in knowledge organization systems or collaborate with Indigenous communities have been described as decolonization. Tuck and Yang (2012), however, warned that much of the discourse around decolonization makes “no mention of Indigenous peoples, our/their struggles for the recognition of our/their sovereignty, or the contributions of Indigenous intellectuals and activists to theories and frameworks of decolonization” (p. 2). While it may be that certain institutional efforts clearly fall short of this vision of decolonization, the purpose of this study is not to engage with decolonization in a superficial way or to accept “decolonization initiatives” or Indigenous-inclusive programming without skepticism. For the purposes of the quantitative aspect of this study, cultural heritage institutions’ “decolonization initiatives” were initially coded to include activities that insert Indigenous voices into institutional contexts, but will not be referred to as such in this paper. Ultimately, whether these programs constitute what Franz Fanon referred to as, “a program of complete disorder” (1963, p. 36) is not to be dismissed offhand, but ultimately these value judgements require more time and involvement than this study offer, and likely more cultural experience than the author possesses. For more information about the author’s consideration of this subject, see section 4.3.

1.3.4 Appropriateness and inappropriateness of language.

As Doyle, Lawson, and Dupont (2015) pointed out, the development of an authority file for names of First Nations requires an understanding of historical precedents and contentiousness regarding naming, and the author acknowledges that the matter of language in an Indigenous context can be contested and complex because of interactions with colonizers. Ultimately, the task of determining whether the language of image subject headings is appropriate or appropriative is not necessarily for the author to determine; however, for the purposes of this study it is important to attempt to identify language that is inaccurate or culturally insensitive in order to underscore language bias in image cataloguing practice. It is important, though, that the author stresses that the nature of language in this context is contested and that it is not the purpose of this paper to resolve this or erase ongoing conversations regarding naming and language, particularly as describing translating concepts in English can be difficult due to communities' language loss, the shortcomings of English in conveying notions such as interrelatedness of concepts, and the discrepancies which may exist between Indigenous languages and cultures and the ways that they are recorded formally in English or French in government regulations or in documentation of cultural heritage institutions (Lawson, 2004).

1.4 Research Questions

How do institutions describe images of Indigenous visual culture in their digital collections? To what extent do they follow cultural heritage “best practices” and standards when it comes to resolving the innate semantic and/or ethical issues surrounding image subject access? Does this differ depending on the type of institution, image content, or size of the collection?

1.5 Scope of the Study and Limitations

The results of this study are not generalizable beyond cultural heritage institutions in Canada and the United States and their holdings of Indigenous visual culture; it is not intended that inferences be

made regarding the knowledge organization of other groups with histories that have been ignored, revised, or erased by cultural heritage institutions and information professionals. Additionally, given the limited range of institutions consulted and multiplicity of Indigenous knowledge systems, the generalizability of this study should not be overstated. Additional topics outside the scope of this study are listed below.

1.5.1 Additional ethical issues.

The “ethical issues” described in this study are focused specifically on the historical biases present in knowledge organization systems and the way in which they efface and interact with Indigenous knowledge and visual culture through the use of cataloguing and indexing languages. Although the issue of access will be discussed in section 2.2.3, the ethical implications associated with traditional knowledge organization, digital libraries, and Indigenous knowledge are multifarious, ranging from issues with copyright, the idea of ownership, and the public domain. In particular, the author would like to address that access to cultural knowledge and protocols which restrict and protect Indigenous knowledge are important to any discussion of Indigenous knowledge (Lawson, 2004; Brown & Nicholas, 2012; Younging, 2016), but gathering data on this topic is outside of the scope of the current study.

1.5.2 Other cataloguing and knowledge organization biases.

Berman identified a multiplicity of biases which exist in the Library of Congress Subject Headings, and many more have been revealed in the years since the publication of *Prejudices and Antipathies* (1993). Unfortunately, Indigenous communities are not the only groups marginalized, and in many cases these cataloguing biases intersect with each other, such as through terms involving gender, race, or sexuality (Berman, 1993; Olson, 2002). Additionally, Doyle, Lawson, and Dupont (2015) pointed out that other library knowledge organization systems such as Library of Congress Call Numbers

physically arrange knowledge in a way that is deeply problematic and inaccurate. While these issues are indicative of larger issues in LIS knowledge organization systems and their treatment of Indigenous knowledge, physical organization such as the use of call numbers are outside the scope of this study.

1.5.3 User behavior and information seeking.

Although it is difficult to separate image description from user queries given the amount of literature which combines both of these topics—indeed, section 2.4.2 discusses user-centered description models—the current study focuses exclusively on cataloguer behavior rather than user behavior during search and retrieval. The focus, rather, is on whether description models and the personnel and institutions which apply them in practice accurately and appropriately describe the subject matter of an image, and whether that also includes language and description which reflects Indigenous knowledge and understandings of visual culture. Once this is ascertained, exploring whether description models can provide effective access and retrieval for users while mirroring the knowledge of the originating culture is an opportunity for future study.

1.5.4 Archival description.

For the purpose of this thesis, archival description has not been included in the review of the literature or the collection of data. This is partially because description in the archival sense is “based on this contextual research rather than on an examination of the physical records themselves. [...] Archival records are not usually classified by subject since the records are not really ‘about’ subjects” (Timms, 2009, p. 74). Because this study addresses subject access and organization, archival description falls outside the scope of the current study. Additionally, many of the libraries selected for study also include their archival holdings and some participants consulted are archivists. However, no stand-

alone archives or archives associated with historical societies or bodies besides libraries are included in this study.

1.5.5 Other cataloguing activities and metadata schema.

This study focuses specifically on descriptive fields which provide subject access to images. This does not include other descriptive fields such as title, creator, classification, or physical characteristics. Additionally, this study does not cover metadata schema used to describe images such as Visual Resource Association (VRA) Core, Categories for the Description of Works of Art (CDWA), MACHine Readable Cataloguing (MARC), or Dublin Core. Additionally, while libraries and museums may employ different content management systems or integrated library systems which may influence the manner in which objects are described, they also are outside the scope of this study. It should be noted, therefore, that labels for descriptive fields may differ depending on the metadata schema or CMS/ILS used. The ability for these systems to enable retrieval and discovery will not be explored.

1.5.6 The role of the digitizer.

Conway (2009) identified the crucial role that the digitizer and the final product of digitization play in constructing the meaning of images. Workflows, scanning hardware and software, and image manipulation can have a striking effect of the transformation of a material object into the digital information which constitutes an image that a cataloguer must then describe, which then can fundamentally alter how users retrieve and interact with that image; Conway linked this to Bolter and Grusin's concept of remediation, in which analog media are re-presented in a multiplicity of new media and technologies (Conway, 2009). While the process of converting Indigenous visual culture into two-dimensional digital images, which are processed according to certain workflows, has bearing

on the image's meaning, the effects of the digitization process on meaning are outside the scope of the current study.

1.5.7 Data gathering limitations.

The limitations of the data gathered will be discussed in more detail in chapters three and four; however, limitations were experienced in all three stages of data gathering: image metadata, institutional websites, and surveys. Image metadata content analysis was limited by libraries and museums with online collections in Artstor or the Digital Public Library of America, by the keywords used and other search parameters. Additionally, this step was limited by the metadata made publicly available by institutions in these repositories, and by the impossibility of fully characterizing the population of libraries and museums with Indigenous visual culture collections and the sizes of these collections. Similarly, institutional content analysis was limited by what information about the institution's activities and partnerships was available online. Finally, due to the manner in which respondents from case studies were contacted, all participants are full-time staff members with several years of cataloguing experience; responses therefore do not include volunteer, part time, or student employees.

2. Literature Review

2.1 Introduction

This chapter begins by examining the nature of Indigenous knowledge and the role of visual culture in its creation and transmission, pointing out the ways in which this is undermined, misrepresented, and misunderstood by Western epistemologies. This includes a discussion on ethnographic photography and the depiction of Indigenous subjects, dress, and/or rituals in these photographs. Following this, a discussion of the history of the often-fraught relationship between Indigenous communities and cultural heritage institutions is framed by the literature, which prescribes collaborative efforts in digital collection creation and aims to bridge the gap between information professionals and Indigenous communities.

Once this has been introduced, the work of art historian Erwin Panofsky provides a framework for analyzing the subject matter of an image, which is reflected in the image indexing models of authors such as Shatford, Markey, and Jørgensen. Other models for image description, such as content-based image retrieval and user-centered studies, offer alternatives to this traditionalist approach, but best standards documents such as the *Cataloguing Cultural Objects* guide appear to return to the *Ofness* and *Aboutness* model (Baca, Harpring, Lanzi, McRae, & Whiteside, 2006). These documents refer to specific controlled vocabularies for images, such as the Getty Art and Architecture Thesaurus, the Library of Congress Thesaurus of Graphic Materials, and others. Other types of description, such as the First Nations House of Learning Subject Headings, free text, and crowd-sourced or folksonomic description are investigated as methods for providing subject access to images. Finally, the review returns to cultural heritage institutions to investigate the ways in which cataloguing processes may affect subject access for collections, as well as how this affects collaborative efforts between libraries and museums.

2.2 Indigenous Knowledge and Visual Culture

2.2.1 About Indigenous knowledge.

To begin a conversation about the role of material culture in Indigenous knowledge systems, it is necessary to investigate the nature of that knowledge itself. Peters (2016), a native Hawaiian author, described it as an “ecological reconceptualization of the complexity of interrelationship and the nature of being” (p. 37). This concept of interconnectedness reveals the relationships between all things, including: living/dead, tangible/intangible, sentient/non-sentient, animate/inanimate (Peters, 2016). Cultural knowledge is something that is passed between generations and is present in and gained from lived experience; Peters (2016) described this as the “embodiment” (p. 26) of knowledge, wherein ceremony, ritual, and oral traditions constitute knowledge that is as dynamic and alive as the landscape it is connected to. Roy, Hogan, and Lilley echoed this conceptualization of Indigenous knowledge in their description of the Indigenous “worldview” (2012, p. 176), which emphasizes the connection between generations through oral histories and a strong relationship to the lived environment. Additionally, Lawson (2004) distinguished knowledge and information according to Indigenous information professionals as something internalized, holistic, experiential, and connected to the spiritual and emotional as opposed to unprocessed, fragmentary information. Indeed, “many things that a Western worldview identifies as distinct and separate elements of culture such as spirituality, family and relationship with the land are seen by First Nations elders as inseparable from their whole culture” (Lawson, 2004, p. 38).

According to Roy, Hogan, and Lilley (2012), expressions of Indigenous culture and knowledge “include dance, song, stories, oral accounts” (p. 169) as well as the text- and image-based recordings and representations of these activities. Peters (2016) also described the visual culture used in cultural expressions; for example, the dress worn by practitioners of hula represent their “full and complete understanding about the properties of the materials used and knowledge about the specific

environments in which their materials can be found and gathered – the ocean, mountains, wetlands, etc.” (p. 32). Therefore, this garb and the tools used during the enactment of rituals are integral in transmitting and activating oral and ceremonial traditions which connect members of the community to each other and the landscape, both storing and spurring cultural knowledge (Brown & Nicholas, 2012).

Peters (2016) pointed out that although Indigenous peoples have differing methods of transmitting and storing cultural knowledge, many of them use ceremony and ritual for both spiritual and practical reasons, chief of which is their pedagogical utility. According to Younging (2016), the rules and customs that govern the transmission of this cumulative and socially-generated knowledge have largely been ignored by Western jurisprudence; thusly decontextualized and unprotected under Western regimes, Indigenous knowledge is vulnerable to exploitation.

Indeed, Indigenous epistemologies have been misunderstood and decontextualized by Western civilization, and “Western literature has alleged that Indigenous knowledge represents concepts that are anecdotal, primitive, prescientific, or even ignorant in contrast to Western knowledge that has resulted from the scientific and empirical methods and linear conceptualizations” (Peters, 2016, p. 28). On the contrary, Indigenous knowledge has been developed and passed down for millennia, and is present in and activated by the people themselves; this knowledge and its embodiment may not mirror Western information repositories such as libraries, but is integral in the connections between people and their lived environment (Peters, 2016). According to Brown and Nicholas (2012), the interconnectedness of people, the environment, and the objects that they create “could be thought of as cultural databases in themselves that enable, and are enlivened by, interpersonal social networks” (p. 310). For this reason, the separation of cultural and intellectual property is incompatible Indigenous epistemologies; the past, present, and future are bound in the objects that they create and the knowledge that is contained therein (Brown & Nicholas, 2012).

2.2.2 Historical precedent.

In their call for librarian support of Indigenous cultural knowledge and agency, Roy, Hogan, and Lilley (2012) investigated the ways in which, historically, privilege given to Western ways of knowing in places like North America has affected the relationships between heritage institutions and Indigenous peoples. According to the authors, the appropriation of sacred objects gained through theft or other dubious circumstances since the nineteenth century have decontextualized Indigenous knowledge and prevented the agency and access of Indigenous groups; furthermore, this loss of cultural information is an extension of the extermination or removal of Indigenous peoples from native-held lands perpetrated by white colonizers (Roy, Hogan, & Lilley, 2012).

Most importantly for this study, the authors then asserted that the “technical processes including archival processing, cataloguing, exhibits management and labeling were used to describe and arrange collections of cultural material in ways that mirrored Western thought” (Roy, Hogan, & Lilley, 2012, p. 174). Academic fields such as anthropology encouraged the collection and decontextualization of Indigenous “artifacts” in the name of academic study; although these collections gave researchers access to Indigenous culture, they removed it from its context and from the people capable of transmitting and activating it for their own purposes or the purposes of their communities (Roy, Hogan, & Lilley, 2012).

The early history of anthropological study also demonstrates the biases and suppositions exhibited in ethnographic photography, particularly in the United States and Canada; indeed, into the early twentieth century photography was “a weapon in the final skirmishes of cultural warfare in which the natives of North America could be properly and finally embedded in their place in the cultural evolutionary incline” (Deloria, 1982, p. 11). According to Payne and Thomas (2002), the practice of

measuring racial variation by early ethnographers is defined by its use of tools, from measuring tapes and calipers, to tools meant for reproduction, namely cameras. Cultural biases of colonists were inscribed in these seemingly scientific tools, supporting racial theories based on the superiority of white settlers (Payne & Thomas, 2002). The practice of anthropometric photography, which was used to make visual records of Indigenous subjects in a standardized style, supported racial stereotypes about Indigenous peoples based on systems of measurement and classification (Lyman, 1982).

Edward Curtis's photographic and ethnographic project, *The North American Indian*, combined the aesthetic underpinnings of the photo secessionist movement with the scientific and technological verisimilitude of photography (Lyman, 1982; Payne & Thomas, 2002). Although many other photographers of the nineteenth and twentieth centuries depicted Indigenous subjects as a form of documentary evidence to support the cultural and political practices of settler colonialism, Curtis's work is notable for the ways in which he "employed ethnography as an authoritative voice, while using photography to tell a fictional story" (Payne & Thomas, 2002, p. 116). The story that Curtis told through his photography was one of an essentialist "Indianness" which was predicated on a perception of Indigenous subjects as *Other*; Curtis achieved this by manipulating images, either through staging or through technical processes such as cropping in the darkroom, in order to remove traces of "Whiteness" such as clocks (Lyman, 1982).

However, while it is clear "that the subjectivity and agency of these Native men, women, and children was mediated and transformed by the collaborative ethnographic text" (Zamir, 2014, p. 10), it is important to note the ways in which these depictions of Indigenous subjects were sites of resistance and "enabled Amerindian agency to emerge through a physical dialogue" (Paakspuu, 2016, p. 314). Indeed, an Indigenous reading of Curtis's photographs and recording of a sacred Navajo ceremony revealed that in order to secularize the dance, it was performed in reverse unbeknownst to him (Lyman, 1982). Although contemporary readings of these photographs by Indigenous subjects reveals

their ability to resist settler colonialist epistemologies, the work of Curtis and others, as intended for non-Indigenous audiences, sought to circumscribe these peoples and scenes within technology meant to convey a “truth” that served and reinforced settler colonialist dominance and racial superiority (Lyman, 1982; Payne & Thomas, 2002; Paakspuu, 2016).

In their discussion of digital preservation under the *UNESCO Charter on the Preservation of Digital Heritage*, de Lusenet asked: “Can a cultural process or an event that is continually recreated actually be safeguarded without ‘fossilizing’ it?” (2007, p. 176). Although this question was being asked of digital events and processes, it could also be asked of Indigenous oral traditions and ceremonies and their capture on film or in an object record. The process of collecting, cataloguing, and exhibiting—the kind of “safeguarding” that cultural heritage institutions engage in—the material culture and the knowledge that it embodies is, in effect, fossilized. Contrary to Peters’s notion of the “embodied library” (2016) of Indigenous knowledge, traditional practices of description and display are, in effect, disembodied. Thusly circumscribed within the traditional limitations of knowledge organization, Indigenous visual culture was both literally and metaphorically placed in boxes and permitted to gather dust as researchers provided analysis and interpretation for Western discourses intent on what Peters describes as “cognitive imperialism” (2016, p. 38).

Turner (2015) provided an in-depth history of the cataloguing of Native American materials at the Smithsonian National Museum of Natural History (NMNH). Turner identified the unique role of museum object description in the history of cataloguing bias, given the ad hoc nature of description practices, and posited that “no two museums are alike in their classification of Indigenous heritage. Nomenclatures and naming practices are therefore deeply connected to the history and development of each individual institution” (2015, p. 661). In the case of the NMNH, Indigenous knowledge was treated as the object of natural history research rather than as a valid contribution to it in the face of Western research methods. Linda Tuhiwai Smith asserted that Western positivist research methods

“bring to bear, on any study of Indigenous peoples, a cultural orientation, a set of values, a different conceptualization of such things as time, space and subjectivity, different and competing theories of knowledge, highly specialized language, and structures of power” (2012, p. 92)

2.2.3 Access to knowledge in cultural heritage institutions.

The notion of “access” as it pertains to Indigenous knowledge and its presence in cultural heritage institutions is multipronged: first, there is the access denied to cultural objects when they are removed from communities and placed in cultural heritage institutions; secondly, there is the access that must be curtailed as digital collections of images represent sacred objects or ceremonies to audiences that do not have the knowledge to view or interact with them; and finally, subject access determines the way that images are grouped together, an arrangement which in itself produces meaning between those images. Although these uses for the term “access” signify highly specific issues, they all point to a common concern: restricting who may interact with these images (and the objects they represent) and the way in which that interaction is mediated by knowledge organization.

This practice of preventing access of visual culture and privileging Western ways of knowing over Indigenous authorship and understanding equates to a cultural imperialism which “supports, in turn, land and governance-based imperialism” (Roy, Hogan, & Lilley, 2012, p. 170). As discussed above, the very idea of ownership of Indigenous visual culture by cultural heritage institutions is a site of contestation and enables information professionals to assume responsibility for providing access to parts of their collections, often restricting access to native peoples (Roy, Hogan, & Lilley, 2012). Western paradigms regarding individual ownership are in direct opposition to the emphasis on community and group rights in Indigenous epistemologies, and as the manifestations of Western values—including the paradigms of freedom, access, and individuality—libraries have, again,

historically been spaces that have undervalued and often harmed Indigenous communities (Roy, Hogan, & Lilley, 2012; Brown & Nicholas, 2012; Younging, 2016).

The result of this cultural imperialism by heritage institutions is the loss of ancestral and cumulative knowledge, commodification of sacred imagery and stories, and misuse of the religio-political symbolism that could be dangerous to the unknowledgeable (Brown & Nicholas, 2012). This is particularly potent given the rise of technologies that allow increased availability of library and museum collections to anyone with internet connectivity; access to and control over cultural knowledge, then, is even more removed from Indigenous communities. The concept of openness and reliance on materials in the public domain for building digital collections privileges Western individualism and has brought Indigenous cultural knowledge to audiences that may misinterpret or misappropriate it (Brown & Nicholas, 2012; Younging 2016). Additionally, allowing any user to access Indigenous visual culture and the knowledge that it embodies is often against the sets of customs and rules that govern its use; Younging (2016) identified several cultural objects that may be sensitive or prohibited from the uninitiated including sacred objects or objects that are significant spiritually. As Brown and Nicholas pointed out, for some Indigenous groups, copies or photographs made of sacred object possess the same potency and embodied knowledge as the original (2012). The rise of digital collections that include images of Indigenous visual culture add additional complexity to the notion of “access”; in this case, access is not just related to ownership, but to the profaning or misappropriating of sacred and significant objects and the cultural knowledge that they activate.

This recolonization of Indigenous visual culture is reflected in the third type of access: subject access, which allows users to navigate the landscape of collections topically. In 1971, Sanford Berman’s publication, *Prejudices and Antipathies*, helped expose the types of biases that exist in the Library of Congress Subject Headings. Berman described the types of people that were satisfied by LCSH’s subject access as “fundamentally loyal to the Established Order, and heavily imbued with the

transcendent, incomparable glory of Western civilization” (1993, p. 15). Indeed, Doyle, Lawson, and Dupont (2015) pointed out that much of the existing systems for ordering knowledge in libraries reflected the biases and epistemologies of settler colonialism of the 19th century, the result of which is a lack of relevance, specificity, and acknowledgement of sovereign nations in conjunction with the erasure of certain knowledge in favor of Western narratives regarding native peoples. Webster and Doyle (2008) described the ways in which classification systems encourage information professionals to think of Indigenous materials from the perspective of a culture outside of that which it was created for, and furthermore a perspective which perpetuates Western paradigms and “systemic biases” (p. 191), the result of which is decreased accuracy in retrieval for information seekers. While it is important that information professionals acknowledge that classification schemes, subject heading systems, and thesauri are social constructs (Doyle, Lawson, & Dupont, 2015; Farnel, 2017), for Indigenous communities, the stakes are much higher, and the reversal of cognitive and cultural imperialism in cultural heritage institutions must include “sovereign authority over the right to name and claim their own identities, definitions, traditional knowledge, and cultural practice” (Peters, 2016, p. 38).

2.2.4 Collaboration and understanding for developing digital collections.

Perhaps unsurprisingly, much, if not all, of the recent literature that discusses the place of Indigenous knowledge in cultural heritage institutions advocates for collaboration with Indigenous communities to create policies, initiatives, and knowledge organization systems that reflect the dynamic and group-oriented nature of Indigenous knowledge while acknowledging its fraught history with these institutions. Peters (2016) asserted that in order to honor these sacred objects and the people that have imbued them with their knowledge, digital libraries and the information professionals that develop their policies must allow Indigenous peoples to exert agency and sovereignty over their own intellectual property. Although poorly developed digital libraries can misuse and decontextualize

Indigenous knowledge for the sake of open access, authors engaged in development of Indigenous digital libraries stated that the fluidity of digital collections and their collection development policies make it possible to accommodate the needs for Indigenous groups to control access to their visual culture (Brown & Nicholas, 2012; Pasaribu, 2016).

According to Brown and Nicholas (2012), especially successful have been digital collections that encourage community members to provide firsthand interpretation of collections; in some cases, creating databases where Indigenous communities retain control over access to information but allow people to collaborate, interact, and “reinststate the original role of the cultural object as a generator, rather than an artefact, of cultural information and interpretation for the benefit of communities and research teams” (p. 313). Collections which take advantage of existing social exchanges online and which permit folksonomic description by Indigenous users can begin to allow for the type of community-oriented knowledge creation and transmission that much of this visual culture was intended for (Brown & Nicholas, 2012).

Initiatives to create respectful and culturally sensitive controlled vocabularies such as the First Nations House of Learning subject headings or the Mashantucket Pequot Thesaurus help to foster relationships between cultural heritage institutions, Indigenous communities, and users (Doyle, Lawson, & Dupont, 2015; Littletree & Metoyer, 2015). This helps Indigenous community members see themselves represented in library spaces in a way that is not offensive, stereotypical, or inaccurate, and builds trust between communities and libraries; additionally, the public availability of these tools means that “First Nations community knowledge centres can copy the metadata to use or adapt to their own needs” (Doyle, Lawson, & Dupont, 2015, p. 120).

Pasaribu (2016) and Brown and Nicholas (2012) pointed to cultural mapping projects and collections which integrate GIS mapping as ways in which landscapes can once again be connected to the people,

ceremonies, and sacred objects that embody and convey Indigenous knowledge. Brown and Nicholas pointed out that “the integrity of the information provided by these cultural maps is not determined by its completeness, in an academic sense, but by its ability to undergo further development under appropriate cultural property protections” (2012, p. 318). Indeed, eschewing the value of completeness “in an academic sense”—or in Western paradigms—in favor of dynamic and appropriate development of knowledge is an important step towards preventing further fossilization of visual culture and the recolonization of Indigenous knowledge under knowledge organization systems.

Duarte and Belarde-Lewis pointed out that effective decolonization projects must accept two important points: first, that knowledge is not only contained in documents; and second, that Indigenous knowledge and visual culture may not belong in academic settings or heritage institutions (2015). Indeed, Brown and Nicholas asserted that the notion of digital repatriation may be serviceable through collaborative collections, these “are never quite the same as having the objects within their context of origin. Time estranges people from the institutionalized objects that were once part of their communities, and the opportunity to reinstate the personal relationships between people and their cultural treasures diminishes as it passes” (2012, p. 314).

Although the collaborative projects above describe optimistic or ideal ways to work with Indigenous partners in light of the cultural biases that exist within library and museum cataloguing practices, in order to understand how this compares or contrasts to image description practices, the proceeding sections turns to LIS models for cataloguing, indexing, and describing images and visual depictions of digital surrogates of objects.

2.3 Panofsky and Iconography

In order to understand much of the literature surrounding LIS image description and indexing, it is necessary to first investigate the works of Erwin Panofsky, a prominent twentieth century art historian and author of *Studies in Iconology*. Originally published in 1939, the book explored the topic of humanism in the art of the Italian Renaissance, but is perhaps best known for its introductory methodological chapter, which details Panofsky's three-tiered approach for conducting art historical research, a practice that he referred to as iconology (1962). He began by defining iconography as "that branch of the history of art which concerns itself with the subject matter or meaning of works of art, as opposed to their form" (Panofsky, 1962, p. 3), which he then separated from iconology, a form of analysis and interpretation which only the successful art historian could intuit based on his knowledge of the work's sociocultural context. These three strata of deriving meaning from images form the basis of his methodology and, decades later, would form the LIS framework for indexing images.

Panofsky described his first level of subject matter as "pre-iconographical" (1962, p. 5), because it includes the identification of forms present in the image; that is to say, the way in which lines, shapes, and colors work together to produce objects that are recognizable to the viewer. Panofsky pointed out that conducting pre-iconographical analysis on its own, without any form of deeper knowledge or investigation, is impossible (1962). While viewers of images may attempt to look at pure forms, "we really read 'what we see' according to the manner in which *objects* and *events* were expressed by *forms under varying historical conditions*" (Panofsky, 1962, p. 11). Therefore, the way in which we understand forms as representative of objects in the world is based not only on our practical experience, but also on the way in which those forms were expressed at the time they were depicted.

Panofsky described his second strata of meaning as the connection of forms to the themes or concepts that they represent, such as in the depiction of scenes or allegories (1962). Formal analysis is

incredibly important for successful iconographical analysis, which accepts the identification of forms in order to correctly connect them to concepts. Additionally, iconographical analysis necessitates a familiarity with the literary sources that the image evokes; also necessary is “insight into the manner in which, under varying historical conditions, specific *themes* or *concepts* were expressed by *objects* and *events*” (Panofsky, 1962, p. 15). Winget (2009) also pointed out that this level of analysis requires the art historian to determine the relevant and irrelevant forms in a painting based on their knowledge of the literature and stories transmitted through the work.

The third level of meaning is described by Panofsky as its “intrinsic meaning or content” (1962, p. 7), wherein the intentions of the artist and values of the society in which they work are subconsciously infused into works. As such, the forms the artist chooses to depict concepts or allegories are profoundly impacted by their contemporary attitudes, beliefs, and social structures, requiring art historical synthesis and deep understanding in order to uncover intrinsic meaning (Panofsky, 1962). Panofsky finally posited that the work of uncovering intrinsic meaning from form and allegory is shared with the other humanities disciplines; that just as the art historian may draw on the politics, religion, and social structures to derive meaning, so too may scholars in these disciplines derive meaning from works of art (1962). This framework, therefore, places the ability to interpret images on the shoulders of the art historian, who owes their ability to intuit intrinsic meaning to a great deal of expertise across disciplines.

2.3.1 Analysis of Panofsky’s methodology.

In their discussion of subject access for art images, Winget (2009) connected Panofsky’s work, with its emphasis on connecting forms to allegorical meaning, to the field of semiotics and the work of Umberto Eco, which posited that meaning is constituted by signs which link “actors in a culture and cultural artifacts” (p. 959). This form of analysis works for “reading” images that have static

meanings or which mimic the narrative elements of text, but according to Winget, this becomes a problem for “images or artifacts that are either non-narrative or non-representative, or for art that was not created within the Western tradition” (2009, p. 961). Indeed, Winget (2009) cited Svetlana Alpers as a critic of Panofsky’s model, pointing out its bias toward interpreting works in the tradition of Italian Renaissance painting, and its marginalization of more “primitive” works, such as those originating from non-Western cultures, as well as photography and nonrepresentational art (Winget, 2009).

Futhermore, Winget discussed Gombrich’s critique of Panofsky’s formalist method of interpretation, which they described as a form of “essentialism” (2009, p. 968) that translated a single work into the consciousness of an entire race or era. Winget (2009) posited: “imagine the formalist-based art historical interpretations of any non-Western art traditions with such a basis for interpretation” (2009, p. 968). It is not difficult to imagine that such an interpretation, much like the outmoded classification systems used to describe Indigenous materials in libraries, would be more indicative of the art historian’s Western epistemology rather than the knowledge system that produced the image. Imposing a framework which presupposes static, time- and narrative-based meaning on images or visual culture that is intended to be dynamic and to connect past, future, and present once again fossilizes works much in the same way as traditional cataloguing practices.

2.4. Image Content and Description Models

Since the publication of Panofsky’s iconographical methodologies, LIS scholars have assumed the mantle of subject matter description to allow users to access images according to their subject.

Although these authors have approached image description from user-centered and concept-based perspectives, the means in which many of these models are framed have shared assumptions that trace back to Panofsky, particularly through the work of Shatford.

2.4.1 Panofskian models for image description.

2.4.1.1 Markey's subject access matrix (1988).

Karen Markey's 1988 article, "Access to Iconographical Research Collections" clearly drew upon Panofsky's iconographical method for "reading" images. Markey argued that indexing according to this method supported retrieval for iconographical research collections, which were likely to be accessed by users trained and knowledgeable in art history, medieval studies, and theology; however, users without special training would also be able to access images based on the primary subject indexing, or the pre-iconographical analysis (Markey, 1988). Markey claimed that all art historians, regardless of their methodological approach—iconographical or otherwise—would require the following information about the image: date of creation, its provenance and travels, creator, medium, and the primary function of the artwork. Markey found that subject access for iconographical research collections supported only secondary subject matter, which they suggested was due to the cost of having multiple subject entries for card- or microform-based collections; furthermore, because these collections were created for scholars engaging in this type of research, subject access should reflect their knowledge and expertise (1988).

Markey proposed a matrix for providing subject access in machine-readable form, which separated primary and secondary subject matter into three principal methods of subject access and four indexing techniques (Markey, 1988, p. 158). Markey then applied this matrix to several collections of iconographical research images and found the following: they were firmly planted in the field of art history and in the hands of art historians; they used subject headings and classification schemes for providing subject access; primary subject matter was not described; and automation of indexing was not wide-spread and, in cases where it did exist, utilized keyword searching for secondary subject matter (1988). Markey asserted that this lack of primary subject matter indexing would pose a

significant barrier to non-expert users, and that technological shifts toward automation of indexing—or rather, machine-readable indexing—would enable collections to provide increased primary subject access points for users (1988).

However, Markey identified the lack of consistency across collections as an additional barrier to access for users, particularly where subject authority files were not readily available to aid in the search, or where certain controlled vocabularies—such as Iconclass—were specifically tailored toward describing the “style(s), historical period(s), and/or geographical area(s)” (Markey, 1988, p. 171) of the collections around which these subject heading systems originally were developed. Markey supported the idea of a centralized format and vocabulary for describing images in order to promote the sharing of data across institutions and to take the onus of effective retrieval off of users and onto databases (1988).

2.4.1.2 Shatford's generic-specific model (1986).

Shatford turned to the basic concepts and principles that determined how and which thesauri and subject heading systems were applied for image description, focusing on how these concepts could enable users' retrieval of representative pictures, which the author described as “photographs, drawings, paintings, slides, prints, or any relatively two-dimensional, static item containing information in the form of a representational image or images” (Shatford, 1986, p. 39). The author first identified the disparate and often subject-specific uses of images, then turned to Panofsky for an explanation of meaning in a picture; most notably, the author transformed the primary and secondary levels of subject matter into two types of description: what the image is *Of*, and what the image is *About* (Shatford, 1986). Although Shatford determined that the tertiary level of description, or iconological interpretation, is not intended for indexing, they echoed Panofsky by suggesting that this

level of synthesis is not possible without effective and accurate primary and secondary subject matter identification (1986).

Shatford then separated these two levels of description into generic description and specific description; indicating that *Of*ness can either be the generic description of objects or activities, or can provide “specific, or proper, appellation of those objects and events. *Of* words describe people, places, objects, conditions, and actions that have a physical manifestation” (1986, p. 45). Generic *About* description, then, refers to the overall effect of the picture, while specific description of this kind refers to particular symbols, concepts, or creatures (Shatford, 1986). Shatford then asserted that nonrepresentational artworks could not be described using *Of* description, but that all pictures are “simultaneously generic and specific” (1986, p. 47). The author finished this investigation of generic and specific image description by identifying four possible facets for providing subject access: generic *Of*, specific *Of*, generic *About*, and specific *About*; these subject terms may arise organically by asking oneself who, what, where, and when (Shatford, 1986).

In addition to discussing the ways in which one may describe an image, Shatford also provided a framework for effective indexing of description in order to facilitate retrieval (1986). Among the concerns to be considered included user needs, intended purpose, field or discipline, and level of user expertise; Shatford did contend that for general collections, “an alphabetico-classed arrangement based on *Generic Of* (or, perhaps, *About*), and subarranged by *Specific Of*, seems most likely to satisfy user needs” (1986, p. 56). Shatford warned against completely eschewing *About* analysis in favor of *Of* subject access, and contended that subjective analysis and indexer expertise were likely to affect consistency but were still valuable access points for users regardless, particularly for small collections with highly specific subject matter and user groups (Shatford, 1986). The author finished their principles for indexers by advocating for “thresholds of detail and pertinence” (Shatford, 1986, p. 59) which account for user expectations, collection contents, and image content.

2.4.1.3 Shatford Layne's four attributes (1994).

Shatford Layne expanded on their image indexing principles in 1994 by focusing on the indexable parts of an image, and what that indexing should achieve. To the latter point, the author asserted that image indexing should “provide access to images based on the attributes of those images” (Shatford Layne, 1994, p. 583), and that subject access should retrieve useful groups of images instead of a single image. In order to determine what parts of an image should be indexed, Shatford Layne laid out four principle attributes of images: biographical, or creator and provenance; subject, which refers to the author's earlier work regarding *Of/About* and generic/specific description; exemplified, or medium; and relationship, or associated images such as preliminary sketches or even related text-based works (1994).

The author devoted much of their explanation of attributes to subject attributes since they considered it “one of the most problematic and least objective categories, as well as being, frequently, an important one” (Shatford Layne, 1994, p. 584). In their explanation of subject attributes, the author stated that images convey meaning in distinctly different ways than text, and that they do this through symbolic meaning much in the way that semioticians explain the relationship between signifier and signified (Shatford Layne, 1994).

Effective indexing of these four attributes, Shatford Layne asserted, would provide access to useful groups of images which would enable researchers to juxtapose images for comparison and contrast, to help searchers verbalize parts of their query they formerly could not, and to allow users to scan large groups of images rather than using very detailed keyword searches (1994). In determining how this should happen in principle, the author posited that indexing should focus on recall rather than precision to minimize time spent on detailed indexing, and that users would be best served by

retrieval of groups of images based on basic attributes of an image, then augmented by scanning for more specific attributes (Shatford Layne, 1994). The author concluded that these principles should be considered along with the images being indexed, and that certain collections would be better served if certain attributes were indexed over others; the author further suggested that additional quantitative evaluation would provide additional evidence on the efficacy of image indexing (Shatford Layne, 1994).

2.4.2 User-centered models for image description.

2.4.2.1 Collins's pre-iconographical description (1998).

Collins's work examined user queries at the Photographic Archives of the North Carolina Collection and the North Carolina State Archives, and found that many of their image requests described specific components for the image to include. Collins remarked that this is particularly a problem for historical photographs only with collection-level description and for conducting interdisciplinary research wherein an image can have multiple meanings. Bridging this earlier work on user queries with the literature surrounding image indexing principles and models for description, Collins wished to investigate whether existing models and thesauri for image description should include additional pre-iconographical description, whether there are additional image attributes that must be accounted for, and which attributes are most important to index (1998).

The study analyzed user queries to determine their use of certain image attributes to facilitate retrieval, and found that subject terms, both generic and specific, were used more often than other attributes (Collins, 1998). Users in search of historical photographs rarely specified creators or physical specifications such as photographic processes; the only attribute that came close to the frequency of subject term access was the date of the photograph, followed by a specific place (Collins, 1998). Collins seemingly echoed Shatford Layne's conclusion that for general-use

collections, generic subject access is most effective and expedient; for Collins, however, specific *Of* subject access would also facilitate user retrieval (1998). Collins closed by accepting Shatford Layne's assertion that indexing should be dependent on the contents of the collection and the images therein, and added that for large collections of images, collection-level indexing may be the only acceptable method (1998).

2.4.2.2 Jörgensen's image description tasks (1998).

Jörgensen examined whether existing indexing models and thesauri supported description itself, identifying how some of these approaches reveal the tensions produced by the intellectual challenge of converting image to text, creating access points that serve user needs, and the constraints of time and budget for many institutions; consequently, this produced image collections with minimal subject indexing (1998). The author also identified the gap between how users may speak about images in vernacular versus the type of formal language used in many thesauri, and produced a study to uncover the types of language used by non-expert searchers as well as the types of image attributes that were present in that language (Jörgensen, 1998). Participants in the study were asked to describe images while viewing, searching, and remembering them; Jörgensen found that thesauri and subject heading systems such as the Library of Congress Thesaurus of Graphic Materials had little in common with the participants' focus on describing objects, people, colors, locations, and stories (1998). With this study, Jörgensen identified many of the image attributes missing from indexing models, but which might facilitate retrieval for users.

2.4.3 Conceptual models for image description.

Unlike earlier studies that focused on the nature of indexing image subject matter for professionals and reflected on their applicability in light of user queries, the following concept-based models from

image description focus on the ways in which conceptual attributes of images can be extrapolated for indexing.

Jaimés and Chang based their pyramidal indexing model on two categories of attributes: syntax, or observable physical characteristics such as color or texture; and semantics, meaning attributes such as events and objects (2000). Additionally, they differentiated between visual and non-visual information, as well as general and visual concepts (Jaimés & Chang, 2000). The authors used this model to not only bridge some of the issues with content-based retrieval, but to also help the indexer determine what and how to index (Jaimés & Chang, 2000). In contrast to Shatford Layne's *Of and About* model, Jaimés and Chang defined forms and ideas as percept and concept; the former referring to that which senses are capable of perceiving without interpretation, and the latter meaning abstract ideas which are generalizable based on previous knowledge and subjective analysis (2000). In order for this dichotomy to exist between percept and concept, the viewer must accept that perception and conception are separate processes, rather than accept Panofsky's caveat that pre-iconographical identification is impossible; according to Panofsky, analyzing pure forms is always affected firstly by the process that occurs when the eye perceives and the mind resolves that perception into an understanding and identification of an image, and secondly by the ways in which creators use forms to depict objects based on the accepted physical models and visual vocabulary of their era (1962).

Additionally, the authors differentiated between general and visual concepts, a distinction also based on sensory experience (Jaimés & Chang, 2000). From this, Jaimés and Chang began to develop a pyramid for description which separates syntax or percept from semantics or visual concepts, moving from the most basic attributes to the most subjective and abstract (2000). In order of basic to subjective, these levels are: type/technique, global distribution, local structure, global composition, generic objects, generic scene, specific objects, specific scene, abstract objects, abstract scene. As one

moves down the pyramid toward semantic information, more expertise and knowledge is required of the indexer (Benson, 2015).

Jaimes, Chang, Benitez, and Jörgensen tested the effectiveness of this model in 2001 through several experiments in which novice indexers produced formal (full sentences) and informal (words or phrases) descriptions of the images, and a group of trained indexers used structured indexing models and subject terms taken from TGM and AAT. Indexers also indexed images using the pyramid structure, and the authors concluded that the pyramid structure effectively matched the attributes indexed by both novice and expert indexers (Jörgensen, Jaimes, Benitez, & Chang, 2001).

Burford, Briggs, & Eakins's image taxonomy attempted to map image description to existing database structures and "query expression by users" (2003, p. 123) in order to facilitate non-expert searching. They asserted that their work differed from previous studies in indexing insofar as it was user-centered rather than system-centered by enabling users to use natural language in their queries (2003). In order to facilitate this kind of browsing, the authors proposed a nine-level framework for describing images which included: perceptual primitives, geometric primitives, visual extension, semantic units, contextual abstraction, cultural abstraction, technical abstraction, emotional abstraction, and metadata (Burford, Briggs, & Eakins, 2003). Although they stated that their framework would allow for indexing to be done in a more user-centered manner, many of the attributes they identified have been well examined by other scholars such as Shatford Layne, Jörgensen, and Jaimes and Chang; among these are visual and linguistic distinctions, *Of* and *About* description, and the ability to describe and associate like images (Burford, Briggs, & Eakins, 2003).

Enser noted that one of the major challenges for image indexing is the lack of exchange between researchers in image retrieval and those that do professional work in image management, and that both groups "need a shared perception of the principles and practices that guide their respective

endeavors if both opportunity and challenges are to be addressed effectively” (2008a, p. 3). In the case of indexing, Enser explored former models for image description, and found the Jaimés and Chang’s pyramid blurred the line between generic and specific subject matter found in Shatford Layne’s model (2008a). This offers the practitioner a “generic-specific continuum” for identifying visual elements to index, as well as the ability to generate subject terms through controlled vocabularies and free text description (Enser, 2008a). Despite this, Enser noted the continued veracity of Shatford’s observation in 1986 that semantic image indexing was prone to inconsistency and the extent and depth to which it should exist for a single image was unclear (2008a). This emphasis on matching a user’s request to a string of words or indexed subject terms “ignores the fact that the information need is in the visual domain and translates the problem into a traditional text retrieval operation” (Enser, 2008a, p. 20).

The researcher of image description and retrieval, however, “is enabled to focus exclusively on the technical aspects of the retrieval paradigm” (Enser, 2008a, p. 22). For researchers, this is separated into the tiers of syntactical image processing, object/scene/activity identification, and the situation of those visual elements “within the user’s sociocognitive space” (Enser, 2008a, p. 23). For researchers, bridging the gap between syntax and a user’s semantically complex query is of the utmost importance, as is increased interest in image description ontologies, which Enser posited could help to unite the concerns of users, practitioners, and researchers by allowing for more sophisticated semantic relationships between image elements (2008a). Enser concluded that these traditional ways of considering indexing practices must accommodate new models of description, such as user-supplied indexing and folksonomic description, which is explored more in section 2.6.6 (2008a).

This distinction between the image description practitioner and researcher is reflected in the practical guidance offered in documents outlining image description best practices. Cognitive processes and

image syntax, while not wholly irrelevant to the practitioner, takes a secondary role to providing image subject access and using controlled vocabularies effectively, for example.

2.5 Best Practices and Standards: An Overview

2.5.1 Providing subject access.

The Getty's 2002 publication *Introduction to Art Image Access: Issues, Tools, Standards, Strategies* featured best practices and standards for subject access from Shatford Layne; much of the recommendations therein follow the indexing models described earlier. Shatford Layne recommends that indexers follow the *Of/About* model and the generic and specific subcategories; however, in this case, the author's description model is integrated with tools and vocabularies such as the VRA core metadata schema and the Getty's Categories for the Description of Works of Art schema (2002). For example, the "Description" subcategory of "Subject Matter" is analogous to the *Ofness* of the image (Shatford Layne, 2002). Additionally, Shatford Layne indicated to indexers that thinking about *Ofness* can allow them to identify various attributes of the image, such as people, objects, activities, places, and times (2002).

The Visual Resource's Association publication, *Cataloguing Cultural Objects* (CCO), also prescribed the use of Shatford's Panofskian model (Baca, Harpring, Lanzi, McRae, & Whiteside, 2006). In this approach, the CCO asserted that the collection, users, technical specifications, and budget should be analyzed to account for and balance specificity, exhaustivity, ambiguity and uncertainty, organization of data, and use of subject authorities (Baca, Harpring, Lanzi, McRae, & Whiteside, 2006).

Shatford Layne offered an interesting example in her recommendations for image indexing, which perhaps unintendedly offers insight into the way in which this model allows for indexer bias. One of the first images offered as an example for indexing is Edward Curtis's *The Eclipse Dance*, a

photograph commonly associated with his series *The North American Indian* (Wakeham, 2008). Shatford Layne (2002) suggested that this image is *Of* “ceremonial dance”, “Eclipse Dance”, “First Nations”, and “Kwakwiltl”—of course, these examples include both generic and specific *Of* terms—and that possible *About* terms might be “superstition” or “respect for nature” or “the human impulse to explain and control natural phenomena”.

These interpretations reflect Shatford Layne’s understanding of First Nations ceremonial and traditional knowledge, not to mention a lack of awareness of Curtis’s erasure of First Nations identity and reinforcement of the “noble savage” and “vanishing race” tropes in his *The North American Indian* series (Wakeham, 2008). Shatford Layne (2002), using those subject terms, would have reinforced these biases, forcing users to navigate, interact, and interpret this image according to those inaccurate and problematic subject access points; nevertheless, the author contended that any subject access, regardless of how subjective or inconsistent, is useful. The questions that this begs is, to whom is this useful? The answer, most likely, is that it is useful to those for whom this type of bias and interpretation reinforces existing misconceptions.

2.5.2 Controlled vocabularies.

Returning to best practices, the Getty recommended the use of the metadata schema CDWA, or Categories for the Description of Works of Art, which as of 2002 included three subcategories for subject matter: Subject Matter – Description, Subject Matter – Identification, and Subject Matter – Interpretation (Harpring, 2002). These three subcategories deliberately follow the Panofskian model for subject indexing, “but in a somewhat simplified and more practical application of the principles, one better suited to indexing subject matter for purposes of retrieval” (Harpring, 2002, n.p.). As of 2014, the CDWA guidelines included seven subfields for subject matter: subject display, general

subject terms, specific subject terms, outside iconography terms, subject interpretive history, remarks, and citations (Baca & Harpring, 2014, n. p.).

It is important to note that when describing images according to CDWA's guidelines, "indexing should be a conscious activity performed by knowledgeable catalogers who consider the retrieval implications of their indexing terms, and not by an automated method that simply parses every word in a text intended for display into indexes" (Baca & Harpring, 2014, n.p.). As of 2002, the Getty remarked that while data structures could permit the display of full-text descriptions to clarify ambiguous information about images, indexing for retrieval should always employ controlled vocabularies in order to ensure consistency; this distinction between free text for display and controlled vocabularies for indexing were echoed by the CCO (Harpring, 2002; Baca, Harpring, Lanzi, McRae, & Whiteside, 2006).

When indexing decorative arts or architecture, the Getty's guide also recommended that subject matter may not be immediately apparent or relevant, but "for the sake of consistency, however, and always keeping end-user retrieval in mind, it is useful to note subject matter for these types of objects as well" (Harpring, 2002, n.p.). The CCO recommended in the case of decorative arts, that the object's function be recorded as part of the subject matter (Baca, Harpring, Lanzi, McRae, & Whiteside, 2006). Additionally, the Getty and CCO specified that in cases where information about the image is ambiguous, or there is more than one interpretation of the work, the data structure should enable users to access the work with these differing interpretations (Harpring, 2002; Baca, Harpring, Lanzi, McRae, & Whiteside, 2006). Additionally, non-expert cataloguers should avoid detailed description unless they have the time and ability to conduct research on an image; according to the Getty, it is better to be broad and accurate than specific and inaccurate (Harpring, 2002).

When employing controlled vocabularies, the Getty noted that “no single authority can provide adequate subject access for most collections” (Harpring, 2002, n.p.); therefore, they recommended that institutions create authorities for local use that have been compiled from existing vocabularies such as the Art and Architecture Thesaurus (AAT), Thesaurus for Graphic Materials (TGM), and even the Library of Congress Subject Headings (LCSH). The CCO also recommended the inclusion of local terminology in addition to terms taken from several controlled vocabularies (Baca, Harpring, Lanzi, McRae, & Whiteside, 2006).

2.5.3 Cataloguing practices and techniques.

According to the Getty’s 2002 recommendations, the skill and expertise of the cataloguer is vital to connecting users to the resources they seek; as such, a cataloguer’s skill is demonstrated in their use of structure and methodology (Hourihane, 2002, n. p.). For image cataloguing, the cataloguer acts as a “‘professional’ viewer or analyst in which subject elements are abandoned and consistency in structure and approach predominates” (Hourihane, 2002, n.p.). According to Hourihane of the Getty, image cataloguers are professionals capable of suspending emotional response, intuition, and bias when perceiving an image; at the same time, they may also be capable of interpretation based on prior knowledge or expertise outside of cataloguing (2002).

The cataloguer’s structure, then, is also the structure that the cataloguer imposes on the subject matter, and therefore on the manner in which viewers interact with it (Hourihane, 2002). The Getty posited that the cataloguer is capable of “reading” an image systematically in order to identify the image’s main visual elements (Hourihane, 2002). As Enser (2008a) also found in their comparison of image description researchers and practitioners, for those engaged in describing and indexing subject matter, speed is an important factor for specificity and exhaustiveness of cataloguing (Hourihane, 2002). According to CCO, the cataloguer balances this by “promoting good access to the works and

images coupled with clear, accurate descriptions that users will understand” (Baca, Harpring, Lanzi, McRae, & Whiteside, 2006, p. 7). Additionally, CCO recommended that cataloguers take under consideration the following challenges when determining appropriate levels of specificity and exhaustivity: size of the collection, focus of the collection, availability of information to cataloguers, expertise of cataloguers and users, and the capabilities of data structures in place (Baca, Harpring, Lanzi, McRae, & Whiteside, 2006).

A cataloguer’s methodology, according to Hourihane (2002), is the way in which they use the tools and standards in order to transmit subject matter to the user. These tools include controlled vocabularies such as Iconclass or AAT, or possibly free text description, which adds to controlled vocabularies by allowing “the cataloguer to give an unrivaled mental image of the subject matter of each work of art and, in particular, to describe the relationship of elements to one another in the work” (Hourihane, 2002, n.p.). Regardless, the Getty suggested that the skilled cataloguer use syndetically structured authorities to provide more context for the terms being indexed (Hourihane, 2002). The CCO added to these recommendations that, at a minimum, cataloguers should describe images using the VRA Core Categories or the CDWA core elements; in the case of CDWA, this does include the “Subject” field (Baca, Harpring, Lanzi, McRae, & Whiteside, 2006).

Given that cataloguers must rely on controlled vocabularies and free text description to enable image retrieval, an investigation of these tools may provide additional insight into the nature of image subject access. Other types of tools, such as folksonomic description, are also considered as a means of providing subject access.

2.6 Controlled Vocabularies, Free Text, and Folksonomic Description

2.6.1 AAT (Art and Architecture Thesaurus).

The 1994 *Guide to Indexing and Cataloguing with the Art & Architecture Thesaurus* described indexing as “the procedures for examining items, determining their physical and visual contents, and selecting appropriate indexing terms to be used as access points to the catalogue record” (Petersen & Barnett, 1994, p. xv); indexing, according to this guide, is successful when it mirrors a user’s search. Rather than employing the *Of/About* model, the guide describes the indexing process as the description of what the image *is* or *is about* (which is effectively the same ideas using different language) and includes topical concepts in the image, identification of visual elements, and interpretation of thematic or iconographical elements (Barnett, 1994). When using AAT to catalogue objects, the guide encouraged cataloguers to understand the purpose of collections of objects and to understand that “the ability of museums is not only to research, to interpret, and to exhibit their collections, but also to exchange that information electronically, is directly related to the quality and the kind of object documentation in place” (McFadden & Tschann, 1994, p. 126).

In the guide for the AAT, the perspective of the cataloguer or the institution is acknowledged, as it determines the terminology used (McFadden & Tschann, 1994). This point of view, the authors asserted, would be especially true in the case of museums with different focuses; clearly, the reason that an object was acquired by a museum would have a relationship to its mission or collection content, and this would have a bearing on the type of access that can and should be offered to users (McFadden & Tschann, 1994).

In an updated description of the thesaurus from 2010, AAT is “a structured vocabulary containing, as of this writing, approximately 131,000 terms and other information relating to objects, materials, techniques, activities, and other concepts” (Harpring, 2010). Each record is structured around a

concept, of which there are 34,000; concepts have authority records which include preferred terms and terms in other languages (Harpring, 2010). Additionally, the AAT is polyhierarchical and includes equivalence and associative relationships (Harpring, 2010). The purpose of the AAT is to provide generic terms rather than specific proper nouns or unique entities, and is for use in attributes of images other than subject matter, such as types, materials, activities involved in creating the work, style, role of the creator, and other abstract concepts (Harpring, 2010). More abstract concepts proceed hierarchically towards more concrete attributes, and the entire vocabulary is structured around the following facets: associated concepts, physical attributes, styles and periods, agents, activities, materials, and objects (Harpring, 2010). While the AAT is not intended to be subject-specific, its scope is both international and multicultural (Harpring, 2010). AAT was made available as linked open data in 2014, along with the other Getty vocabularies in order to enable semantic queries and additional connectedness between resources (Cobb, 2015).

2.6.2 TGM (Thesaurus of Graphic Materials).

Alexander and Meehleib, co-editors of the Thesaurus for Graphic Materials, examined the use of TGM in the Library of Congress Print and Photograph Division, where the thesaurus was developed (2001). According to the authors, the LC applies TGM to collections using a blended method, wherein item-, group-, and collection-level cataloguing is used depending on the nature of the collection; high use or valuable images merit item-level cataloguing (Alexander & Meehleib, 2001). The cataloguing method incorporates terms from both TGM vocabularies: TGM 1, which includes subject terms and TGM 2, which includes physical and formal terms; additionally, the authors remarked that collection- or group-level description calls for broader terminology to be used while indexing a single image produces more specific subject access points (Alexander & Meehleib, 2001).

The LC Print and Photograph Division first considered AAT and LCSH for indexing purposes, but found that both were inappropriate for the types of materials being described; the LCSH not being specific enough, and the AAT lacking terms for abstract concepts such as allegories (Alexander & Meehleib, 2001). The subject terms covered by TGM include activities, objects, occupations, events, concepts, and structures (Alexander & Meehleib, 2001). According to Harpring of the Getty, TGM does indeed aim for broader use than AAT including political and social terminology, and employs a hierarchical structure unlike LCSH, including equivalence and associative relationships (2010). Generally speaking, this makes AAT more precise than TGM, and similar to LCSH insofar as it encourages users “to add nationality, geographic, chronological, and topical facet indicators when creating indexing entries” (Harpring, 2010).

The authors described subject analysis as the process through which cataloguers determine which visual elements that are most important for enabling access; according to Alexander and Meehleib, this may not be just the most visually apparent forms, but could include subjects found in the image that are rare or otherwise notable for users (2001). Determining what these rare and interesting attributes are, or otherwise indexing images with little contextual information, requires cataloguers to conduct research unless they possess a considerable amount of expertise (Alexander & Meehleib, 2001). Aside from this highly specific indexing, Alexander and Meehleib suggested that users of TGM follow Panofskian methods for description by encouraging them to think of images in terms of *Of* and *About* (2001).

2.6.3 Nomenclature for Museum Cataloguing

Originally developed as a classification system for historical museums and organizations, Nomenclature was created by museum professionals specifically for museums (Harpring, 2010). Published by the American Association of State and Local History, over time Nomenclature has been

revised by committees of experts and museum professionals, and is based on taxonomies used by scientists; terms are organized into hierarchies based on types of artifacts (Harpring, 2010). The revised list includes ten categories for artifacts with six levels of hierarchy: structures, furnishings, personal artifacts, tools and equipment for materials, tools and equipment for science and technology, tools and equipment for communication, distribution and transportation artifacts, communication artifacts, recreational artifacts, and unclassifiable artifacts (Harpring, 2010). The six levels of hierarchy include: category, class, sub-class, primary object term, secondary object term, and tertiary object term (Dunn, 2015).

Nomenclature includes preferred names for artifacts in addition to commonly used terms; these are referred to as object terms and object names, respectively (Harpring, 2010). Although a fourth revision of Nomenclature has been released, most museums in Canada still use the third version (Dunn, 2015). As of 2015, Nomenclature included 16,905 terms in total with 14,624 object terms and 2,281 object names (Dunn). Harpring posited that although there is some overlap between AAT and Nomenclature, there are some differences which necessitate the need to use both when indexing images (2010). Nomenclature offers “shallow coverage of more disparate types of cultural artifacts, and it has headings in addition to terms” (Harpring; 2010, n.p.), while AAT, with its narrower scope, offers terms that are more specific and cover artistic and architectural materials more broadly. AAT has also incorporated those parts of Nomenclature that fall under its purview; this is mostly within the Objects facet of AAT (Harpring, 2010).

2.6.5 FNHL (First Nations House of Learning) subject headings.

The First Nations House of Learning subject headings were developed at Xwi7x̱wa Library at the University of British Columbia, which contains approximately 15,000 items comprised of “monographs, media, grey literature, serials, dissertations, maps, posters, realia, special collections,

and archival materials” (Doyle, Lawson, & Dupont, 2015, p. 109). Xwi7xwa works to not only furnish the University with materials concerning Indigenous experiences and knowledge, but to create tools and models which “Indigenize the discipline of library and information studies” (Doyle, Lawson, & Dupont, 2015, p. 110). Central to this mission is the protection of Indigenous autonomy within the University library system, which includes the local metadata and classification systems that they have developed in direct response to the recolonization of Indigenous cultural materials as a result of Western knowledge organization (Doyle, Lawson, & Dupont, 2015). The resulting system of classification, which was developed with the input of First Nations scholars and students, eventually became the FNHL subject headings; it was created to reflect Indigenous epistemologies and values, and as such, is not discipline-based like the AAT or TGM but focused on the interconnectedness of information (Doyle, Lawson, & Dupont, 2015). After applying to the LC MARC Standards Office and revising naming conventions and other syntax specifications, the thesaurus became fully indexable in MARC records (Doyle, Lawson, & Dupont, 2015).

Knowledge organization, the authors asserted, is not an:

isolated endeavor that takes place in the back rooms of a technical services area or as decontextualized theoretical research. Rather, we argue that knowledge organization is fundamental to the Xwi7xwa Library’s key services and programming, and is deeply embedded in organizational, political, and social contexts of a particular time and place, and within the global relations of those dimensions; its possibilities enabled or constrained within those contexts. (Doyle, Lawson, & Dupont, 2015, p. 108)

By acknowledging that knowledge organization systems are socially constructed and reinforce and transmit cultural knowledge, FNHL subject headings allow users of the UBC Library catalogue to retrieve Indigenous materials alongside settler colonialist narratives, which then allows users to effectively contextualize the information that they retrieve and work against the ways that traditional LIS knowledge organization positions “Indigenous knowledge as inferior knowledge” (Doyle,

Lawson, & Dupont, 2015, p. 115). At Xwi7xwa Library, this is used to demonstrate to users the unique type of information literacy that is necessary for finding Indigenous materials; in a catalogue which still prioritizes and uses LC subject headings with inaccurate and offensive terminology, more respectful search terms may not enable effective retrieval, which can help normalize inaccurate or even harmful information and perpetuate misconceptions among non-Indigenous users (Doyle, Lawson, & Dupont, 2015).

The subject headings list contained 11,000 terms as of 2015, and the main subdivision of the list is the authority for names of First Nations tribes, including the terminology issues, alternate spellings, and non-preferred terms (Doyle, Lawson, & Dupont, 2015). Additional subdivisions include topic; geography (such as the names of reserves or Indigenous names for specific places); and chronology, which is waiting for additional development pending research and consultation (Doyle, Lawson, & Dupont, 2015). Subject headings are applied to library materials by staff at Xwi7xwa Library after standard cataloguing has been completed by the UBC Library's Central Technical Services staff, and this also includes dialect and First Nations language information (Doyle, Lawson, Dupont, 2015). According to the authors, the development of the subject headings is an evolution based on discourses on the topic, the collection of Xwi7xwa, but also on the resources that librarians have available (Doyle, Lawson, & Dupont, 2015).

A similar project described by Littletree and Metoyer (2015) acknowledged the importance of a community's power to name in the storage and transmission of knowledge. Metoyer developed the Mashantucket Pequot Thesaurus of American Indian Terminology, which "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 (LCSH)" (Littletree & Metoyer, 2015, p. 641). It was developed for the collection at the Mashantucket Pequot Museum and aims to

reflect Indigenous epistemologies, which are interconnected and dynamic; therefore, it is premised on four relational domains: mental, spiritual, physical, and social (Littletree & Metoyer, 2015). Although the thesaurus was still under development as of 2015, the authors emphasized the importance of Indigenous scholars in leading and contributing to its construction (Littletree & Metoyer, 2015).

In order to consider other ways that communities of users can participate in and contribute to knowledge organization, folksonomic description has been investigated as a possible tool for image retrieval.

2.6.6 Folksonomic description.

In 2006, Matusiak posited that user-generated metadata could improve and enhance description of digital image collections, which the author argued is a challenge given the outpacing of retrieval technology compared to the volume of digital images and collections being generated in digitization projects. Websites like Flickr and an increasingly interactive online environment offered, to Matusiak, new opportunities for image description and indexing (2006). Yoon concluded that integrating and analyzing user-generated tags for image thesaurus construction had the possibility to provide seamless retrieval from user query to indexing terminology (2009). Much like Jørgensen's (1998) task-based exercise to parse user's natural language choices for determining appropriate depth of concept-based indexing, Matusiak (2006) and Yoon (2009) examined the language of users for a bottom-up approach to thesaurus development, which is contrasted with AAT and TGM's overly specialized and professional terminology.

Yoon (2009), premising their findings on Shatford Layne's (1994) *Of/About* and generic/specific model, found that on Flickr, specific tags—or tags that identified persons, objects, locations, events, or chronology—accounted for 29% of all tags, while generic terms came to 52% of social tags.

However, Yoon asserted that a more highly structured hierarchical format of thesauri such as TGM or AAT would be more useful for users to revise queries and to browse effectively (2009). Similarly, Ménard (2012) declared user participation as crucial to the development of a taxonomy, but highlighted the downsides to uncontrolled user indexing, which are primarily the contextual ambiguity for many keywords and the “lack of synonymic control involves the use of many different keywords to describe the same concept” (p. 42). Matusiak (2006) suggested that social tagging did not have to exist in the stead of traditional indexing, but as an “enhancement” (p. 295) to the perks of interoperability and consistency of controlled vocabularies.

A 2012 study by Stvilia, Jörgensen, and Wu investigated the extent to which socially-created metadata added to user discovery and access of images compared to traditional thesauri such as AAT, TGM, or LCSH alone. The authors used images taken from the Library of Congress’s photostream on Flickr in order to gather both the indexed terms and to extract the tags already created, in addition to more general information from English Wikipedia, which were then used in three experiments focused on description, searching, and developing queries (Stvilia, Jörgensen, & Wu, 2012). They found that “participants perceived the social terms as generally useful” (Stvilia, Jörgensen, & Wu, 2012, p. 105), and that using social tags doubled the amount of terms indexed overall compared to the amount of terms indexed using controlled vocabularies alone. Overall, the study confirmed Matusiak (2006) and Yoon’s (2009) assertion that social tagging should not replace controlled vocabularies but should be used as an extension for providing additional access points (Stvilia, Jörgensen, & Wu, 2012).

Oomen and Arroyo (2011) explored crowdsourced activities in museums such as correction and transcription, contextualization, complementing the collection, classification, co-curation, and crowdfunding. Social tagging was associated with crowdsourced classification, and the authors highlighted the *steve.museum* initiative and the Library of Congress’s Flickr photostream as

exemplars of this type of cultural institution-led crowdsourcing (Oomen & Arroyo, 2011). Ridge (2013) expanded this explanation to identify specific types of user tags: subjective tags, personal tags, factual tags, rankings, geospatial coordinates, and others. Oomen and Arroyo did, however, identify several challenges associated with social tagging in cultural heritage institutions, such as “stimulating users to contribute specific types of knowledge through engaging them via semantic-based tags and suggestions” (2011, p. 146), resolving ambiguity in data gathered, determining the completeness of user annotation, motivating users to consistently contribute, and triangulating the data given in order to ensure quality and accuracy.

Other studies of crowdsourcing, particularly in museums, highlight the ways in which crowdsourcing activities deepen community engagement with museum holdings. Kalfatovic, Kapsalis, Spiess, Van Camp, and Edson (2008) describing the Smithsonian’s entry into the Flickr Commons, an online space on Flickr for institutions to share images, found that participation in the Commons did not substantially increase traffic on their own website, though it did increase individual image views significantly, and social tagging and comment sections improved the institution’s outreach efforts. Trant with the participants of the *steve.museum* project (2006), explored how social tagging allows users to think of subject matter or meaning in more personal terms, thereby increasing and deepening community engagement and opening up the museum’s holdings to natural language as employed by museum visitors rather than the professional language of museum documentation. Ridge (2013) echoed this sentiment that truly crowdsourced projects, which “offer tasks that will contribute to the specific, shared, and substantial goals of the project” (p. 436), allow participants to engage deeply with a discipline while helping institutions complete important tasks. Indeed, Trant’s study with the participants of the *steve.museum* project echoed the findings of Stvilia, Jørgensen, and Wu (2012), stating that user-created metadata creates additional access points and that even untrained cataloguers contribute useful terms with consistency.

Although the literature represents crowdsourced description projects from libraries and museums, studies focused on library holdings (Stvilia, Jörgensen, & Wu, 2012; Yoon, 2009; Matusiak, 2006) investigated how social tagging can be compared to controlled vocabulary usage, while studies based on museum (Trant, 2006; Oomen & Arroyo, 2011) discussed how this can have an effect on user and community engagement. Other differences between libraries and museums may help to demonstrate how subject access to images is dependent on the type of institutions from which metadata originates.

2.7 Libraries and Museums

2.7.1 Cataloguing practices.

Libraries and museums share many activities, such as acquisition, arrangement, providing access, and preservation, but the methods employed during these activities differ greatly (Timms, 2009; Duff, Carter, Cherry, MacNeil, & Howarth, 2013). In a 2011 analysis of metadata records from sixteen cultural heritage institutions in New Zealand, Lim and Liew found a great deal of inconsistency in metadata from libraries, archives, galleries, and museums due to differing emphases placed on specific fields and the desire to balance local needs with standards and best practices (Lim & Liew, 2011).

Libraries engage in description through bibliographic records and subject analysis, both of which facilitate intellectual access to the library's holdings, and can be shared or created in tandem with other institutions with similar materials; in contrast, museums describe their holdings in order to support administrative functions, and cannot be shared among institutions because their holdings tend to be unique (Timms, 2009; Allen & Bishoff, 2002). According to Trant (2006), subject access is not a minimum requirement for a museum's administrative and business functions, therefore many museum documentation guidelines do not require it. Allen and Bishoff asserted that museums are less likely to offer a great deal of online access to their collections because of their close ties to the

tourism sector, as this may hurt visitor counts (2002). According to White (2002), libraries were more likely than museums to provide subject access to their holdings, and to do so using controlled vocabularies. Museums, on the hand, were more likely to create local vocabularies and indexes, though White (2002) pointed out what a time-consuming and arduous process this can be.

Additionally, the range of content found in museums, from art objects to botanical specimens to historical artifacts, means that even among museums there is a need to employ subject-specific lists from their respective field (Allen & Bishoff, 2002). Lim and Liew also remarked that museum metadata schema include fields such as exhibition history or provenance, materials, and techniques, which are not commonly found in library bibliographic description; additionally, lack of funding and staff expertise contributed to incomplete or inconsistent metadata creation in museums (2011).

2.7.2 Digital collections and reconvergence.

Allen and Bishoff posited that digitization efforts, however, are fertile ground for collaboration between libraries and museums, though differing metadata standards and interoperability are a significant challenge (2002). Additionally, integrating access between differing data content, structure, and value standards can be an issue for “hybrid” institutions which house more than one type of cultural heritage institution (Timms, 2009; Duff, Carter, Cherry, MacNeil, & Howarth, 2013). The rise of flexible schemas such as Dublin Core have done much to improve interoperability, as have systems which support crosswalks, metadata aggregation, and federated searching (Timms, 2009). Duff, Carter, Cherry, MacNeil, and Howarth (2013) contended that the merging of cataloguing and reference services has more than administrative implications, including shifts in professional identity and institutional culture. This also complicates the cataloguing process as cataloguers with expertise in a given subject area must operate across several other collections and types of materials (Duff, Carter, Chery, MacNeil, & Howarth, 2013).

Convergence and collaboration between museums and libraries, however, can promote institutional efficiency once these obstacles have been resolved (Askin, 2015). Indeed, Given and McTavish (2010) suggested that the reconvergence of libraries and museums in the digital realm reflects the shared roots of these organizations in the “cabinet of curiosities” (p. 10) collections of the early modern period. They also remarked that museum and information professionals “must work together toward a common curriculum and common baseline of expert knowledge to gather, manage, and make accessible the vast array of materials in the coming century” (Given & McTavish, 2010, p. 28).

In their discussion of the Indigenization of knowledge organization, Doyle, Lawson, and Dupont suggested that the integration of Indigenous epistemologies, which treat information as interconnected rather than separated into silos of disciplines, support institution and collection convergence (2015). This also promotes the efficient use of resources among cultural heritage institutions and the capability of many types of materials to contain knowledge, and many types of actors to produce it (Doyle, Lawson, & Dupont, 2015).

2.8 Conclusion

In comparing the body of literature that discusses image description with the writings on Indigenous knowledge and its relationship to cultural heritage institutions, a tension around the nature of expertise continually surfaces. This is present even within the relationship between image description researchers and practitioners, where the classic strain between theory and praxis begs the questions, who knows best (Enser, 2008a)? This is further complicated by the ways in which description models and best practices documents construct the expertise of the cataloguer by touting their ability to suspend bias and separate the interpretive process that occurs between perceiving forms with the eye and conceiving ideas in the mind (Hourihane, 2002; Jaimes & Chang, 2000). Additionally, the

Aboutness of an image requires cataloguers to possess additional subject expertise or secondary research in order to fully and accurately describe complex images (Alexander & Meehleib, 2001).

All of these types of expertise draw on institutionalized knowledge that is passed within the confines of cultural heritage institutions. How, then, can collaborative, community-based, embodied, and ceremonial knowledge interact with “expertise” in this sense? In the past, Indigenous epistemologies have been treated as a subject of study rather than a viable contribution to understanding Indigenous visual culture and ways of knowing (Turner, 2015). For Duarte and Belarde-Lewis, the answer, then, is to allow Indigenous partners to lead collaborative efforts and initiatives to develop alternative knowledge organization systems, while cultural heritage institutions follow (2015). In this sense, the expertise of Indigenous communities is held in an equal, if not higher, place than Western institutionalized thinking about knowledge organization. Although they are not identical, the interactive and dynamic nature of Indigenous knowledge is more similar to folksonomic description, which favors the dispersal of knowledge and natural language of users, thereby complicating this institutionalized conception of “expertise” further.

In all of these cases, expertise is constructed and transmitted in a multitude of ways. What remains to be seen, however, is whether this knowledge can be conveyed in image description and whether institutions can bring together these types of expertise in a meaningful way.

3. Methodology

Given the findings of the literature review regarding Indigenous epistemologies, description of Indigenous visual culture in cultural heritage institutions, image description models, tools for providing image subject access, and differences between museum and library professional practice, the author returned to the research question in order to understand how these various topics intersect and how they can be further investigated.

3.1 Research Question (Revised)

Main Question:

How do institutions describe and index images of Indigenous visual culture in their digital collections?

Additional Questions:

1. How does institution type, engagement with Indigenous communities or participation in repatriation initiatives, and/or size of a collection influence indexing practices?
2. How is the cataloguer's expertise supported (i.e., guides, handbooks, etc.)? How is the user's expertise treated (i.e., folksonomic tagging, free text description, etc.)? How is the originating community's expertise considered (i.e., collaborative, institutional activities, etc.)?
3. Do indexing models effectively bridge the semantic gap and reflect Indigenous epistemologies? Are these issues capable of being resolved in a single model?

3.2 Research Design, Charted

The development of the research methodology was therefore extrapolated from these questions and mapped to various stages of the research, which will be discussed in more detail below. Variables outlined and research instruments can be found in the appendices.

Table 3.1. Research design, charted

Research Question	Hypothesis	Data Required	Variables	Instruments/ Methods
MQ	Overall, cataloguers of images of Indigenous visual culture follow the Panofskian <i>Of/About</i> model.	<ul style="list-style-type: none"> • Image subject terms and description 	<ul style="list-style-type: none"> • OfGeneric • OfSpecific • AboutGeneric • AboutSpecific 	<ul style="list-style-type: none"> • Step one (metadata content analysis)
MQ	Image collections of Indigenous visual culture are more likely to employ generic and content-based subject terms for indexing.	<ul style="list-style-type: none"> • Image subject terms and description 	<ul style="list-style-type: none"> • OfGeneric • AboutGeneric • SubjectFrequent 	<ul style="list-style-type: none"> • Step one (metadata content analysis)
MQ, 2	Image collections of Indigenous visual culture are likely to use free text description instead of subject term indexing.	<ul style="list-style-type: none"> • Image subject terms and description • Cataloguer response re: controlled vocabularies 	<ul style="list-style-type: none"> • ControlledFreeText • TFControlledVocab • ControlledFreeText • ControlledVocabNA • ControlledVocabLCSH • ControlledVocabTGM • ControlledVocabAAT • ControlledVocabNomen • ControlledVocabOther • TFLocalVocab 	<ul style="list-style-type: none"> • Step one (metadata content analysis) • Step three (questionnaires)
1	Small collections and institutions with limited cataloguing staff are likely to have minimal indexing.	<ul style="list-style-type: none"> • Size of collection • Amount of cataloguers • Image subject terms and description 	<ul style="list-style-type: none"> • CollectionSize • OtherCataloguers • ImageSubject 	<ul style="list-style-type: none"> • Step one (metadata content analysis) • Step two (institutional case) • Step three (questionnaires)
1	Large collections are more likely to use controlled vocabularies.	<ul style="list-style-type: none"> • Size of collection • Image subject terms and description 	<ul style="list-style-type: none"> • CollectionSize • ControlledFreeText • TFControlledVocab • ControlledFreeText • ControlledVocabNA 	<ul style="list-style-type: none"> • Step one (metadata content analysis) • Step two

Research Question	Hypothesis	Data Required	Variables	Instruments/ Methods
		<ul style="list-style-type: none"> • Cataloguer response re: controlled vocabularies 	<ul style="list-style-type: none"> • ControlledVocabLCSH • ControlledVocabTGM • ControlledVocabAAT • ControlledVocabNomen • ControlledVocabOther • TFLocalVocab 	<p>(institutional case)</p> <ul style="list-style-type: none"> • Step three (questionnaires)
1	Libraries are more likely to use controlled vocabularies and traditional subject heading systems.	<ul style="list-style-type: none"> • Type of institution • Image subject terms and description • Cataloguer response re: controlled vocabularies 	<ul style="list-style-type: none"> • InstitutionType • ControlledFreeText • TFControlledVocab • ControlledFreeText • ControlledVocabNA • ControlledVocabLCSH • ControlledVocabTGM • ControlledVocabAAT • ControlledVocabNomen • ControlledVocabOther • TFLocalVocab 	<ul style="list-style-type: none"> • Step one (metadata content analysis) • Step two (institutional case) • Step three (questionnaires)
1	Museums are less likely to use controlled vocabularies overall, but are likely to use vocabularies such as AAT or Nomenclature which focus on physical attributes of objects.	<ul style="list-style-type: none"> • Type of institution • Image subject terms and description • Cataloguer response re: controlled vocabularies 	<ul style="list-style-type: none"> • InstitutionType • ControlledFreeText • TFControlledVocab • ControlledFreeText • ControlledVocabNA • ControlledVocabLCSH • ControlledVocabTGM • ControlledVocabAAT • ControlledVocabNomen • ControlledVocabOther • TFLocalVocab 	<ul style="list-style-type: none"> • Step one (metadata content analysis) • Step two (institutional case) • Step three (questionnaires)
1	Institutions that work with Indigenous communities are likely to incorporate accurate, more respectful subject headings such as FNHL or local vocabularies.	<ul style="list-style-type: none"> • Institutional participation in outreach initiatives • Image subject terms and description • Cataloguer response re: controlled vocabularies 	<ul style="list-style-type: none"> • CollabDecolonization • AppropriateLanguage • ControlledVocabOther • TFLocalVocab • InstitutionDecolonization • InstitutionIndigTerm 	<ul style="list-style-type: none"> • Step one (metadata content analysis) • Step two (institutional case) • Step three (questionnaires)
1, 2	Cataloguers at institutions which	<ul style="list-style-type: none"> • Institutional participation 	<ul style="list-style-type: none"> • CollabDecolonization • AppropriateLanguage 	<ul style="list-style-type: none"> • Step one (metadata

Research Question	Hypothesis	Data Required	Variables	Instruments/ Methods
	have strong relationships with local Indigenous communities are more likely to be trained on and aware of Western bias in description and to employ systems like FNHL or local vocabularies.	<ul style="list-style-type: none"> in Indigenous outreach and engagement Image subject terms and description Cataloguer response re: training Cataloguer response re: controlled vocabularies 	<ul style="list-style-type: none"> ControlledVocabOther TFLocalVocab InstitutionDecolonization InstitutionIndigTerm InstitutionTraining HandbookLanguage HandbookNonWestern 	<ul style="list-style-type: none"> content analysis) Step two (institutional case) Step three (questionnaires)
2	Libraries are more likely than museums to train cataloguing staff on indexing models and approaches, and to have uniform guides and handbooks for staff to consult.	<ul style="list-style-type: none"> Type of institution Cataloguer response re: training 	<ul style="list-style-type: none"> InstitutionType InstitutionTraining TFSubjectAccess TFHandbook HandbookClear HandbookImageType HandbookSensitiveImages HandbookLanguage HandbookNonWestern 	<ul style="list-style-type: none"> Step two (institutional case) Step three (questionnaires)
1, 2	Institutions with small collections are likely to employ novice cataloguers and offer little training.	<ul style="list-style-type: none"> Size of collection Cataloguer response re: training Cataloguer response re: experience 	<ul style="list-style-type: none"> CollectionSize EmplStatus YrsExperience InstitutionTraining TFHandbook HandbookClear HandbookImageType HandbookSensitiveImages HandbookLanguage HandbookNonWestern 	<ul style="list-style-type: none"> Step two (institutional case) Step three (questionnaires)
2	Museums are more likely to enable social tagging in image collections.	<ul style="list-style-type: none"> Type of institution Social tagging functionality 	<ul style="list-style-type: none"> InstitutionType SocialTagging 	<ul style="list-style-type: none"> Step two (institutional case) Step three (questionnaires)
2	Image collections which crowdsource	<ul style="list-style-type: none"> Social tagging functionality 	<ul style="list-style-type: none"> SocialTagging CollabDecolonization 	<ul style="list-style-type: none"> Step two (institutional case)

Research Question	Hypothesis	Data Required	Variables	Instruments/ Methods
	description from Indigenous communities are more likely to use subject headings which are culturally sensitive and accurate.	<ul style="list-style-type: none"> • Institutional outreach and engagement with Indigenous creators and communities • Image subject terms and description 	<ul style="list-style-type: none"> • AppropriateLanguage • InstitutionIndigTerm 	<ul style="list-style-type: none"> • Step three (questionnaires)

Although there has been much written on indexing models and the semantic gap as well as the incorporation of Indigenous epistemologies in knowledge organization systems, as of this writing, there is no precedent of examining these concepts alongside each other. Therefore, there is not enough evidence to make informed hypotheses for question three. The author does intend, however, that this study opens the door for this conversation in the future.

3.3 Research Design

A cross-sectional design was employed in order to collect quantitative data and observe any patterns which emerged. The design of this research included content analysis and observation in addition to self-reporting questionnaires, in three stages: image metadata analysis derived from Artstor and Digital Public Library of America (DPLA) metadata and taken from case study collections, additional analysis of the institutions those case study collections are housed in, and self-reporting questionnaires to ask clarifying questions of cataloguers at those institutions. The first two steps included the observation of various institutions' subject metadata, with a focus on several variables derived from the research questions. In order to triangulate this information, the questionnaire gathered data from surveys that could not be derived from content analysis alone, such as cataloguer workflows and awareness of and sensitivity to Indigenous epistemologies and cultural heritage

institutions. Additionally, observation of image metadata or institutional documentation did not include cataloguing guidelines or handbooks, therefore necessitating consultation with cataloguers.

In order to reduce bias in the first two steps, content analysis was used to determine categories for analyzing metadata consistently; this ensures that the data gathered was unobtrusive, with no “reactive effect” (Bryman, 2008, p. 289), or interaction between the researcher and the subjects under observation, in this case the individuals who prepared image metadata. Additionally, this method was utilized not only in the examination of existing metadata, but also covered the cases in which image description is omitted, which is also of interest for this study. A self-completion questionnaire was a feasible method for framing this analysis of metadata with data gathered from cataloguers, as it was cheaper and faster to administer than interviewing, therefore making it more convenient for the researcher and the subjects (Bryman, 2008).

Each stage of the research design addressed different aspects of the research questions; therefore, the cases studied and variables measured also differed in order to provide a more holistic understanding of image subject application and usage.

3.3.1 Artstor and DPLA content analysis.

A significant challenge to this study was knowing the extent and number of institutions which have holdings of Indigenous cultural material which also have produced image and image metadata for those objects. In this case, it was most effective to use an image repository like Artstor or DPLA to conduct convenience sampling of image metadata based on a quota sample of collections from institutions that demonstrate relevant variables. Artstor and DPLA metadata was used in two ways: first, to get an approximate sense of the institutional population and to select case study collections accordingly, and secondly, for image metadata analysis.

The variables that can be best measured by this stage are as follows:

1. Presence of subject/descriptive metadata
 - If none exists, take note and skip variables two and three
2. Types of subject metadata represented
 - *Of* specific
 - *About* specific
 - *Of* generic
 - *About* generic
 - Controlled vocabulary
 - Free text description
 - Combination of free text and controlled vocabularies
3. Appropriateness of terminology
 - All appropriate
 - All neutral
 - All inappropriate
 - Some neutral, some appropriate
 - Some neutral, some inappropriate
 - Some appropriate, some inappropriate

For variable two, Shatford's (1986) four-part model was used to qualify the types of description used. This is partially because of the model's staying power over time for image description, and because it was simple enough to identify terms based on this four-part model.

3.3.2 Institutional content analysis.

Once case study collections were selected and image metadata was analyzed, the home institutions for these collections were observed. For these cases, institution and collection websites were examined for information regarding collaborative partnerships or relationships with Indigenous groups, as well as the overall size of the collections which feature Indigenous visual culture. Additional tools for description such as commenting or tagging systems were also observed. Also important to annotate was the institution type (ie, library, museum), and other relationships which may exist with other institutions, such as archives or universities. As will be discussed in more detail in section 3.5, the names of institutions were not reported in the research findings, only the relevant characteristics listed below.

The variables that can be best measured by this stage are as follows:

1. Type of institution
 - Museum, library
2. Relationships with other institutions
 - If none exists, take note and skip variable three
3. Type of partner or affiliated institutions
 - University, archives, tribal council, etc.
4. Size of collection (i.e., number of images of Indigenous visual culture and classification as large or small in comparison to the average collection size of the population)
5. Whether the institution participates in collaborative partnerships with local aboriginal communities or engages with Indigenous perspectives within the institutional context
 - If none exists, take note and skip variable six
6. Types of collaborative partnerships or initiatives

- Repatriation programs, collaborative collections, social tagging and commenting systems for generating descriptions, grant funding, etc.

3.3.3 Self-reporting questionnaire.

Additional information which may be too sensitive or informal to be located on institutional websites was gathered through self-completion questionnaires. All institutions selected as cases were contacted to find interested cataloguers, with the expectation that receiving responses from all of the case study institutions may not be likely. Indeed, the responses received were more numerous than the author had initially expected. This step was especially important for establishing the effectiveness of image description models, collaborative efforts with Indigenous communities, and the ways in which the expertise of the cataloguer is developed through internal documentation such as handbooks or metadata guidelines. Respondents were not asked whether they identify as Indigenous or not; although this may have had an effect on analysis, ultimately the author determined that this fell outside the scope of the research question and had the potential to make respondents more identifiable.

The variables measured by this stage are as follows:

1. Presence of guidelines/handbooks
 - If none exists, take note and skip variable two
2. Content and effectiveness of guidelines/handbooks
 - Use of controlled vocabularies
 - Use of local vocabularies
 - Use of appropriate and culturally sensitive terminology
 - If applicable, institutional use of social tags
3. Cataloguer expertise and experience in image description

4. Cataloguer affect and awareness of Indigenous knowledge organization and cataloguing bias
 - Personal affect towards or consciousness of colonization of Indigenous knowledge
 - Awareness of bias in LCSH and other knowledge organization tools
 - Institutional training engaging with these topics

3.4 Sampling

The sampling method used was similar to that of Lim and Liew (2011), which involved quota sampling as well as additional information solicited from cataloguers; while they used interviews to glean this information, the current study employed a questionnaire. The quota sample was utilized to gather data from an appropriate range of institutions; this ensured that variables such as institution type and collection size were accurately represented in the sample.

Twenty cases were selected according to following criteria:

- Has a collection of Indigenous visual culture of Canada and United States
- Metadata and images are available on Artstor or DPLA
- Equal representation of libraries and museums (ten of each)
- Equal representation of large and small collections (ten of each)

Metadata was gathered using the repositories Artstor and DPLA. This gave as much of a sense of the population as possible, and helped with determining how the size of one collection compares to another in order to derive an appropriate range of collection sizes. For example, determining whether a collection is large, small, or average is dependent on the rest of the population.

Most museum subject metadata was gathered from Artstor's API and fell under the following parameters:

- Keywords: “First Nations” OR “Native American” OR Indigenous
- Time period:
 - 1900 and earlier
- Geography:
 - Canada
 - North America
- Classification (classes selected most accurately reflect the notion of visual culture):
 - Decorative Arts, Utilitarian Objects and Interior Design
 - Sculpture and Installations
 - Photography

Artstor was used as a method for locating collections, and eventually was incorporated as a step during data gathering in order to reduce bias from the selection of case studies. Utilizing Artstor has benefits and limitations as a convenience sampling. The sample was limited firstly by the institutions which choose to participate and make images and metadata available to Artstor and secondly by those images and materials which institutions then choose to make available via Artstor. Therefore, the generalizability of the sample was greatly reduced (Bryman, 2012). Once these limitations were accepted, however, it also was clear that determining the exact population to draw the sample from— i.e., museums which house collections of Indigenous materials and which make images and metadata for those collections available online— was difficult to determine with any accuracy; probability sampling, therefore, was a feat that was insurmountable given the short amount of time for this research project.

DPLA’s API was also used to gather images and metadata that fell under the following parameters:

- Keywords: “First Nations” OR “Native American” OR Indigenous

- Type: image

As a database, DPLA offers less search functionality regarding filtering types of images; however, in practice the vast majority of images from libraries on this subject were digitized historical photograph collections or, less commonly, prints and cartographic materials. The “Location” facet in DPLA is also not as precise as in Artstor, as there is no disambiguation regarding whether the location specified is the place of origin of the creator, the location of the holding institution, or even the location depicted in photographs. Therefore, cases were selected from the list of contributing institutions based on their size (i.e., large or small) and their location, which the author determined based on her knowledge of the institutions and/or whether the state, province, or city was listed in the institution’s name.

A sample size of twenty case studies was a manageable number, but data for this step was limited to what institutions make available on their websites. Cataloguing staff was contacted by the researcher to provide information; to increase the likelihood of a high response rate, the questionnaire was deliberately kept short and participants were given clear information regarding the contents and purpose of the questionnaire.

3.5 Ethics Concerns

The first two steps of data gathering posed very little ethical issues given that freely available information constituted the sample; however, given the use of human participants in the questionnaire section, there were several ethical principles to consider which Bryman (2012) outlined, which are: harm to participants, lack of informed consent, invasion of privacy, and use of deception. Overall, the questionnaire posed little risk to participants, who were not harmed or deceived, and who were given ample information about the contents and purpose of the questionnaire before giving consent.

Participants were also notified that they may skip could question which they were not comfortable answering.

Because participants offered information and opinions about their place of work, their privacy was protected by anonymizing and encrypting questionnaire data. To further protect their privacy, all participant contact information, names, and the key matching numerical identifiers to case study institution names are stored according to the mandates of the University of British Columbia's Behavioural Research Ethics Board. Participants were also assured that their responses were in no way be passed on to their employer, and are not identifiable based on their place of employment, as the names of institutions are not reported in this study.

Given this description of the research methodologies employed by this study, the following chapter describes the process of data gathering and the challenges experienced during the practical application of these methods.

4. Methodology Applied

The following is a narrative description of the execution of the study which reveals the complexities and challenges of the proposed methodology. Many of the findings during the application of the methodology effect the conclusions reached; indeed, while executing this study the author gained an understanding of the subject anecdotally and through reflection, rather than strictly through the collection of data. Some of her conclusions are shaped by this observation, even though the research tools designed beforehand did not allow her to gather this data in a systematic way. As will be discussed in section 8.1, some of these anecdotal observations not accounted for in the methodology could yield further study. During this chapter, the author will refer to herself as “I” as many of these findings and observations are subjective in nature and cast light on the author’s attempt to gather data as consistently and objectively as possible, given the limitations of both the methodology and human interpretation.

4.1 Data Gathering

In order to derive representative cases for quota sampling, a sense of the population had to be elicited. For example, it would be impossible to describe a library as “large” or “small” without knowing what an average-sized library collection of Indigenous visual culture might entail. The limitations of using APIs to characterize the population became clear; while they provided access to the digital holdings of many libraries and museums, this was by no means the sum of all cultural heritage institutions in the United States and Canada. Furthermore, this is additionally limited by the digital holdings of those institutions. I recognized, however, that without the ability to gain access to the physical holdings of 20 libraries and museums, this limitation was an immutable one.

The next limitation, and perhaps the most pertinent, was the initial proposal to use Artstor exclusively to derive case studies. I used Artstor’s API to extract image metadata as a JSON response, which was

then cleaned up using OpenRefine. A challenge to this process was that while Artstor offers images from libraries, archives, and museums, the API produced results that were much narrower than expected, both in terms in the types of institutions represented and the amount spread across the results. Additionally, the API responses did not include collection or institution names, so this issue became evident only after a lengthy process of manually applying institution names from the results page on the Artstor site.

It was decided, then, that the Digital Public Library of America should be used to get a sense of the library population; with a robust API and holdings of “over 7 million digitized cultural heritage items from 1,200 contributing institutions across the United States” (Digital Public Library of America, 2017, p. 3), DPLA provided the easiest and most time-effective way to get a large amount of data from a range of institutions. The obvious limitation with this method, of course, was its focus on American institutions over Canadian. Additionally, a major difference between Artstor and DPLA is the categorization of digital objects; while using Artstor meant that I could narrow my search for genres such as “Decorative Arts, Utilitarian Objects and Interior Design” and “Sculpture and Installations”, in DPLA I could narrow my search to “Images” and “Physical Objects”. In practice, this lack of specificity was not immediately problematic because the vast majority of materials in these two categories were historical photographs. Indeed, despite the inclusion of “Physical Objects” in the search, after the selection of case studies and the selection of a sample group of images from each case, I believe that every image analyzed from a library was photographic, or at least two-dimensional, in nature.

Additionally, unlike Artstor, DPLA’s location filter is ambiguous regarding its exact meaning; that is to say, whether it allows the user to select institutions based on where they are located or based on the provenance of the image or object. Therefore, selecting “United States” and “Canada” in DPLA can still produce results from, for example, a large museum and research center in the United States that

contain historical photographs of Indigenous subjects from North Africa. In this case, the creator and holding institution are American, the metadata contains the keyword “Indigenous”, but the photographs had to be removed from the API results because they were not germane to the study and not indicative of the desired population. Therefore, the reliance on keyword searching was unwieldy, and in particular produced more false results in DPLA than Artstor.

In a small handful of cases, collections of historical photographs retrieved portraits of Indigenous subjects alongside a few rare images of non-Indigenous subjects dressed in “Native American” costume, or did in fact retrieve digital surrogates of prints of modern and contemporary Indigenous artists. This can also be ascribed to the unwieldiness of keyword searching, and was ironic in practice because the very problem I was gathering data about—the semantic challenges of translating image to text for user retrieval—caused those exact problems when gathering that very data. While these images were outside the scope of the study, it was difficult in practice to manipulate the DPLA API in particular to retrieve only images that were within this scope. When I encountered these “out of scope” images, I attempted to randomly select another image from the collection that would be more germane to the study. This was challenging, however, because it was difficult based on the API responses to extrapolate the content of these images before encountering the images themselves, and to have accounted for these out of scope images at the outset of gathering the data sample to be analyzed. To my relief, these accounted for a small proportion of the images surveyed.

API results were processed and cleaned up, and the average number of items per museum and library were calculated separately since the number of items that constituted a “large museum” was slightly different than a “large library”. It quickly became apparent, however, that I could not review every image from every case study. After determining the time that it would take to conduct content analysis for one image on average, I determined that a sample size with a 5% margin of error and 80% confidence level would produce a reasonable amount of images to analyze, totaling 1095. I used

an online randomization tool (randomizer.org) to select images at random, gave each a unique numerical identifier, and began analysis. While I chose to code my results using Excel, the codebook was imported to SPSS in order to facilitate statistical analysis.

Rather than analyzing metadata on Artstor or DPLA's user-facing sites, which had metadata fields mapped to the database's schema rather than the originating institutions', each institutional collection portal or database was consulted to determine subject metadata. Indeed, a quick observation of the DPLA and Artstor API results reveals the inconsistency across the hundreds of fields that are then standardized and mapped to a much smaller number of user-facing fields; for example, subject and descriptive metadata was often mapped to several different fields and under varying labels. Using these results or the standardized version on DPLA or Artstor posed the risk of missing a field or the mapping of one descriptive field to another.

Once the research was approved by the Behavioural Research Ethics Board, survey participants were contacted immediately in order to give them ample time to complete and return the questionnaire. According to Bryman (2012), this style of questionnaire—which is not unlike a postal questionnaire because it is unsolicited by respondents—can have low response rates. In order to improve response rates, participants were given a detailed introductory email and a follow up message after the initial message, and the questionnaire itself was written so as to be as short as possible to prevent fatigue, and is comprised mostly of closed questions so that participants need only tick a box (Bryman, 2012). Additionally, while gathering qualitative data through this instrument allowed participants to provide additional clarifying information, due to the compressed timeline of this study, the process of following up with participants to ensure that their qualitative responses are used correctly was not feasible. The questionnaire was created and made available using FluidSurveys, which hosts survey data “locally, on Canadian servers, making FluidSurveys an excellent option for conducting surveys that require the collection of private or sensitive data” (UBC Arts ISIT, n.d., n.p.).

All contact with participants was conducted via email, and potential participants were sent an introductory email which explained the research, why they were contacted, and inquired whether the recipient was interested in participating, or if they could refer the researcher to an interested or more appropriate party at their institution. Emails were sent from the author's institutional (University of British Columbia) email address. This method of soliciting responses had some drawbacks; although survey responses did exceed my expectations in terms of volume, all responses recorded came from full-time staff members. This is likely due the method of establishing contact with participants; first by searching institutions' websites to find the seemingly correct point of contact—although in some cases this was difficult to deduce based on varying professional titles between organizations, or the differential between staff in charge of special collections or in charge of digital initiatives—and secondly by sending a broad email to a generic email address, which usually was kindly forwarded on to the staff in charge of digital collections, rather than volunteers, student assistants, or basic cataloguing staff. Without understanding how each institution structures their digital collections staff and workflows, however, it would be difficult to find a method to pinpoint casual workers or volunteers that are engaged in metadata creation.

The introductory email could have asked recipients to forward the information to casual workers under the recipients' supervision (instead of the general phrasing used to ask recipients to forward the message along to the appropriate parties), though I feared that this method would make those casual workers or volunteers feel a sense of obligation, having been handed down an activity by their supervisor. Regardless, the survey responses received do reflect a good deal of variety, and the majority of case studies have at least one survey response that represents a full time staff member's understanding of practices and policies for metadata creation; again, this response exceeded my expectations and I am deeply grateful for each participant that took time to provide responses.

Once participants agreed to participate, they were sent a link which lead to the informed consent page, which stated that “their participation was voluntary; they were free to refuse to answer any of the questions; they could withdraw from the [questionnaire] at any time; they could withdraw their data within two weeks of the [questionnaire]” (Bryman, 2012, p. 123). The ability to leave questions blank was meant to suit participants who felt uneasy about answering questions about their place of work; however, participants were informed clearly that their responses would be anonymized and not shared with anyone, including their employer and that the institution that they work at would not be identified.

4.1.1 Case study coding.

Once the average size of libraries and museums were established, I selected case studies from each population, with an effort to select a range of institution types. For example, I selected public, private, and special libraries, as well as art museums with art and anthropological focuses. While many of them are located in United States according to the limitations of DPLA and availability of images from Canadian museums, there are institutions located in both countries. It is also important to note that many of the images analyzed from libraries come from archival holdings in those libraries, but only item-level records were analyzed, not finding aids or other forms of archival description.

I was unsure of the likelihood of finding relevant information regarding institutional activities to engage with Indigenous communities or insert Indigenous perspectives in the collection, but was pleased to find enough to justify the use of institutional websites for content analysis. Occasionally this included linked websites from the institutional site; these affiliated websites were coded accordingly. Overall, case study coding offered fewer technical and logistical challenges than image coding, such as determining appropriateness, specificity, and the disparity in the application of subject terms between libraries and museums, as will be discussed below.

4.2 Coding Appropriateness, Inappropriateness, and Neutrality

Perhaps the most persistent challenge and ethical difficulty for myself as a researcher was the process of coding image subject metadata as “appropriate”. My identity as a person of Western European origin made me not only uneasy about determining the appropriateness or inappropriateness of certain language, but unqualified to do so as well. Ironically, I felt that my impetus to do so was remarkably inappropriate, and I hope in future that more worthy and qualified persons may take up this work if so compelled.

Despite this hesitance, I opted to code this field in a way that I felt was conservative. To begin, I felt outright that the Library of Congress Subject Headings term “Indians of North America” was inappropriate, due to the historical associations with the terminology. I considered, however, the historical precedent of reclaiming inaccurate and offensive language, such as the naming of the American Indian Movement (AIM) during the twentieth century. Reflecting on the notion of Indigenous warrant, which is used by Doyle, Lawson, and Dupont, “in identifying Indigenous self-representation of names of nations, tribal councils and other forms of governance, as well as contemporary terminology for issues and movements” (2015, p. 115), the importance of agency and the ability to name oneself was an important factor for determining the appropriateness of the term “Indian” in context. What is not appropriate, therefore, is the Library of Congress’s use of the term; this is radically different from the ability of the AIM to name itself. Other terms which are intended to be offensive and derogatory were found in subject fields, albeit rarely; unable to find an example where these terms were co-opted by Indigenous groups or actors, I coded them as inappropriate.

Neutral terminology, therefore, are words which state the names of things as objectively as possible. This usually meant the identification of figurative representation, which in practice bore a strong resemblance to coding the terms denoting *Ofness*. Naming a specific type of clothing or object could be considered neutral, and the term in LCTGM “Indigenous peoples” was coded as neutral; although I

considered this to be a more appropriate identifier than “Indians of North America”, acknowledging that the coding structure of inappropriate-neutral-appropriate allows for some words to carry more weight than others, I determined that naming the subjects of historical portraits, for example, as “Indigenous peoples” was a statement of fact. In cases where a specific nation was identified and I was unable to determine the preferred name for that community, I coded it as neutral terminology. In a handful of cases where the nation was identified in the language of its people or cited the preference of the nation, I coded it as appropriate.

About halfway through the process of coding image subject metadata, it occurred to me that I had been able to identify many images with inappropriate language, neutral language, but many less with appropriate language. I believe that this is indicative of several factors: first, that many controlled vocabularies that are used by cultural heritage institutions do in fact carry bias in the language that they employ; second, that I as a researcher am better equipped and more comfortable identifying when the subject metadata gets it “wrong”, but due to my identity am less sure of what would be “right” to the originating culture or community of an ethnographic object or portrait subject; and third, that there is not an easy answer for what is in fact “right”, and that answer is a deeply emotional and context-dependent one.

4.3 Coding “Decolonization”

In the initial proposal for this study, I wished to investigate how institutional efforts to engage with the colonial biases present in professional practice, controlled vocabularies, etc. or to pursue partnerships with Indigenous communities effected image subject metadata. While the survey asked museum and library professionals to identify whether their institution participates in decolonization initiatives themselves, in the institutional content analysis codebook I chose to label these types of activities that I found documented in institutional websites as “decolonization initiatives”. When it

came to actually coding these activities, and discovering the multiplicities of ways that institutions bring Indigenous voices into their spaces, both physically and in their administrative practices, I began to feel a discomfort around my grouping of these activities together under the umbrella of “decolonizing”.

I considered what Tuck and Yang said: “There is a long and bumbled history of non-Indigenous peoples making moves to alleviate the impacts of colonization. The too-easy adoption of decolonizing discourse (making decolonization a metaphor) is just one part of that history and it taps into pre-existing tropes that get in the way of more meaningful potential alliances” (2012, p. 3). As the authors predicted, this reflection did cause discomfort, embarrassment, and feelings of being implicated (Tuck & Yang, 2012). So rather than using decolonization as a metaphor, in the course of this paper I have chosen to instead refer to these institutional and individual practices that I have coded using language that reflects what they are: moves to repatriate objects, bring Indigenous voices and creators into institutional contexts, support Indigenous scholars financially and/or in their research, or efforts to remove colonial bias from metadata. Rather than making myself an arbiter of whether these activities were decolonizing or using the term metaphorically, over the course of this study I eschewed the use of the term “decolonization”, and although I could not retroactively remove them from my research instruments, in my interpretation of my findings, will describe what these institutional activities are constituted *Of* rather than make assumptions regarding what they are *About*.

4.4 Considering Specificity

If, in fact, images can be “simultaneously generic and specific” (Shatford, 1986, p. 47), in practice individual subject terms can also be generic and specific. In practice, subject headings exist on a “continuum” of specificity in different contexts (Enser, 2008a, p. 10). For example, “eagle” is more specific term than “bird”, but is it possible to identify specific eagles in practice? Or, on the spectrum

of “Indigenous Peoples”-“Indians of North America”-“Hopi people”, how does one code “Indians of North America”? Determining how to code these more flexible terms, like “eagle” or “Indians of North America” was the product of iteration during the coding process. The dearth of subject terms that actually identified specific nations or communities led to the decision that “Indians of North America” would be coded as specific because it does identify a specific group of people, and “eagle” was coded the same because of a similar lack of more specific subject terms.

In most cases this did not change the coding of the *Of/About*, generic/specific fields; in many cases, other less questionable terms existed that would have otherwise been coded in the same way.

However, this made the “SubjectFrequency” field more arbitrary than others. Although data was gathered for this field, it will be used very little for discussion and analysis. For example, in some cases there were equal amounts of *Of Specific* and *Of Generic* terms where there were either an even number of subject terms spread equally between two categories, or one term that was not explicitly generic or specific and would be a “tiebreaker” where the other terms were spread equally between two categories. The limitations of this field were revealed while attempting to code in these types of scenarios, and early in the process it was determined that it would have little utility due to its arbitrary determination in some cases.

4.5 Considering Subject Access in Context

I can confirm with my data and my own anecdotal observation that the notion of “subject matter” is distinctly library-centric. When coding images from museums, there were some cases that had no descriptive metadata offered at all; others gave detailed description using provenance information, culture of origin, materials and physical traits, or object types. While these fields were rich and descriptive in nature, they were not offered as the “subject”, or used free text description. The effect of this differing use of descriptive fields will be discussed in section 7.1, but it is important to note

that they were not coded as subject fields, and could not be analyzed as such according to the design of the study.

This other type of descriptive metadata (physical traits, materials that composed objects, culture of origin) was captured to some extent using the Controlled Vocabulary/Free Text Description field. This field counted any kind of metadata describing the subject matter of the image; for example, controlled vocabulary terms describing the component materials of an ethnographic object, or a free-text description field that described the contents of a digitized photograph. Although the digital surrogates with no subject fields were not coded in other fields (such as appropriateness of language), some of these other types of subject matter description were captured, whether they used controlled vocabularies, free text description, or some combination of the two, as well as existing alongside subject terms or, in some cases, not. From this arose the distinction made between subject fields—which are labeled as such—and subject matter description, which can include metadata from several fields, such as description, material, etc.

5. The Cases: An Overview

The following is a list of all twenty case studies with brief descriptive information and a breakdown of their outreach initiatives, collections of Indigenous visual culture, and information provided by survey respondents, where applicable. The names and additional identifying characteristics of institutions are not included to protect the confidentiality of survey respondents.

5.1 Case One

Case 01 is a museum with a large collection of Indigenous visual culture; 34 objects were discovered using Artstor, out of which 27 were analyzed. Case 01 is affiliated with an archive, and has no apparent affiliations with universities, councils, consortia, or other bodies. Analysis of 01's website did not reveal any outreach or repatriation efforts, and its online collection contained no subject terms. All of the digital objects analyzed did have other descriptive metadata, all of which used controlled vocabularies exclusively and no free text description whatsoever.

The survey participant from case 01 is a full-time staff member with 4-5 years of cataloguing experience, and they currently work alone on this activity. They rated their knowledge on the following topics:

Table 5.1. Cataloguer knowledge survey results, case 01

How knowledgeable are you on the following topics?	Response
4a. Indigenous cultures and traditional knowledge	Neutral
4b. Decolonization efforts of information organizations	Slightly familiar
4c. Collaborative projects with Indigenous communities	Slightly familiar
4d. Colonial biases in controlled vocabularies such as LCSH	Slightly familiar

Additionally, they rated their institution on the following criteria:

Table 5.2. Institutional practices survey results, case 01

Please rate the following statements regarding your institution.	Response
5a. My institution participates in decolonization initiatives.	Disagree
5b. My institution works with local Indigenous communities in order to derive appropriate descriptive terminology and cataloguing policies.	Strongly disagree
5c. My institution trains all employees in cultural biases and promotes sensitive and accurate language use.	Disagree
5d. My institution's participation in decolonization initiatives is affected by budgetary constraints.	Strongly disagree

They reported that their institution does not use social tagging on their images and does not have a handbook for preparing image metadata. According to the survey participant, case 01 does provide subject access to users.

5.2 Case Two

Case 02 is a library with a large collection of Indigenous visual culture and no apparent affiliations to other institutions aside from participation in a consortium, and no outreach or repatriation efforts that could be gleaned from the website. 179 images were discovered using DPLA, out of which 86 were analyzed. The online collection allows users to tag images and every image had subject terms associated with it, as follows:

Table 5.3. Image subject headings, case 02

Type	Number of images with subject type	Percent of images with subject type
<i>Of generic</i>	83/86	96.5%
<i>Of specific</i>	61/86	70.9%
<i>About generic</i>	16/86	18.6%
<i>About specific</i>	2/86	2.3%

These terms include neutral language 100% of the time, though in 54.7% (47 occurrences) of images this included inappropriate language as well. 90.7% of images (78 occurrences) used controlled vocabulary terms exclusively for description, while the remaining 9.3% of images (eight occurrences) used a combination of controlled vocabulary terms and free text description, meaning that all images were described using controlled vocabularies in some form.

No survey results were recorded from this case.

5.3 Case Three

Case 03 is also a library with a large collection of Indigenous visual culture; 691 images were discovered using DPLA, out of which 133 images were analyzed. It has affiliations with archives and consortia as well museums and a larger historical society, and this broader system of institutions participates in initiatives such as repatriation efforts, and community and educational programming for Indigenous community members in the region. 03's online collection has social tagging enabled, and all images surveyed contained subject terms. A detailed breakdown of subject terms follows:

Table 5.4. Image subject headings, case 03

Subject type	Number of images with subject type	Percent of images with subject type
<i>Of generic</i>	133/133	100%
<i>Of specific</i>	133/133	100%
<i>About generic</i>	2/133	1.5%
<i>About specific</i>	0/133	0%

While all images' subject metadata contained neutral language, 96.2% of images (128 occurrences) also contained inappropriate language in their subject fields, and zero images had appropriate terms in their subject metadata. Finally, all images were described using a combination of free text description and controlled vocabulary terms.

The survey participant from case 03 is a full-time staff member with 2-3 years of cataloguing experience, and they currently work alone on this activity. They rated their knowledge on the following topics:

Table 5.5. Cataloguer knowledge survey results, case 03

How knowledgeable are you on the following topics?	Response
4a. Indigenous cultures and traditional knowledge	Not familiar
4b. Decolonization efforts of information organizations	Not familiar
4c. Collaborative projects with Indigenous communities	Not familiar
4d. Colonial biases in controlled vocabularies such as LCSH	Not familiar

Additionally, they rated their institution on the following criteria:

Table 5.6. Institutional practices survey results, case 03

Please rate the following statements regarding your institution.	Response
5a. My institution participates in decolonization initiatives.	Don't know
5b. My institution works with local Indigenous communities in order to derive appropriate descriptive terminology and cataloguing policies.	Don't know
5c. My institution trains all employees in cultural biases and promotes sensitive and accurate language use.	Disagree
5d. My institution's participation in decolonization initiatives is affected by budgetary constraints.	Don't know

They confirmed that their institution does use social tagging on their images and has a handbook for preparing image metadata. According to the survey participant, case 03 does provide subject access to users, and uses LCSH and LCTGM as controlled vocabularies, as well as locally-derived terminology. Finally, they reported the following regarding their institution's handbook and guidelines for cataloguing:

Table 5.7. Cataloguing guidelines survey results, case 03

Please rate the following statements regarding your institution's training materials.	Response
12a. Instructions are clearly laid out and understandable.	Neutral
12b. There are sufficient guidelines for describing specific types of images.	Neutral
12c. Guidelines provide additional instructions for describing culturally sensitive images.	Neutral
12d. My institution's policies for describing images enable culturally appropriate and	Neutral

Please rate the following statements regarding your institution’s training materials.	Response
accurate use of language.	
12e. Guidelines include additional information for describing material culture or images from non-Western cultures.	Neutral

5.4 Case Four

Case 04 is a museum with a large collection of Indigenous visual culture; this includes 37 digital surrogates discovered using Artstor. Although 04 did not have any affiliations visible on their website, they do participate in repatriation efforts. Case 04’s online collection does not have social tagging enabled. Out of 28 images observed, 20 of them (71.4%) had subject metadata present, as follows:

Table 5.8. Image subject headings, case 04

Subject type	Number of images with subject type	Percent of images with subject type
<i>Of generic</i>	17/20	85.0%
<i>Of specific</i>	0/20	0.0%
<i>About generic</i>	13/20	65.0%
<i>About specific</i>	0/20	0.0%

All images with subject terms used neutral language exclusively, with no inappropriate or appropriate terms. Of all 28 images observed, one used controlled vocabulary exclusively for description (3.6% of occurrences), 19 used a combination of controlled vocabulary terms and free text description (67.9% of occurrences), and eight had no metadata fields containing subject matter description whatsoever (28.6% of occurrences).

No survey results were recorded from this case.

5.5 Case Five

Case 05 is a library with a large collection of Indigenous visual culture; it is, in fact the largest collection surveyed in this study. In total 813 images were discovered using DPLA. It is an online collection affiliated with consortia, a university, archives, and several Indigenous councils. It is also affiliated with other educational bodies through its relationship with a research center that produces publications. Case 05 participates in a range of initiatives including collaborative collection development, support of land and water claims for local Indigenous communities, and the support of Indigenous scholars-in-residence. The online collection has social tagging enabled, and subject metadata exists for all 137 images analyzed, as follows:

Table 5.9. Image subject headings, case 05

Subject type	Number of images with subject type	Percent of images with subject type
<i>Of generic</i>	121/137	88.3%
<i>Of specific</i>	137/137	100.0%
<i>About generic</i>	4/137	2.9%
<i>About specific</i>	2/137	1.5%

The appropriateness of language used fell under the category “Some inappropriate, some neutral” in 94.2% of images, or 129 occurrences. However, in five occurrences (3.6% of images), all subject terms were appropriate; in one occurrence (0.7% of images) some terms were inappropriate while others were appropriate; and in two occurrences (1.5% of images) only neutral language was used in the subject metadata, and there were no occurrences of all inappropriate or a combination of inappropriate/neutral or appropriate/neutral. In all 137 images, however, a combination of free text description and controlled vocabulary terms were used to describe the subject matter of images.

No survey results were recorded from this case.

5.6 Case Six

Case 06 is a library with a large collection of Indigenous visual culture that is affiliated with a consortium. 551 images from case 06 were discovered using DPLA. Case 06 has a genealogy department that includes a focus on Native American heredity in the region. Their online collection did have social tagging enabled and subject metadata existed for 126 images observed.

Table 5.10. Image subject headings, case 06

Subject type	Number of images with subject type	Percent of images with subject type
<i>Of generic</i>	112/126	88.9%
<i>Of specific</i>	125/126	99.2%
<i>About generic</i>	29/126	23.0%
<i>About specific</i>	9/126	7.1%

125 out of 126 images had neutral language in the subject field; 34 images (27.0%) had neutral language exclusively, while 91 (72.2%) had a combination of neutral and inappropriate language. The one remaining image, which composed 0.8% of all observed, used some inappropriate and some appropriate language. In total, 92 images out of 126 (73.0%) had some form of inappropriate language in the subject headings. All 126 images were described using a combination of free text description and controlled vocabulary terms.

The survey participant from case 06 is a full-time staff member with 6+ years of cataloguing experience, and they currently work on a team of 4. They rated their knowledge on the following topics:

Table 5.11. Cataloguer knowledge survey results, case 06

How knowledgeable are you on the following topics?	Response
4a. Indigenous cultures and traditional knowledge	Slightly familiar
4b. Decolonization efforts of information organizations	Not familiar
4c. Collaborative projects with Indigenous communities	Not familiar
4d. Colonial biases in controlled vocabularies such as LCSH	Knowledgeable

Additionally, they rated their institution on the following criteria:

Table 5.12. Institutional practices survey results, case 06

Please rate the following statements regarding your institution.	Response
5a. My institution participates in decolonization initiatives.	Strongly disagree
5b. My institution works with local Indigenous communities in order to derive appropriate descriptive terminology and cataloguing policies.	Strongly disagree
5c. My institution trains all employees in cultural biases and promotes sensitive and accurate language use.	Strongly disagree
5d. My institution's participation in decolonization initiatives is affected by budgetary constraints.	Neutral

They confirmed that their institution does not use social tagging on their images and does not have a handbook for preparing image metadata. According to the survey participant, case 06 does provide subject access to users.

5.7 Case Seven

Case 07 is a museum with a large collection of Indigenous visual culture; in total, 50 digital surrogates were discovered using Artstor. Case 07 has affiliations to an archive and a consortium, and analysis of 07's website did not reveal other affiliations or outreach initiatives with Indigenous communities. Case 07's online collection does not allow social tagging and no subject terms were identified in the object records of the 39 digital surrogates observed. Images in general were described using free text description; in only one occurrence (2.6% of images) there was no subject matter description in any form, while the remaining 38 occurrences (97.4% of images) were described using free text fields.

No survey results were recorded from this case.

5.8 Case Eight

Case 08 is a museum with a small collection of Indigenous visual culture; this includes 17 images that were discovered using Artstor. The website revealed an affiliation with an archive, but no other relationships or initiatives with Indigenous communities. Case 08's online collection does not allow social tagging and no subject terms were identified in the object records of the 15 digital surrogates observed. In fact, no subject matter descriptive fields (i.e., free text description or controlled vocabulary terms in other descriptive fields) were observed.

The survey participant from case 08 is affiliated with the museum's library rather than collections or registrar staff; however, their results were gathered as a point of reference. They are a full-time staff member with 6+ years of cataloguing experience, and they currently work on a team of three cataloguing library materials. They rated their knowledge on the following topics:

Table 5.13. Cataloguer knowledge survey results, case 08

How knowledgeable are you on the following topics?	Response
4a. Indigenous cultures and traditional knowledge	Not familiar
4b. Decolonization efforts of information organizations	Not familiar
4c. Collaborative projects with Indigenous communities	Not familiar
4d. Colonial biases in controlled vocabularies such as LCSH	Not familiar

Additionally, they rated their institution on the following criteria:

Table 5.14. Institutional practices survey results, case 08

Please rate the following statements regarding your institution.	Response
5a. My institution participates in decolonization initiatives.	Don't know
5b. My institution works with local Indigenous communities in order to derive appropriate descriptive terminology and cataloguing policies.	Don't know
5c. My institution trains all employees in cultural biases and promotes sensitive and accurate language use.	Don't know
5d. My institution's participation in decolonization initiatives is affected by budgetary constraints.	Don't know

They confirmed that their institution has a handbook for preparing image metadata and did not indicate whether they use social tagging. According to the survey participant, case 08 does provide subject access to users, and uses LSCH and AAT as controlled vocabularies, as well as locally-

derived terminology. Finally, they reported the following regarding their institution’s handbook and guidelines for cataloguing:

Table 5.15. Cataloguing guidelines survey results, case 08

Please rate the following statements regarding your institution’s training materials.	Response
12a. Instructions are clearly laid out and understandable.	Neutral
12b. There are sufficient guidelines for describing specific types of images.	Neutral
12c. Guidelines provide additional instructions for describing culturally sensitive images.	Neutral
12d. My institution’s policies for describing images enable culturally appropriate and accurate use of language.	Neutral
12e. Guidelines include additional information for describing material culture or images from non-Western cultures.	Neutral

5.9 Case Nine

Case 09 is a library with a large collection of Indigenous visual culture; 272 images were discovered using DPLA. It is affiliated with a university and archives, and most of the images observed are from a specific archive in the library’s holdings. Case 09 is also affiliated with a consortium and a Native American student resource center. Initiatives include grants for Indigenous students, special events and programming in support of Indigenous creators and teachers, and support of the university’s Native Studies academic program. Their online collection does not have social tagging enabled, and all 103 images observed had subject metadata, as follows:

Table 5.16. Image subject headings, case 09

Subject type	Number of images with subject type	Percent of images with subject type
<i>Of generic</i>	97/103	94.2%
<i>Of specific</i>	100/103	97.1%
<i>About generic</i>	30/103	29.1%
<i>About specific</i>	21/103	20.4%

Out of 103 images observed, 102 (99.0%) included some type of neutral language; out of these, 75 (72.8%) were entirely neutral while 27 (26.2%) had inappropriate in addition to neutral language. The one remaining occurrence (1.0%) had both inappropriate and appropriate language. All 103 images were described using a combination of controlled vocabulary terms and free text description.

The survey participant from case 09 is a full-time staff member with 4-5 years of cataloguing experience, and they currently work on a team of about 10+. They rated their knowledge on the following topics:

Table 5.17. Cataloguer knowledge survey results, case 09

How knowledgeable are you on the following topics?	Response
4a. Indigenous cultures and traditional knowledge	Knowledgeable
4b. Decolonization efforts of information organizations	Knowledgeable
4c. Collaborative projects with Indigenous communities	Slightly familiar
4d. Colonial biases in controlled vocabularies such as LCSH	Knowledgeable

Additionally, they rated their institution on the following criteria:

Table 5.18. Institutional practices survey results, case 09

Please rate the following statements regarding your institution.	Response
5a. My institution participates in decolonization initiatives.	Neutral
5b. My institution works with local Indigenous communities in order to derive appropriate descriptive terminology and cataloguing policies.	Agree
5c. My institution trains all employees in cultural biases and promotes sensitive and accurate language use.	Neutral
5d. My institution's participation in decolonization initiatives is affected by budgetary constraints.	Neutral

They confirmed that their institution does not use social tagging on their images and does not have a handbook for preparing image metadata. According to the survey participant, case 08 does provide subject access to users.

5.10 Case Ten

Case 10 is a museum with a small collection of Indigenous visual culture; this is according to the images available on DPLA, where 15 images were discovered. A further perusal of case 10's online collection reveals a rather large collection of images not available on DPL, perhaps due to DPLA's concentration on "library" materials, rather than museum objects. For the purposes of this study and maintaining consistency with the study's methodologies, however, only the images on DPLA were observed.

Case 10 has affiliations with archives and local Indigenous councils, and their website revealed initiatives including repatriation efforts, collaborative collection building with Indigenous community

members, and an Indigenous artist-in-residence program. Their online collection did not have social tagging enabled, although they did have subject metadata for all 14 images observed, as follows:

Table 5.19. Image subject headings, case 10

Subject type	Number of images with subject type	Percent of images with subject type
<i>Of generic</i>	14/14	100.0%
<i>Of specific</i>	14/14	100.0%
<i>About generic</i>	1/14	7.1%
<i>About specific</i>	1/14	7.1%

All images had some type of neutral language used; 13 of these (92.9%) had inappropriate and neutral language in the subject metadata, and the remaining image (7.1%) used just neutral language.

Additionally, 13 occurrences (92.9%) used controlled vocabulary exclusively to describe images, while the remaining image (7.1%) was described using free text and controlled vocabulary terms.

Case 10 is the only case with two respondents, each with different titles and working in different departments. The first participant is a full-time staff member with 6+ years of cataloguing experience, and they currently work on a team of five. They rated their knowledge on the following topics:

Table 5.20. Cataloguer knowledge survey results, case 10 participant 1

How knowledgeable are you on the following topics?	Response
4a. Indigenous cultures and traditional knowledge	Slightly familiar
4b. Decolonization efforts of information organizations	Slightly familiar
4c. Collaborative projects with Indigenous communities	Knowledgeable
4d. Colonial biases in controlled vocabularies such as LCSH	Not familiar

Additionally, they rated their institution on the following criteria:

Table 5.21. Institutional practices survey results, case 10 participant 1

Please rate the following statements regarding your institution.	Response
5a. My institution participates in decolonization initiatives.	Strongly agree
5b. My institution works with local Indigenous communities in order to derive appropriate descriptive terminology and cataloguing policies.	Neutral
5c. My institution trains all employees in cultural biases and promotes sensitive and accurate language use.	Strongly disagree
5d. My institution's participation in decolonization initiatives is affected by budgetary constraints.	Agree

They confirmed that their institution has a handbook for preparing image metadata and does not use social tagging. According to the first survey participant, case 10 does provide subject access to users, and uses Nomenclature as their controlled vocabulary, as well as locally-derived terminology. Finally, they reported the following regarding their institution's handbook and guidelines for cataloguing:

Table 5.22. Cataloguing guidelines survey results, case 10 participant 1

Please rate the following statements regarding your institution's training materials.	Response
12a. Instructions are clearly laid out and understandable.	Disagree
12b. There are sufficient guidelines for describing specific types of images.	Strongly disagree
12c. Guidelines provide additional instructions for describing culturally sensitive images.	Strongly disagree

Please rate the following statements regarding your institution's training materials.	Response
12d. My institution's policies for describing images enable culturally appropriate and accurate use of language.	Disagree
12e. Guidelines include additional information for describing material culture or images from non-Western cultures.	Neutral

The second participant responded similarly to many questions; however, the dissimilarity of some of their responses reveals differences in opinion or perspective between the respondents as well as different training practices that may occur in a single institution. Like their colleague, they are a full-time staff member with 6+ years of cataloguing experience, and they currently work on a team of 15. They rated their knowledge on the following topics:

Table 5.23. Cataloguer knowledge survey results, case 10 participant 2

How knowledgeable are you on the following topics?	Response
4a. Indigenous cultures and traditional knowledge	Not familiar
4b. Decolonization efforts of information organizations	Neutral
4c. Collaborative projects with Indigenous communities	Neutral
4d. Colonial biases in controlled vocabularies such as LCSH	Neutral

Additionally, they rated their institution on the following criteria:

Table 5.24. Institutional practices survey results, case 10 participant 2

Please rate the following statements regarding your institution.	Response
5a. My institution participates in decolonization initiatives.	Strongly agree
5b. My institution works with local Indigenous communities in order to derive appropriate descriptive terminology and cataloguing policies.	Strongly agree
5c. My institution trains all employees in cultural biases and promotes sensitive and accurate language use.	Agree
5d. My institution's participation in decolonization initiatives is affected by budgetary constraints.	Neutral

They confirmed that their institution has a handbook for preparing image metadata, but unlike their colleague, they responded that their institution does use social tagging. According to the second survey participant, case 10 does provide subject access to users, and uses LCSH and AAT as their controlled vocabularies, as well as locally-derived terminology. Finally, they reported the following regarding their institution's handbook and guidelines for cataloguing:

Table 5.25. Cataloguing guidelines survey results, case 10 participant 2

Please rate the following statements regarding your institution's training materials.	Response
12a. Instructions are clearly laid out and understandable.	Neutral
12b. There are sufficient guidelines for describing specific types of images.	Disagree
12c. Guidelines provide additional instructions for describing culturally sensitive images.	Neutral
12d. My institution's policies for describing images enable culturally appropriate and	Strongly agree

Please rate the following statements regarding your institution's training materials.	Response
accurate use of language.	
12e. Guidelines include additional information for describing material culture or images from non-Western cultures.	Disagree

5.11 Case Eleven

Case 11 is a library with a small collection of Indigenous visual culture; 13 images were discovered using DPLA. Case 11 is affiliated with a university, archives, and consortium, and their website did not reveal any initiatives engaging with Indigenous communities. Social tagging is not enabled in their online collection. Of the 13 images observed, all contained *Of* generic and *Of* specific terms, while zero included *About* generic or *About* specific. All images had a mixture of neutral and inappropriate language in the subject field, and all were described with a combination of both controlled vocabulary terms and free text description.

No survey results were recorded from this case.

5.12 Case Twelve

Case study 12 is a museum with a small collection of Indigenous visual culture; in fact, much like Case 10, the collection available on Artstor is relatively small, although the online collection on the museum website actually contains many more objects. In total, six images were discovered on Artstor. Again, only the Artstor image metadata was observed for this study. Case 12 is affiliated with a university, archive, Indigenous council, and consortium, as well as an Indigenous scholarly society. Initiatives include repatriation efforts, collaborative collection management, and grant programs for Indigenous scholars. Their online collection does not have social tagging enabled, and subject metadata was present in four out of six images observed (66.7%); all four of these images used *Of*

generic and *Of* specific terms, and none contained *About* specific or *About* generic terms. Three images (75.0%) contained neutral language in their subject headings, while the one remaining image (25.0%) had a combination of appropriate and neutral language. Of the total six images, five occurrences (83.3%) had descriptive subject metadata using a combination of controlled vocabulary terms and free text description, while the one remaining occurrence (16.7%) had no descriptive subject metadata at all.

No survey results were recorded from this case.

5.13 Case Thirteen

Case 13 is a museum with a large collection of Indigenous visual culture; it is the largest museum collection in the study, and the largest collection in the study overall. In total, 1008 digital surrogates were discovered using Artstor. It is affiliated with Indigenous councils and a research network, and no initiatives to engage with Indigenous communities were present on their website. Social tagging is not enabled in their online collections, and of the 141 images observed, all had subject metadata.

Table 5.26. Image subject headings, case 13

Subject type	Number of images with subject type	Percent of images with subject type
<i>Of</i> generic	141/141	100.0%
<i>Of</i> specific	141/141	100.0%
<i>About</i> generic	1/141	0.7%
<i>About</i> specific	0/141	0.0%

All images were described with neutral language; 137 images (97.2%) were all neutral, while the remaining four images had a combination of inappropriate and neutral language (2.8%). All 141 images were described using only controlled vocabulary terms, with no free text description.

The survey participant from case 13 is a full-time staff member with 6+ years of cataloguing experience, and they currently work alone on this activity. They rated their knowledge on the following topics:

Table 5.27. Cataloguer knowledge survey results, case 13

How knowledgeable are you on the following topics?	Response
4a. Indigenous cultures and traditional knowledge	Slightly familiar
4b. Decolonization efforts of information organizations	Knowledgeable
4c. Collaborative projects with Indigenous communities	Knowledgeable
4d. Colonial biases in controlled vocabularies such as LCSH	Knowledgeable

Additionally, they rated their institution on the following criteria:

Table 5.28. Institutional practices survey results, case 13

Please rate the following statements regarding your institution.	Response
5a. My institution participates in decolonization initiatives.	Agree
5b. My institution works with local Indigenous communities in order to derive appropriate descriptive terminology and cataloguing policies.	Agree
5c. My institution trains all employees in cultural biases and promotes sensitive and accurate language use.	Agree
5d. My institution's participation in decolonization initiatives is affected by budgetary constraints.	Don't know

They confirmed that their institution has a handbook for preparing image metadata and does not use social tagging. According to the survey participant, case 13 does provide subject access to users, and uses AAT and Iconclass as controlled vocabularies, as well as locally-derived terminology. Finally, they reported the following regarding their institution’s handbook and guidelines for cataloguing:

Table 5.29. Cataloguing guidelines survey results, case 13

Please rate the following statements regarding your institution’s training materials.	Response
12a. Instructions are clearly laid out and understandable.	Neutral
12b. There are sufficient guidelines for describing specific types of images.	Neutral
12c. Guidelines provide additional instructions for describing culturally sensitive images.	Agree
12d. My institution’s policies for describing images enable culturally appropriate and accurate use of language.	Neutral
12e. Guidelines include additional information for describing material culture or images from non-Western cultures.	Agree

5.14 Case Fourteen

Case 14 is a museum with a small collection of Indigenous visual culture; this includes 18 images discovered using Artstor. Case 14 has an affiliation with an archive, and the review of their website revealed initiatives such as repatriation efforts, lesson plans on Indigenous visual culture for local schools, and programming in support of Indigenous creators. Their online collection does not have social tagging enabled and none of the images observed had subject metadata. Other descriptive fields, however, used controlled vocabularies exclusively for all 16 images analyzed.

The survey participant from case 14 is a full-time staff member with 6+ years of cataloguing experience, and they did not indicate the size of the team they work on. They rated their knowledge on the following topics:

Table 5.30. Cataloguer knowledge survey results, case 14

How knowledgeable are you on the following topics?	Response
4a. Indigenous cultures and traditional knowledge	Knowledgeable
4b. Decolonization efforts of information organizations	Knowledgeable
4c. Collaborative projects with Indigenous communities	Neutral
4d. Colonial biases in controlled vocabularies such as LCSH	Neutral

Additionally, they rated their institution on the following criteria:

Table 5.31. Institutional practices survey results, case 14

Please rate the following statements regarding your institution.	Response
5a. My institution participates in decolonization initiatives.	Neutral
5b. My institution works with local Indigenous communities in order to derive appropriate descriptive terminology and cataloguing policies.	Neutral
5c. My institution trains all employees in cultural biases and promotes sensitive and accurate language use.	Agree
5d. My institution's participation in decolonization initiatives is affected by budgetary constraints.	Neutral

They confirmed that their institution has a handbook for preparing image metadata and uses social tagging. According to the survey participant, case 14 does provide subject access to users, and uses AAT as a controlled vocabulary, as well as locally-derived terminology. Finally, they reported the following regarding their institution’s handbook and guidelines for cataloguing:

Table 5.32. Cataloguing guidelines survey results, case 14

Please rate the following statements regarding your institution’s training materials.	Response
12a. Instructions are clearly laid out and understandable.	Neutral
12b. There are sufficient guidelines for describing specific types of images.	Neutral
12c. Guidelines provide additional instructions for describing culturally sensitive images.	Neutral
12d. My institution’s policies for describing images enable culturally appropriate and accurate use of language.	Neutral
12e. Guidelines include additional information for describing material culture or images from non-Western cultures.	Neutral

5.15 Case Fifteen

Case 15 is a museum with a small collection of Indigenous visual culture, totaling eight objects discovered using Artstor. It is affiliated with a university, archives, and consortium. Analysis of 15’s website did not reveal any initiatives to engage with Indigenous communities and social tagging was not enabled in its online collections. Of the eight images observed, three included subject metadata. Of these three, all included *Of* generic terms, one image (33.3%) was described using *Of* specific terms, one image (33.3%) was described using *About* generic terms, and zero were described with *About* specific terms. All three images were described using neutral language. All eight images were

described using various combinations of free text description and controlled vocabulary terms in descriptive metadata fields:

Table 5.33. Image descriptive metadata, case 15

Descriptive metadata type	Number of images with metadata type	Percent of images with metadata type
All controlled vocabulary	1/8	12.5%
Only free text description	3/8	37.5%
Controlled terms and free text	1/8	12.5%
No subject matter description	3/8	37.5%

No survey results were recorded from this case.

5.16 Case Sixteen

Case 16 is a library with a small collection of Indigenous visual culture; 28 images were discovered using DPLA. It has affiliations with an archive and a regional Indigenous library. Case 16’s website also revealed practices such as collaborative collection building. Case 16’s digital collections have social tagging enabled, and out of the 25 images observed, all of them had subject headings, as follows:

Table 5.34. Image subject headings, case 16

Subject type	Number of images with subject type	Percent of images with subject type
<i>Of generic</i>	25/25	100.0%
<i>Of specific</i>	23/25	92.0%
<i>About generic</i>	2/25	8.0%
<i>About specific</i>	0/25	0.0%

All images had neutral language used in some way in the subject metadata; in four occurrences (16.0% of images) all of the subject headings used neutral language, while the remaining 21

occurrences (84.0% of images) used a combination of inappropriate and neutral language. The majority of images (18 occurrences, 72.0% of images) were described using controlled vocabulary terms, while seven occurrences (28.0% of images) had subject matter described using a combination of controlled vocabulary terms and free text description.

The survey participant from case 16 is a full-time staff member with 6+ years of cataloguing experience, and who works on a team of two. They rated their knowledge on the following topics:

Table 5.35. Cataloguer knowledge survey results, case 16

How knowledgeable are you on the following topics?	Response
4a. Indigenous cultures and traditional knowledge	Slightly familiar
4b. Decolonization efforts of information organizations	Slightly familiar
4c. Collaborative projects with Indigenous communities	Slightly familiar
4d. Colonial biases in controlled vocabularies such as LCSH	Knowledgeable

Additionally, they rated their institution on the following criteria:

Table 5.36. Institutional practices survey results, case 16

Please rate the following statements regarding your institution.	Response
5a. My institution participates in decolonization initiatives.	Disagree
5b. My institution works with local Indigenous communities in order to derive appropriate descriptive terminology and cataloguing policies.	Disagree

Please rate the following statements regarding your institution.	Response
5c. My institution trains all employees in cultural biases and promotes sensitive and accurate language use.	Disagree
5d. My institution's participation in decolonization initiatives is affected by budgetary constraints.	Disagree

They confirmed that their institution has a handbook for preparing image metadata and does not use social tagging. According to the survey participant, case 16 does provide subject access to users, and uses LCSH, LCTGM, AAT, Bilingual Index, and Queens Library Subject Headings as controlled vocabularies, as well as locally-derived terminology. Finally, they reported the following regarding their institution's handbook and guidelines for cataloguing:

Table 5.37. Cataloguing guidelines survey results, case 16

Please rate the following statements regarding your institution's training materials.	Response
12a. Instructions are clearly laid out and understandable.	Agree
12b. There are sufficient guidelines for describing specific types of images.	Agree
12c. Guidelines provide additional instructions for describing culturally sensitive images.	Disagree
12d. My institution's policies for describing images enable culturally appropriate and accurate use of language.	Disagree
12e. Guidelines include additional information for describing material culture or images from non-Western cultures.	Disagree

5.17 Case Seventeen

Case 17 is a library with a small collection of Indigenous visual culture; 47 images were discovered using DPLA, out of which 37 were observed. Case 17 is affiliated with a university, archives, and consortium, and observation of their website did not reveal any initiatives to engage with Indigenous communities. Social tagging is enabled in their online collections, and all of the images observed had subject metadata, as follows:

Table 5.38. Image subject headings, case 17

Subject type	Number of images with subject type	Percent of images with subject type
<i>Of generic</i>	34	91.9%
<i>Of specific</i>	35	94.6%
<i>About generic</i>	6	16.2%
<i>About specific</i>	0	0.0%

All 37 images had neutral language used at least once in their subject headings; five occurrences (13.5% of images) had a combination of inappropriate and neutral terms, and the remaining 32 occurrences (86.5% of images) had all neutral language in the subject headings assigned. All 37 images had subject matter described using a combination of controlled vocabulary terms and free text description.

The survey participant from case 17 is a full-time staff member with 6+ years of cataloguing experience, and who works on a team of 12. They rated their knowledge on the following topics:

Table 5.39. Cataloguer knowledge survey results, case 17

How knowledgeable are you on the following topics?	Response
4a. Indigenous cultures and traditional knowledge	Neutral
4b. Decolonization efforts of information organizations	Neutral
4c. Collaborative projects with Indigenous communities	Neutral
4d. Colonial biases in controlled vocabularies such as LCSH	Slightly familiar

Additionally, they rated their institution on the following criteria:

Table 5.40. Institutional practices survey results, case 17

Please rate the following statements regarding your institution.	Response
5a. My institution participates in decolonization initiatives.	Strongly disagree
5b. My institution works with local Indigenous communities in order to derive appropriate descriptive terminology and cataloguing policies.	Strongly disagree
5c. My institution trains all employees in cultural biases and promotes sensitive and accurate language use.	Strongly disagree
5d. My institution's participation in decolonization initiatives is affected by budgetary constraints.	Strongly disagree

They confirmed that their institution has a handbook for preparing image metadata and does use social tagging. According to the survey participant, case 17 does provide subject access to users, and uses LCSH, LCTGM, and AAT as controlled vocabularies, but does not use a locally-derived

terminology. Finally, they reported the following regarding their institution’s handbook and guidelines for cataloguing:

Table 5.41. Cataloguing guidelines survey results, case 17

Please rate the following statements regarding your institution’s training materials.	Response
12a. Instructions are clearly laid out and understandable.	Agree
12b. There are sufficient guidelines for describing specific types of images.	Agree
12c. Guidelines provide additional instructions for describing culturally sensitive images.	Neutral
12d. My institution’s policies for describing images enable culturally appropriate and accurate use of language.	Neutral
12e. Guidelines include additional information for describing material culture or images from non-Western cultures.	Neutral

5.18 Case Eighteen

Case 18 is a museum with a large collection of Indigenous visual culture; images for 107 digital surrogates were discovered using Artstor. Is it affiliated with a university, archives, Indigenous council(s), consortium, and a research network. Initiatives reported on their website include repatriation efforts, collaborative collection building, grant programs, and Indigenous oral history programs. Social tagging is not enabled in their online collection, and two out of the 54 images observed had subject headings assigned. Both images had only *Of* generic terms used, and both images had subject terms with only neutral language. All 54 of the images observed had subject matter described using a combination of controlled vocabulary terms and free text description.

The survey participant from case 18 is a full-time staff member with 6+ years of cataloguing experience, and who works on a team of about two. They rated their knowledge on the following topics:

Table 5.42. Cataloguer knowledge survey results, case 18

How knowledgeable are you on the following topics?	Response
4a. Indigenous cultures and traditional knowledge	Knowledgeable
4b. Decolonization efforts of information organizations	Knowledgeable
4c. Collaborative projects with Indigenous communities	Knowledgeable
4d. Colonial biases in controlled vocabularies such as LCSH	Slightly familiar

Additionally, they rated their institution on the following criteria:

Table 5.43. Institutional practices survey results, case 18

Please rate the following statements regarding your institution.	Response
5a. My institution participates in decolonization initiatives.	Strongly agree
5b. My institution works with local Indigenous communities in order to derive appropriate descriptive terminology and cataloguing policies.	Strongly agree
5c. My institution trains all employees in cultural biases and promotes sensitive and accurate language use.	Strongly agree
5d. My institution's participation in decolonization initiatives is affected by budgetary constraints.	Agree

They confirmed that their institution has a handbook for preparing image metadata and does not use social tagging. According to the survey participant, case 18 does provide subject access to users, and uses Nomenclature and AAT as controlled vocabularies. They also specified that other controlled vocabularies such as Getty Geographical Thesaurus and self-determined cultural names were used in other metadata fields, noting that their subject lexicons were a weak spot in their cataloguing. Additionally, the participant indicated that case 18 uses a locally-derived terminology. Finally, they reported the following regarding their institution’s handbook and guidelines for cataloguing:

Table 5.44. Cataloguing guidelines survey results, case 18

Please rate the following statements regarding your institution’s training materials.	Response
12a. Instructions are clearly laid out and understandable.	Agree
12b. There are sufficient guidelines for describing specific types of images.	Agree
12c. Guidelines provide additional instructions for describing culturally sensitive images.	Neutral
12d. My institution’s policies for describing images enable culturally appropriate and accurate use of language.	Strongly agree
12e. Guidelines include additional information for describing material culture or images from non-Western cultures.	Strongly agree

5.19 Case Nineteen

Case 19 is a library with a small collection of Indigenous visual culture. 52 images were discovered using DPLA. Case 19 is affiliated with a university, archives, and consortium, and initiatives observed on their website include support of an Indigenous research center. Social tagging is not enabled in their digital collection, and all 39 images observed had subject headings to describe them, as follows:

Table 5.45. Image subject headings, case 19

Subject type	Number of images with subject type	Percent of images with subject type
<i>Of generic</i>	39/39	100.0%
<i>Of specific</i>	38/39	97.4%
<i>About generic</i>	0/39	0.0%
<i>About specific</i>	0/39	0.0%

38 occurrences (97.4%) had subject headings with a combination of neutral and inappropriate language, and the one remaining occurrence (2.6% of images) had only neutral language. All 39 images observed had subject matter described using a combination of controlled vocabulary terms and free text description.

No survey results were recorded from this case.

5.20 Case Twenty

Case 20 is a library with a small collection of Indigenous visual culture; 66 images were discovered using DPLA, out of which 48 were analyzed. Case 20 is affiliated with a university, archives, and consortium, and initiatives reported on their website included a regional oral history archive that includes the stories of members of the local Indigenous community. The digital collection has social tagging enabled, and 39 out of the 48 images observed has subject headings assigned, as follows:

Table 5.46. Image subject headings, case 20

Subject type	Number of images with subject type	Percent of images with subject type
<i>Of generic</i>	16/39	41.0%
<i>Of specific</i>	39/39	100.0%
<i>About generic</i>	0/39	0.0%
<i>About specific</i>	0/39	0.0%

Of generic terms were the type most commonly used in five occurrences (12.8% of images), while *Of* specific were used more frequently in the remaining 34 occurrences (87.2% of images).

Appropriateness of language was spread across three categories, as follows:

Table 5.47. Appropriateness of image description, case 20

Appropriateness of Language	Number of images	Percent of images
All appropriate	17	43.6%
Some inappropriate, some neutral	5	12.8%
All neutral	17	43.6%

Use of controlled vocabularies and free text description in subject matter fields also varied across three categories: 24 images (50.0%) used all controlled vocabulary terms, 23 images (47.9%) were described with a combination of controlled vocabulary terms and free text description, and one image (2.1%) was described using solely free text description.

The survey participant from case 14 is a full-time staff member with 2-3 years of cataloguing experience, and who works on a team of three. They rated their knowledge on the following topics:

Table 5.48. Cataloguer knowledge survey results, case 20

How knowledgeable are you on the following topics?	Response
4a. Indigenous cultures and traditional knowledge	Knowledgeable
4b. Decolonization efforts of information organizations	Knowledgeable
4c. Collaborative projects with Indigenous communities	Knowledgeable
4d. Colonial biases in controlled vocabularies such as LCSH	Knowledgeable

Additionally, they rated their institution on the following criteria:

Table 5.49. Institutional practices survey results, case 20

Please rate the following statements regarding your institution.	Response
5a. My institution participates in decolonization initiatives.	Disagree
5b. My institution works with local Indigenous communities in order to derive appropriate descriptive terminology and cataloguing policies.	Strongly disagree
5c. My institution trains all employees in cultural biases and promotes sensitive and accurate language use.	Agree
5d. My institution's participation in decolonization initiatives is affected by budgetary constraints.	Agree

They confirmed that their institution has a handbook for preparing image metadata and does not use social tagging. According to the survey participant, case 14 does provide subject access to users, and uses LCSH and AAT as controlled vocabularies, as well as locally-derived terminology. Finally, they reported the following regarding their institution's handbook and guidelines for cataloguing:

Table 5.50. Cataloguing guidelines survey results, case 20

Please rate the following statements regarding your institution's training materials.	Response
12a. Instructions are clearly laid out and understandable.	Neutral
12b. There are sufficient guidelines for describing specific types of images.	Disagree
12c. Guidelines provide additional instructions for describing culturally sensitive images.	Disagree
12d. My institution's policies for describing images enable culturally appropriate and accurate use of language.	Disagree
12e. Guidelines include additional information for describing material culture or images from non-Western cultures.	Strongly disagree

6. Analysis

While each case presents common description practices at each institution, a review of the data overall and by institution type and size reveals additional trends and telling incongruities, which will be discussed below. Variables analyzed include the Panofsky/Shatford categories (*Of/About*, generic/specific), appropriateness of terminology, free text description, and institutional characteristics observed online and reported by cataloguing staff.

In total, 1095 images were analyzed, 922 of which had valid subject terms (84.2% of occurrences), with 173 remaining without subject terms (15.8% of occurrences). Due to the proportional size of collections, more images were reviewed from libraries than museums; out of the 1095 reviewed in total, 747 (68.2% of occurrences) were from libraries, while the remaining 348 images analyzed (31.8% of occurrences) were from museum collections. Out of these, 59 images were from small museums (5.4% of occurrences), 289 were from large museums (26.4% of occurrences), 162 were from small libraries (14.8% of occurrences), and 585 were from large libraries (53.4% of occurrences).

Of the 922 images with subject headings, the majority were images from libraries (738 images, 80.0% of occurrences), while the remaining 184 images were from museums (20.0% of occurrences). This included 21 images from small museums (2.3% of occurrences), 163 from large museums (17.7% of occurrences), 153 from small libraries (16.6% of occurrences), and 585 from large libraries (63.4% of occurrences).

Figure 6.1. Total images surveyed, by institution type and size (1095 images)

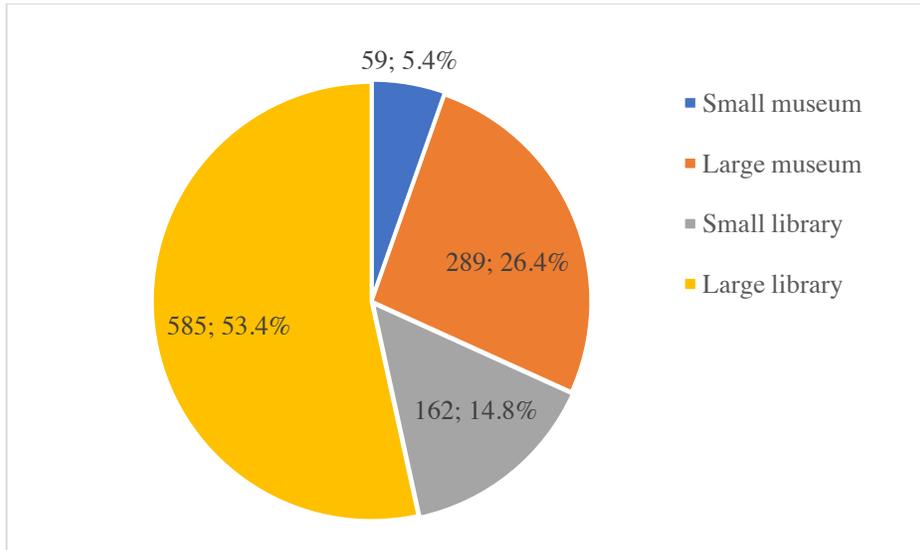
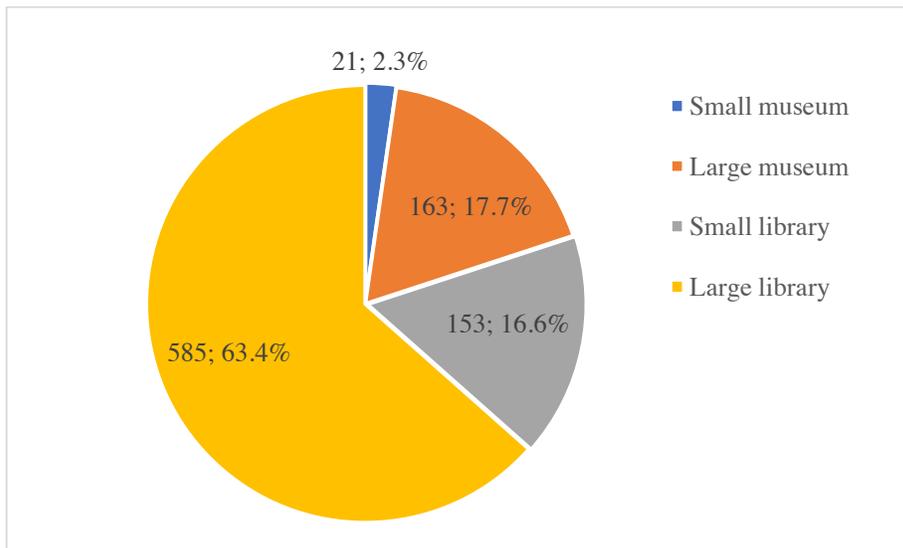


Figure 6.2. Total images with subject headings, by institution type and size (922 images)

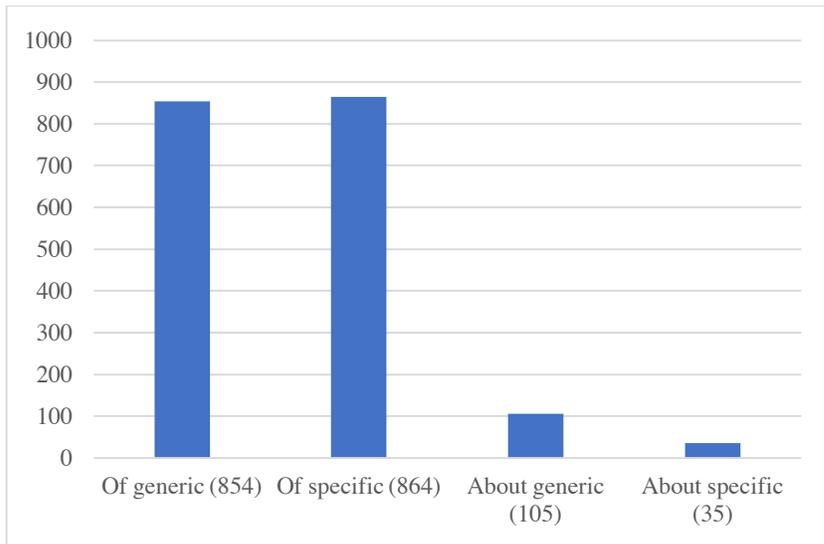


Overall, libraries were more likely to have subject headings (738 out of 747, or 98.8% of library images surveyed), while museums were much less likely (184 out of 348 museum images analyzed, or 52.9%). In order of likelihood to have subject images, large libraries were most likely (585 out of 585 images surveyed, or 100.0%), small libraries were the next most likely (153 out of 162 images

analyzed, or 94.4%), with large museums the third mostly likely (163 out of 289 images observed, or 56.4%), and small museums the least likely to have subject headings (21 images out of 59 observed, or 35.6%). This likelihood for libraries to have subject terms is supported by the literature, which stresses that library cataloguing tends to support bibliographic control while museums focus on administrative functions, and that subject access is more likely in library collections than museums (Timms, 2009; Allen & Bishoff, 2002; Trant 2006; White, 2002). There is no literature to explain why large libraries were more likely to have subject terms than small libraries, or large museums more so than small museums; Jørgensen (1998) and Rossetti (2013) suggested that image indexing is limited by time and budget, so if one assumes that large institutions have more resources to devote to this activity, this could possibly explain the discrepancy.

Of specific terms were used most frequently (864 images, or 93.7% of images observed with subject headings), *Of* generic terms were used the next most frequently (854 images, or 92.6% of images observed with subject headings), *About* generic terms were used the third most frequently (105 images, or 11.4% of images observed with subject headings), and *About* specific terms were used least frequently (35 images, or 3.8% of images observed with subject headings). This is supported by Shatford (1986), who indicated that providing *Of* terms is a task that requires less cataloguer expertise; however, both Shatford (1986) and Alexander and Meehleib (2001) indicated the importance of indexing *About* terms to enable user retrieval. The survey results revealed the frequency of use of AAT, which Alexander and Meehleib (2001) and Harpring (2010) indicated is more precise than LCTGM and more focused on describing physical traits rather than abstract concepts. This might explain the preponderance of *Of* specific, although the margin between *Of* specific and *Of* generic is much narrower than between *Of* and *About* terms regardless of specificity, or between *About* generic and *About* specific terms.

Figure 6.3. Subject heading types observed (922 images)



6.1 *Of*ness

Overall, *Of* terms of any type were used most frequently, regardless of their specificity. Of the 922 images with subject headings, 854 of those had *Of* generic terms (92.6% of occurrences), while 864 had *Of* specific terms (93.7%). This is supported by the literature, which emphasizes using *Of* terms as they require less expert knowledge about the image being catalogued, and by the preponderance of *Of* terms in controlled vocabularies such as Nomenclature and Getty AAT, which provide detailed terms for item types and functionality (Shatford, 1986; Harpring, 2010)

6.1.1 *Of* generic.

In addition to being used frequently across all images, *Of* generic terms were regularly used by libraries and museums, and fairly consistently across both sizes of institutions surveyed. Anecdotally, many of these terms were nonspecific terms that identified figurative representations, such as animals, shapes, types of dress, and types of human figures, such as by gender, age, or their identification as Indigenous. Overall, museums were more likely to use *Of* generic terms than libraries, with small

museums the most likely, large museums the next most likely, large libraries the third most likely, and small libraries the least likely.

Images with no subject headings are not taken into account in the following charts, meaning that the total valid images for this analysis is 922.

Figure 6.4. Images with Of generic subject headings, by institution type (854 images)

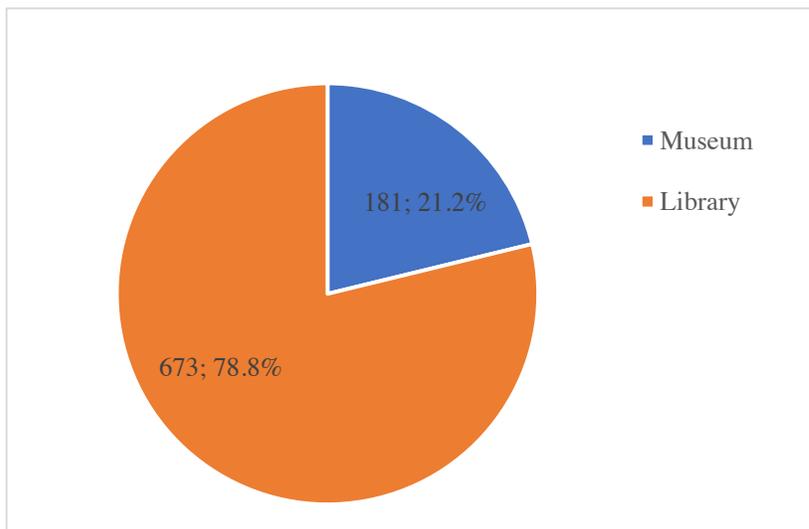


Figure 6.5. Images with Of generic subject headings, by institution type and size (854 images)

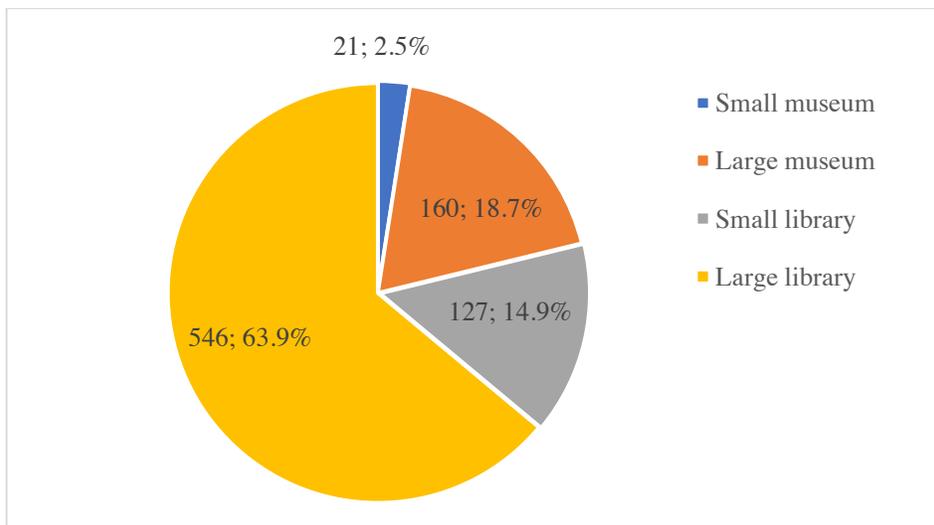


Table 6.1. Of generic terms, museums and libraries

	Museum	Library
Number of images	181/184	673/738
Percent of images	98.4%	91.2%

Table 6.2. Of generic terms, museums and libraries, by size

	Small museum	Large museum	Small library	Large library
Number of images	21/21	160/163	127/153	546/585
Percent of images	100.0%	98.2%	83.0%	93.3%

6.1.2 Of specific.

Of generic terms were used slightly more frequently than *Of* specific (854 and 864 images, respectively), but unlike *Of* generic, they were used more frequently among the libraries surveyed than museums. Overall, small libraries were the most likely to use *Of* specific terms, large libraries the next most likely, small museums the third most likely, and large museums the least likely. It is unclear why libraries would use *Of* specific more often than *Of* generic, though it should be noted that the margin between these two types of *Of* terms as used by libraries is quite narrow. Additionally, why small institutions should be more likely than their larger counterparts to use specific *Of* terms requires additional study.

Generally speaking, most of the *Of* specific terms observed referred to specific tribes or nations of Indigenous peoples in the United States and Canada, or specified that the culture or subjects of the image were Indigenous to North America, rather than limiting the description to their Indigeneity regardless of geography or origin.

Images with no subject headings are not taken into account in the following charts, meaning that the total valid images for this analysis is 922.

Figure 6.6. Images with Of specific subject headings, by institution (864 images)

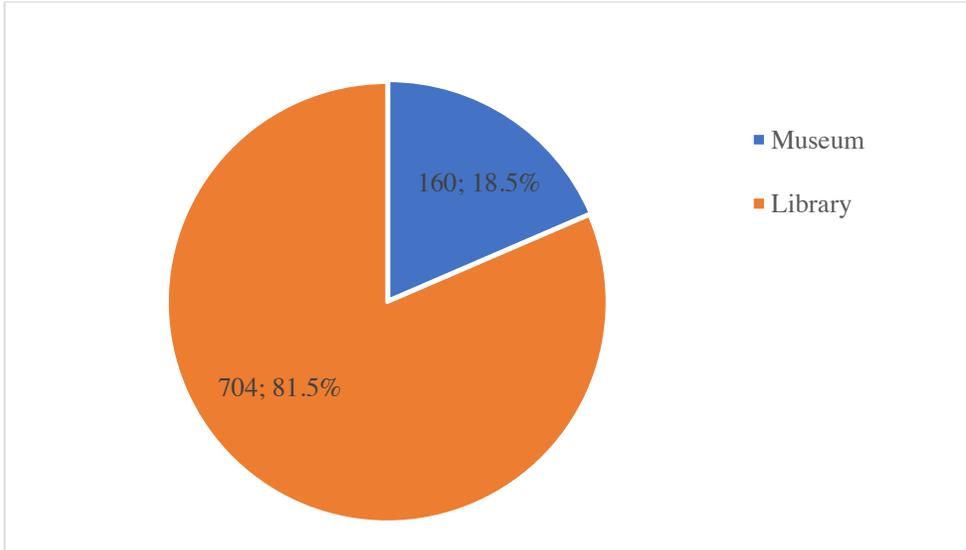


Figure 6.7. Images with Of specific subject headings, institution type and size (864 images)

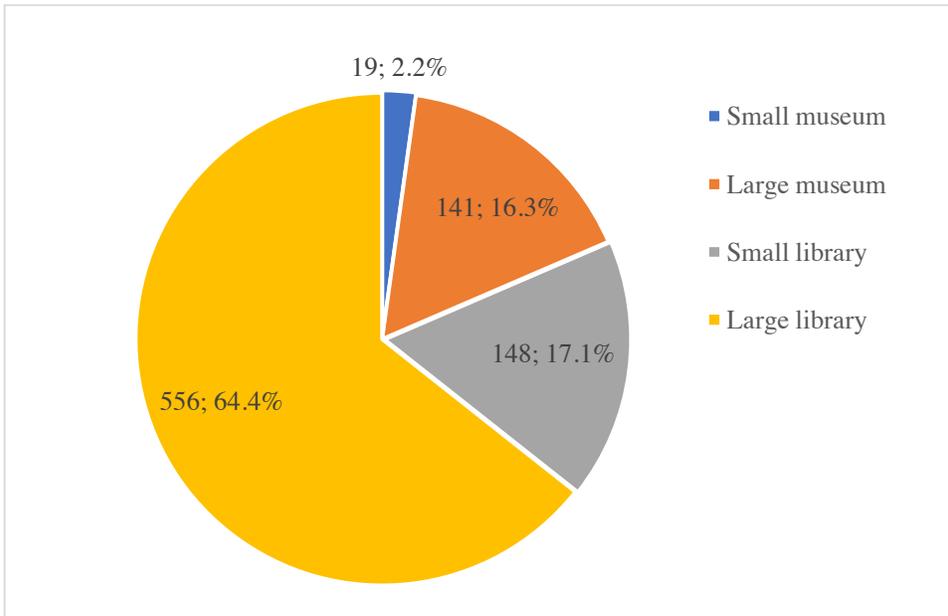


Table 6.3. Of specific terms, museums and libraries

	Museum	Library
Number of images	160/184	704/738
Percent of images	87.0%	95.4%

Table 6.4. Of specific terms, museums and libraries, by size

	Small museum	Large museum	Small library	Large library
Number of images	19/21	141/163	148/153	556/585
Percent of images	90.5%	86.5%	96.7%	95.0%

6.2 Aboutness

The difference between the frequency of *Of* terms and *About* terms is striking, regardless of specificity. Of the 922 images observed, 105 were described using *About* generic subject headings, while only 35 were described using *About* specific (11.4% of occurrences and 3.8% of occurrences, respectively). Again, this discrepancy is supported by the literature, given that *About* terms are difficult to identify given lack of cataloguer subject expertise (Shatford, 1986)

6.2.1 About generic.

About generic terms were used more frequently than *About* specific terms (105 images had *About* generic terms, or 11.4% of occurrences), and the majority of *About* generic terms described library images. However, in order of likelihood to use *About* generic terms, large libraries were most likely, small museums were the next most likely, large museums the third most likely, and small libraries were the least likely. Generally speaking, *About* generic terms included notions such as education or diversity, which were present conceptually in the images but not are figurative representations that can be depicted. It is unclear why generic *About* terms should be used less frequently than their specific counterpart, or why large libraries and small museums should be more likely than large museums or small libraries; there is quite a large margin between the amount of *About* generic terms used by large libraries and any other type of institution. If one can again assume that institution size is directly linked to resources available to devote to the resource-dependent practice of cataloguing images (Jørgensen, 1998; Rossetti, 2013), then this could provide a probable explanation; however, this does not explain why small museums were the next most likely.

Images with no subject headings are not taken into account in the following charts, meaning that the total valid images for this analysis is 922.

Figure 6.8 Images with About generic subject headings, by institution (105 images)

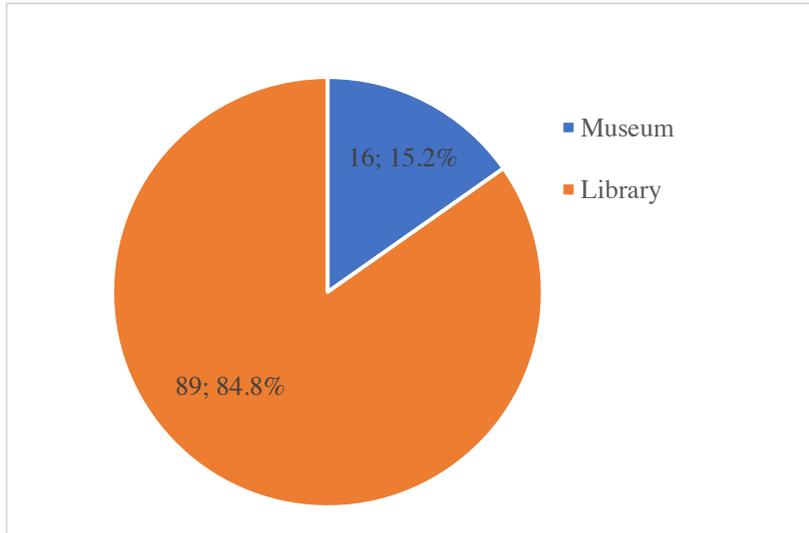


Figure 6.9 Images with About generic subject headings, by institution and size (105 images)

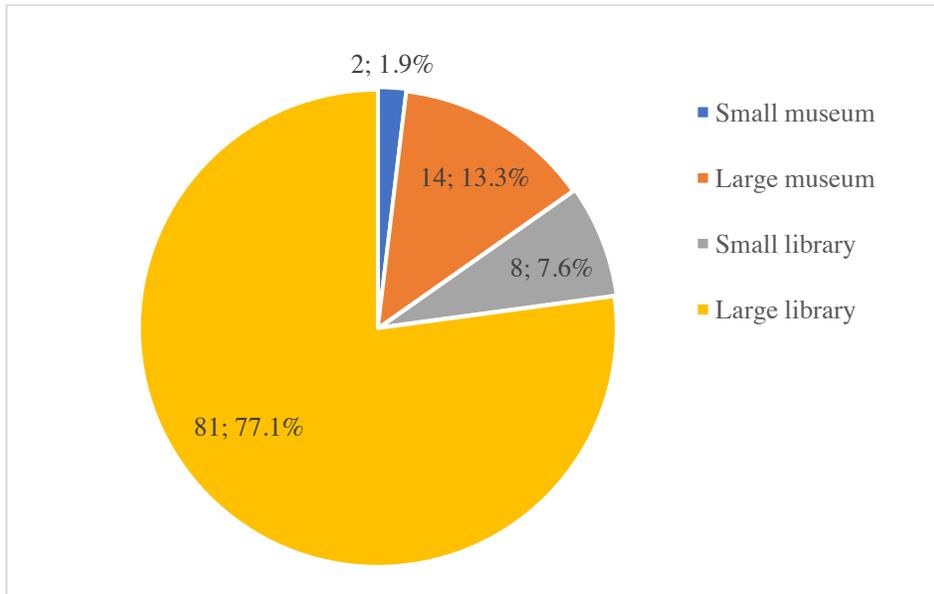


Table 6.5. About generic terms, museums and libraries

	Museum	Library
Number of images	16/184	89/738
Percent of images	8.7%	12.1%

Table 6.6. About generic terms, museums and libraries, by size

	Small museum	Large museum	Small library	Large library
Number of images	2/21	14/163	8/153	81/585
Percent of images	9.5%	8.6%	5.2%	13.8%

6.2.2 About specific.

Out of all types of subject heading terms in the Panofsky/Shatford model, *About* specific terms were used the least, with only 35 images described using *About* specific terms (3.8% of images analyzed). Libraries used *About* specific most frequently, and in fact, the only types of institutions that used *About* specific terms were large libraries and small museums. Again, additional study is required to understand why large libraries and small museums might have this in common.

Images with no subject headings are not taken into account in the following charts, meaning that the total valid images for this analysis is 922.

Figure 6.10. Images with About specific subject headings, by institution type (35 images)

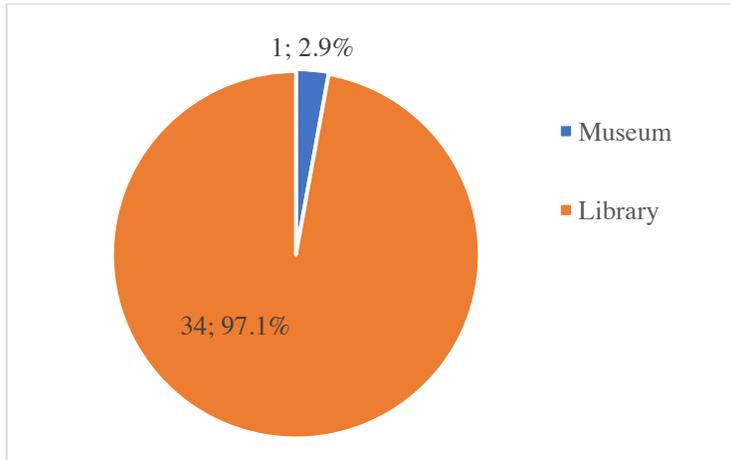


Figure 6.11. Images with About specific subject headings, by institution type and size (35 images)

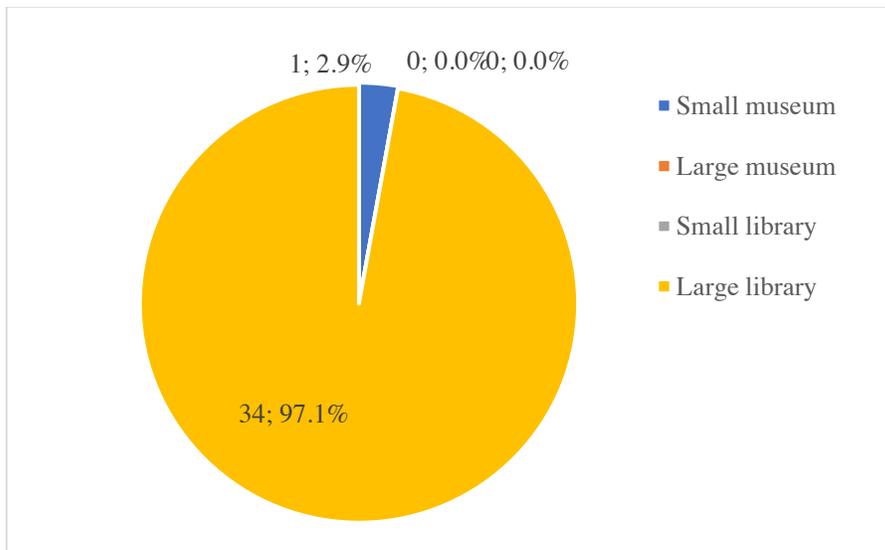


Table 6.7. About specific terms, museums and libraries

	Museum	Library
Number of images	1/184	34/738
Percent of images	0.5%	4.6%

Table 6.8. About specific terms, museums and libraries, by size

	Small museum	Large museum	Small library	Large library
Number of images	1/21	0/163	0/153	34/585
Percent of images	4.8%	0.0%	0.0%	5.8%

6.2.3 Institutions using *Aboutness*.

Given the lack of *About* terms overall, the attributes of the institutions that used them in their cataloguing were analyzed to derive any commonalities or patterns. Cases 02, 03, 04, 05, 06, 09, 10, 13, 15, 16, and 17 used *About* generic terms to describe their images. Cases 02, 05, 06, 09, and 10 used both *About* specific terms and *About* generic terms. There were no cases that used *About* specific and not *About* generic.

Table 6.9. Case studies with About terms

	Institution Type	Collection Size	Number of <i>About</i> generic	Percent of <i>About</i> generic	Number of <i>About</i> specific	Number of <i>About</i> specific
Case 02	Library	Large	16/105	15.2%	2/35	5.7%
Case 03	Library	Large	2/105	1.9%	0/35	0.0%
Case 04	Museum	Large	13/105	12.4%	0/35	0.0%
Case 05	Library	Large	4/105	3.8%	2/35	5.7%
Case 06	Library	Large	29/105	27.6%	9/35	25.7%
Case 09	Library	Large	30/105	28.6%	21/35	60.0%
Case 10	Museum	Small	1/105	1.0%	1/35	2.9%
Case 13	Museum	Large	1/105	1.0%	0/35	0.0%
Case 15	Museum	Small	1/105	1.0%	0/35	0.0%
Case 16	Library	Small	2/105	1.9%	0/35	0.0%
Case 17	Library	Small	6/105	5.7%	0/35	0.0%

The majority of institutions that used *About* generic terms were libraries; out of 11 total cases, seven were libraries while four were museums. Additionally, the majority of the institutions had large collections of Indigenous visual culture, with seven large institutions and four small ones. Out of the 11 cases, large libraries accounted for five occurrences, while small libraries, small museums, and

large museums accounted for two occurrences each. Out of the 105 images observed, large libraries accounted for 81 images described with *About* generic terms (77.1% of total images with *About* generic terms), large museums accounted for 14 images (13.3% of total images with *About* generic terms), small libraries accounted for eight images (7.6% of total images with *About* generic terms), and small museums accounted for two images (1.9% of total images with *About* generic terms).

Additionally, large libraries made up the majority of institutions with both types of *About* terms; four out of the five cases with both types of terms were large libraries, while the remaining case with both types of terms was a small museum. As discussed above in section 6.2.2, 34 out of the 35 images with *About* specific terms belonged to collections in large libraries; additionally, 21 of these 34 images (61.8%) were described by case 09, which also accounted for the case with the highest number of *About* generic terms. Therefore, large libraries are most likely to describe and provide subject access to their Indigenous visual culture collections with *About* terms. As discussed earlier, although a possible explanation for this is budget restrictions of indexing images generally (Jørgensen, 1998; Rossetti, 2013), this does not fully explain the amount of *About* terms in small libraries, small museums, or large museums. If resources were the only consideration and large institutions are assumed have more resources available, the lack of *About* terms in large museums' collection metadata is not explained.

6.3 Appropriateness, Inappropriateness, and Neutrality

As discussed in section 4.2, appropriateness, inappropriateness, and neutrality were coded according to possible combinations of terms that were assessed along an appropriate—neutral—inappropriate spectrum, with “Indians of North America” or other inaccurate or imposed terms being the most frequent cases of inappropriate language, the identification of figurative representations or concepts being considered neutral language, and the use of preferred names of peoples or places the most

common example of appropriate language. Additionally, in section 4.2, the author described the fraught process of determining appropriateness as a possible factor in the dearth of images with appropriate terms—although it is also entirely possible that appropriate terms are not as supported as inappropriate and neutral terms in controlled vocabularies.

Indeed, images with entirely appropriate language numbered only 22, or 2.4% of the 922 images with valid subject headings. Three images had subject terms with some inappropriate and some appropriate language (0.3% of images), and one image has some appropriate and some neutral language (0.1% of images). Therefore, in total 26 images had some kind of appropriate language present (2.8% of images).

Neutral and inappropriate language was by far more common; in fact, the majority of images (521 images, or 56.5%) had a combination of inappropriate and neutral language. There were zero images that had exclusively inappropriate language, though 375 images had only neutral language present in subject headings (40.7% of images). Combining with the one image with appropriate and neutral language with the images with all neutral language, and a combination of inappropriate and neutral terms, 897 images in total have some type of neutral language (97.3% of images). Additionally, combining the 521 images with neutral and inappropriate language with the three images with inappropriate and appropriate terms comes to 524 images with some type of inappropriate language, or 56.8% of images.

This is perhaps due to the reliance of libraries on LCSH, as discovered in the survey results. The work of Berman (1993) demonstrated that the legacy of LCSH as a controlled vocabulary is fraught with biases, and the author noted that many images were coded as having inappropriate language because of the LCSH subject heading “Indians of North America”, as discussed in section 7.2. Additionally, if language classified as neutral indicates language that describes figurative representations, this is

related to the concept of *Ofness*, which was common among images regardless of the metadata's originating institution.

Figure 6.12. Subject heading types, by appropriateness (922 images)

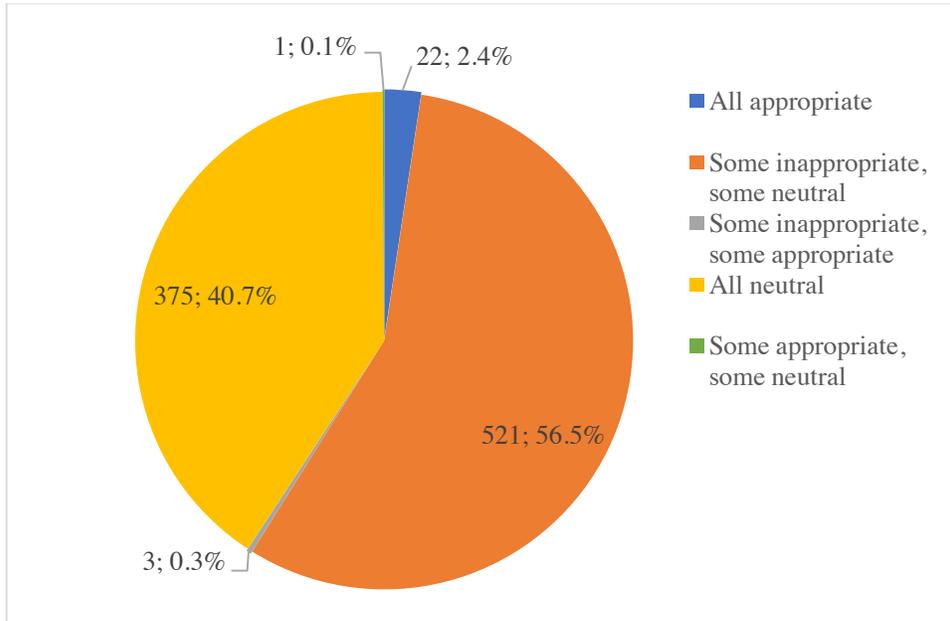
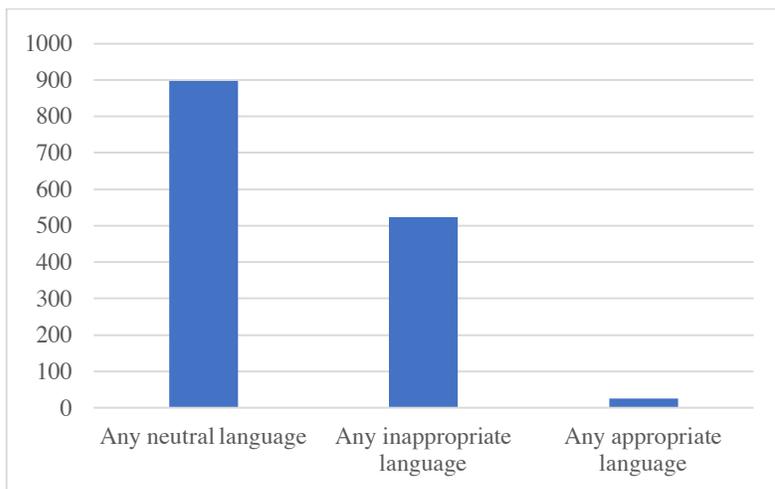


Figure 6.13. Images with neutral, inappropriate, and appropriate language in any combination (922 images)



6.3.1 Appropriateness, inappropriateness, and neutrality, by institution

Of the 22 images with appropriate language, all were in the collections of libraries, with 17 images in the collections of small libraries (77.3% of total images with all appropriate language; 11.1% of images from small libraries), and the remaining five in the collections of large libraries (22.7% of total images with all appropriate language; 0.9% of images from large libraries).

Of the 521 images described with a combination of inappropriate and neutral language, 17 were in the collections of museums (3.3% of total images with neutral and inappropriate language; 9.2% of images from museums), while the remaining 504 were in the collections of libraries (96.7% of total images with neutral and inappropriate language; 68.3% of images from libraries). Small museums were more likely have a combination of neutral and inappropriate language; with 13 images in the collections of small museums (2.5% of total images with neutral and inappropriate language; 61.9% of images from small museums), and the remaining four images in the collections of large museums (0.8% of total images with neutral and inappropriate language; 2.5% of images from large museums).

Among libraries, small libraries accounted for 82 images with neutral and inappropriate language (15.7% of total images with neutral and inappropriate language; 53.6% of images from small libraries), while large libraries had 422 images in their collections with inappropriate and neutral language (81.0% of total images with neutral and inappropriate language; 72.1% of images from large libraries). Therefore, large libraries were the mostly likely to have this combination of inappropriate and neutral language in their image metadata, small museums were the next most likely, small libraries were the third most likely, and large museums were the least likely. It is unclear why small libraries and large museums were less likely to use this combination of language than small museums and large libraries; additional study into the role of institution size and cataloguing practices might provide additional insights.

Figure 6.14. Images with the inappropriate/neutral subject heading combination, by institution type and size (521 images)

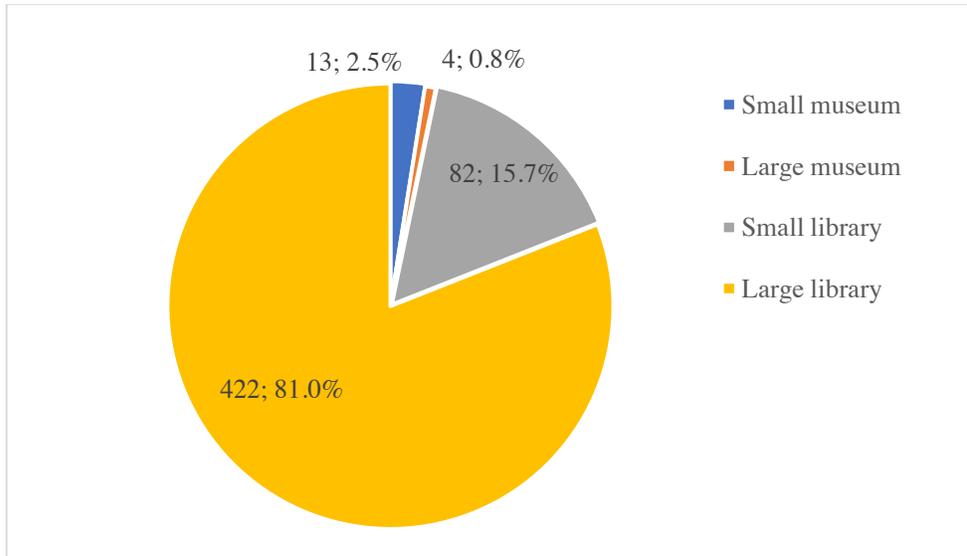


Table 6.10. Inappropriate/neutral terms, museums and libraries

	Museum	Library
Number of images	17/184	504/738
Percent of images	9.2%	68.3%

Table 6.11. Inappropriate/neutral terms, museums and libraries, by size

	Small museum	Large museum	Small library	Large library
Number of images	13/21	4/163	82/153	422/585
Percent of images	61.9%	2.5%	53.6%	72.1%

375 images had all neutral language in their subject terms, 166 of which were in the collections of museums (44.3% of total images with neutral language; 90.2% of images from museums), and the remaining 209 were in the collections of libraries (55.7% of total images with neutral language; 28.3% of images from libraries). Large museums were more likely than small museums to use all neutral language; they accounted for 159 of images with neutral language (42.4% of total images with neutral language; 97.5% of images from large museums), while small museums accounted for seven

images with neutral language (1.9% of total images with neutral language; 33.3% of images from small museums). Among libraries, small libraries had 54 images with neutral language in their collections (14.4% of total images with neutral language; 35.3% of images from small libraries), and large libraries had 155 images described with exclusively neutral language (41.3% of total images with neutral language; 26.5% of images from large libraries). Therefore, large museums were most likely to describe their collections of Indigenous visual culture with only neutral language, small libraries were the next most likely, small museums were the third mostly likely, and large libraries were the least likely. The overall difference between museums and libraries regarding neutral language can likely be ascribed to the relationship between neutral terms and *Ofness*, plus the relationship of *Ofness* to AAT, its focus on item types rather than abstract concepts, and the survey results that indicated AAT's use among museums (Harpring, 2010; Alexander & Meehleib, 2001)

Figure 6.15. Images with neutral subject headings, by institution type and size (375 images)

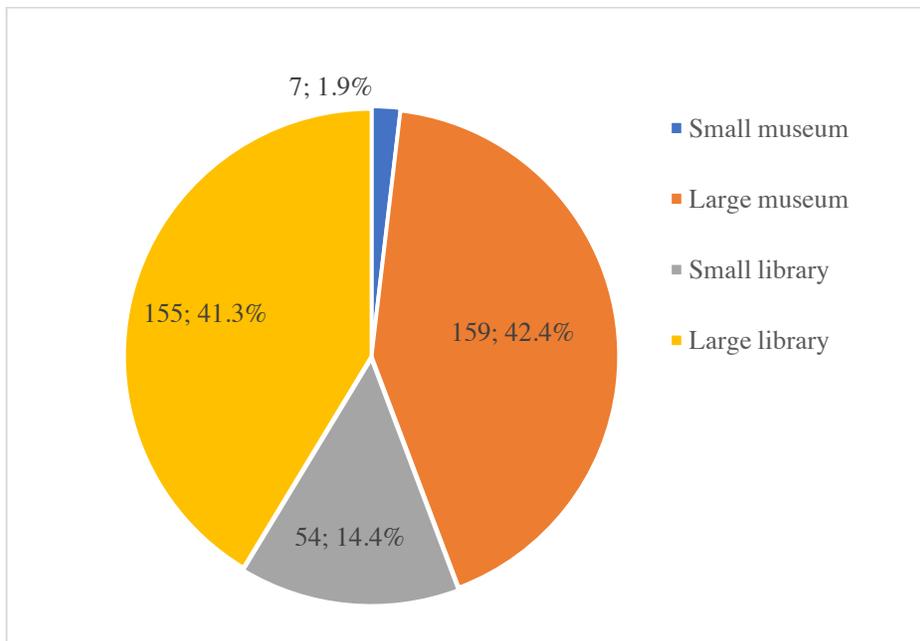


Table 6.12. All neutral terms, museums and libraries

	Museum	Library
Number of images	166/184	209/738
Percent of images	90.2%	28.3%

Table 6.13. All neutral terms, museums and libraries, by size

	Small museum	Large museum	Small library	Large library
Number of images	7/21	159/163	54/153	155/585
Percent of images	33.3%	97.5%	35.3%	26.5%

The combinations of some inappropriate/some appropriate and some appropriate/some neutral were less likely overall. Three images had a combination of inappropriate and appropriate language, all of which were present in the collections of large libraries (0.5% of images from large libraries). The single image with the some appropriate/some neutral combination was in the collection of small museum (4.8% of images from small museums). The cause for these distinctive metadata practices of large libraries and small museums in comparison to the sample as whole requires additional investigation.

6.3.2 Appropriateness and institutional practice.

Given the relative dearth of appropriate language in image subject headings, it may be possible to characterize the types of institutions that use accurate and culturally sensitive language when describing the Indigenous visual culture in their collections. Cases 05 and 20 account for all of the images with all appropriate language; cases 05, 06, and 09 account for the images with a combination of inappropriate and appropriate; and case 12 accounts for the image with a combination of appropriate and neutral language. All of these cases have some type of initiative intended to bring Indigenous voices into the institution.

Table 6.14. Case studies with appropriate language

	Institution Type	Collection Size	No. all appr.	No. inappr./appr.	No. appr./neutral	Types of initiatives
Case 05	Library	Large	5	1	0	Creates educational publications about regional history of Indigenous communities; participates in collaborative collection development; hosts Indigenous scholars-in-residence; supports land and water claims of local Indigenous communities using archival collections
Case 06	Library	Large	0	1	0	Genealogy collection for local Indigenous communities
Case 09	Library	Large	0	1	0	Supports Native American cultural resource center, grant programs for Indigenous students, and university Native Studies program; hosts special events and programming for dialogues with Indigenous creators and teachers
Case 12	Museum	Small	0	0	1	Supports Indigenous scholarly society, participates in repatriation efforts and collaborative collection development, and supports grant programs
Case 20	Library	Large	17	0	0	Supports a local oral history project, including stories from members of regional Indigenous communities

In this case, while large libraries may be likely to use inappropriate and neutral language, clearly this is not indicative of all large libraries, as the majority of cases with appropriate language are found in large libraries. Cases 06, 09, and 20 had responses from survey participants about their own knowledge and their institution’s treatment of Indigenous visual culture, which may also shed light on

the ways expertise and cataloguing practices influence subject metadata. The cataloguers surveyed ranked their own knowledge thusly:

Table 6.15. Cataloguer knowledge survey results for case studies with appropriate terms

How knowledgeable are you on the following topics?	Case 6	Case 09	Case 20
4a. Indigenous cultures and traditional knowledge	Slightly familiar	Knowledgeable	Knowledgeable
4b. Decolonization efforts of information organizations	Not familiar	Knowledgeable	Knowledgeable
4c. Collaborative projects with Indigenous communities	Not familiar	Slightly familiar	Knowledgeable
4d. Colonial biases in controlled vocabularies such as LCSH	Knowledgeable	Knowledgeable	Knowledgeable

The results from case 20 shows consistency with appropriate language usage and cataloguer knowledge regarding Indigenous cultures, biases in information organizations, and outreach efforts with Indigenous communities. The three respondents offered the following information about their respective institutions:

Table 6.16. Institutional practices survey results for case studies with appropriate terms

Please rate the following statements regarding your institution.	Case 06	Case 09	Case 20
5a. My institution participates in decolonization initiatives.	Strongly disagree	Neutral	Disagree
5b. My institution works with local Indigenous communities in order to derive appropriate descriptive terminology and cataloguing policies.	Strongly disagree	Agree	Strongly disagree
5c. My institution trains all employees in cultural biases and promotes sensitive and accurate language use.	Strongly disagree	Neutral	Agree

Please rate the following statements regarding your institution.	Case 06	Case 09	Case 20
5d. My institution's participation in decolonization initiatives is affected by budgetary constraints.	Don't know	Neutral	Agree

The responses from case 06 are consistent in terms of the cataloguer's slight familiarity with Indigenous cultures and outreach activities and their institution's lack of involvement with local Indigenous communities. Although case 06 boasts a genealogical collection intended to give Indigenous communities information about their history and familial ties, this is not accompanied by outreach efforts or engagement with those communities.

Cases 09 and 20 offer slightly stronger correlations between outreach and appropriate language usage; for case 09 this is demonstrated through collaborative work with Indigenous communities to derive terms and descriptive practices, while for case 20 this is demonstrated through staff training and the promotion of language that is accurate and culturally sensitive. The respondent from case 20 also indicated that budgetary constraints are an impediment to additional collaborative and inclusionary work with Indigenous communities.

Finally, the respondents rated their institutions' image cataloguing handbooks thusly (cases 06 and 09 did not indicate that their institutions have any such document):

Table 6.17. Cataloguing guidelines survey results for case studies with appropriate terms

Please rate the following statements regarding your institution's training materials.	Case 06	Case 09	Case 20
12c. Guidelines provide additional instructions for describing culturally sensitive images.	Missing (no handbook or guide)	Missing (no handbook or guide)	Disagree

Please rate the following statements regarding your institution's training materials.	Case 06	Case 09	Case 20
12d. My institution's policies for describing images enable culturally appropriate and accurate use of language.	Missing (no handbook or guide)	Missing (no handbook or guide)	Disagree
12e. Guidelines include additional information for describing material culture or images from non-Western cultures.	Missing (no handbook or guide)	Missing (no handbook or guide)	Strongly disagree

This lack of data from cases 06 and 09 is perhaps as important as the data points that the respondent from case 20 provides, as it indicates that the practice of describing images resides entirely in the expertise of the cataloguer and their familiarity not only with image description models such as Shatford's, but also with their knowledge of Indigenous visual culture, and perhaps from observation of catalogue records prepared by others. The responses from the participant from case 20 indicate that while their catalogue practices are indeed based in their own expertise and perhaps influenced their institution's emphasis on appropriate language use, this is not documented officially.

The data and survey responses from the cases that used appropriate language demonstrated a great deal of variety in cataloguer expertise and institutional practices. And given that 12 out of 20 cases had some type of institutional activity meant to bring Indigenous perspectives into the institutional context while only five of those had appropriate language, it may be fruitful to more closely examine the remaining seven cases with a focus on neutral language, rather than appropriate language.

Additionally, case 13 will be included in this sample because although the beginning stages of website content analysis did not reveal any institutional initiatives, the participant from case 13 answered in the affirmative to the question about their institution's decolonization efforts.

Table 6.18. Case studies with neutral language

	Institution Type	Collection Size	No. all neutral	No. inappr./neutral	No. appr./neutral	Types of initiatives
Case 03	Library	Large	5	128	0	Participates in repatriation efforts
Case 04	Museum	Large	20	0	0	Participates in repatriation efforts
Case 10	Museum	Small	1	13	0	Participates in repatriation efforts; hosts Indigenous artists-in-residence
Case 13	Museum	Large	137	4	0	Missing (survey results)
Case 14	Museum	Small	0	0	0	Creates lesson plans for educators regarding Indigenous visual culture, hosts events and programming for Indigenous creators
Case 16	Library	Small	4	21	0	Participates in collaborative collection building
Case 18	Museum	Large	2	0	0	Participates in repatriation efforts and collaborative collection building; supports grant funding and Indigenous oral history project
Case 19	Library	Small	1	38	0	Supports an Indigenous research center

Among these cases, it can be noted that there are far more museums included, given increased likelihood of museums to have neutral terms in their image subject metadata overall (see sections 6.4.1 and 6.7). Also important to note is that the number of images with inappropriate/neutral terms are nearly as many as the images with exclusively neutral terms, even among these cases.

To contextualize some of this data, cases 03, 10, 13, 14, 16, and 18 had responses from cataloguing staff. They rated their own knowledge regarding Indigenous cultures and outreach initiatives thusly:

Table 6.19. Cataloguer knowledge survey results for case studies with neutral language

How knowledgeable are you on the following topics?	Case 03	Case 10 (1)	Case 10 (2)	Case 13	Case 14	Case 16	Case 18
4a. Indigenous cultures and traditional knowledge	Not familiar	Slightly familiar	Not familiar	Slightly familiar	Knowledgeable	Slightly familiar	Knowledgeable
4b. Decolonization efforts of information organizations	Not familiar	Slightly familiar	Neutral	Knowledgeable	Neutral	Slightly familiar	Knowledgeable
4c. Collaborative projects with Indigenous communities	Not familiar	Knowledgeable	Neutral	Knowledgeable	Neutral	Slightly familiar	Knowledgeable
4d. Colonial biases in controlled vocabularies such as LCSH	Not familiar	Not familiar	Neutral	Knowledgeable	Neutral	Knowledgeable	Slightly familiar

As discussed in section 5.10, the responses from the participants from case 10 help to reveal the inconsistency that can exist at a single institution and the types of expertise that may exist among individuals or between different units in an organization. Perhaps unsurprisingly, most of the respondents with knowledge of collaborative projects with Indigenous communities work at institutions that engage in that kind of outreach (cases 16 and 18). Overall, the respondent from case 18 expressed the most knowledge about the statements, and they also remarked in another section of the survey that their institution works with Indigenous communities to derive self-determined cultural names. The respondents answered thusly to the statements regarding their institution’s practices:

Table 6.20. Institutional practices survey results for case studies with neutral language

Please rate the following statements regarding your institution.	Case 03	Case 10 (1)	Case 10 (2)	Case 13	Case 14	Case 16	Case 18
5a. My institution participates in decolonization initiatives.	Don't know	Strongly agree	Strongly agree	Agree	Neutral	Disagree	Strongly agree
5b. My institution works with local Indigenous communities in order to derive appropriate descriptive terminology and cataloguing policies.	Don't know	Neutral	Strongly agree	Agree	Neutral	Disagree	Strongly agree
5c. My institution trains all employees in cultural biases and promotes sensitive and accurate language use.	Disagree	Strongly disagree	Agree	Agree	Agree	Disagree	Strongly agree
5d. My institution's participation in decolonization initiatives is affected by budgetary constraints.	Don't know	Agree	Neutral	Don't know	Neutral	Disagree	Agree

While both respondents from case 10 agreed on statement 5a, they did not agree on whether their institution provides staff training regarding appropriate language use. It is also important to note that case 03, which had the most inappropriate/neutral subject terms of all five cases also had responses

that demonstrated the least amount of cataloguer knowledge regarding Indigenous culture and outreach initiatives, as well as the uncertainty regarding institutional efforts to engage with Indigenous communities. The responses from case 13 were consistent between the cataloguer’s knowledge and the activities of their institution, and although case 18’s responses also seem to be consistent with their knowledge of Indigenous cultures and outreach efforts, like the participant from case 20, they also expressed that their institution’s participation in decolonizing projects are effected by their budget. Finally, the participant from case 16 indicated that while their institution does not participate in decolonization initiatives, this is not effected by their budget.

Regarding their institutions’ handbooks and cataloguing guides, the respondents answered thusly:

Table 6.21. Cataloguing guidelines survey results for case studies with neutral language

Please rate the following statements regarding your institution’s training materials.	Case 03	Case 10 (1)	Case 10 (2)	Case 13	Case 14	Case 16	Case 18
12c. Guidelines provide additional instructions for describing culturally sensitive images.	Neutral	Strongly disagree	Neutral	Agree	Neutral	Disagree	Neutral
12d. My institution’s policies for describing images enable culturally appropriate and accurate use of language.	Neutral	Disagree	Strongly agree	Neutral	Neutral	Disagree	Strongly agree
12e. Guidelines include additional	Neutral	Neutral	Disagree	Agree	Neutral	Disagree	Strongly agree

Please rate the following statements regarding your institution's training materials.	Case 03	Case 10 (1)	Case 10 (2)	Case 13	Case 14	Case 16	Case 18
information for describing material culture or images from non-Western cultures.							

Something that is consistent across most cases in this sample and in all of the survey responses is the lack of documentation regarding cataloguing practices for Indigenous or non-Western visual culture. While most respondents answered neutrally or disagreed with statements regarding guidelines that provide additional information about culturally sensitive or non-Western images, or about using accurate and appropriate language, only cases 13, 16, and 20 answered in the affirmative to any of the three statements above.

This variety or lack of a clear pattern was, in a sense, the most notable pattern to be found regarding institutional practices for cataloguing; while it was clear that most respondents indicated that their institutions did not provide written instructions for describing Indigenous visual culture, it was equally clear that all of the respondents showed a range of familiarity with Indigenous cultures; their institutions demonstrated varying types of engagement with Indigenous communities; and the images in their online collections provided subject access that showed varying degrees of appropriateness, inappropriateness, and neutrality. Overall, the institutions that showed a correlation between cataloguer expertise, institutional engagement with Indigenous communities, and effective language use were cases 13, 18, and 20, which are two large museums and a small library, respectively.

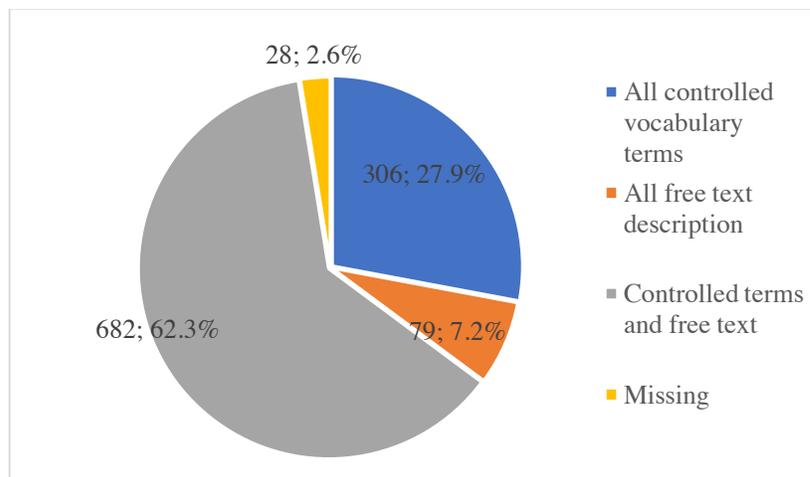
6.4 Subject Matter Description: Controlled Vocabularies, Free Text Description and Folksonomies

6.4.1 Controlled vocabularies and free text description.

The above analysis is primarily focused on the 922 images with subject headings; however, that leaves 173 images remaining, including four cases excluded entirely from analysis, plus portions of another five cases. When coding for controlled vocabularies and free text, the metadata for all 1095 images was taken into consideration, given the preponderance of free text description alongside or in lieu of subject headings, as well as the use of controlled vocabulary terms in fields that described image subject matter without being explicitly referred to as “Subject”.

Despite this, 28 images had neither free text description or subject heading access of any kind (2.6% of total). However, 79 images were described using free text entirely (7.2% of total), while another 306 were described using only controlled vocabulary terms (27.9% of total). Most common, however, were images with a combination of controlled terms and free text, totaling 682 images, or 62.3% of images. When combined, 988 images had some form of controlled vocabulary used to describe their subject matter, accounting for 90.2% of all images.

Figure 6.16. Controlled vocabularies and free text description (1095 images)



6.4.2 Controlled vocabularies and free text description, by institution.

Of the 28 images missing subject matter description, all were in the collections of museums and accounted for 8% of the images in museum collections. 19 of these images were in small museum collections (67.9% of total images missing subject matter description; 32.2% of images from small museums), while the remaining nine images were in the collections of large museums (32.1% of total images missing subject matter description; 3.1% of images from large museums). This is supported by the literature, which highlighted the importance of administrative functions rather than description or retrieval for museum record keeping (Trant, 2006).

Additionally, museums accounted for the majority of images described with only controlled vocabulary terms; 186 images from museums had only controlled terms (60.8% of total images with only controlled vocabulary terms; 53.4% of all images from museums), while libraries accounted for 120 images with controlled vocabulary subject matter description (39.2% of total images with only controlled vocabulary terms; 16.1% of images from libraries). Among museums, large museums were much more likely to use controlled terms exclusively, accounting for 169 images (55.2% of total images with only controlled vocabulary terms; 58.5% of images from large museums), while small museums had 17 images described exclusively with controlled terms (5.6% of total images with only controlled vocabulary terms; 28.8% of images from small museums). 42 images in the collections of small libraries were described using only controlled vocabulary terms (13.7% of total images with only controlled vocabulary terms; 25.9% of images from small libraries), while 78 such images were in the collections of large libraries (25.5% of total images with only controlled vocabulary terms; 13.3% of images from large libraries). Therefore, large museums were most likely to only use controlled vocabulary to describe Indigenous visual culture subject matter, small museums were the next most likely, small libraries were the third most likely, and large libraries were the least likely. It is unclear why museums were more likely to use controlled vocabularies exclusively than libraries, or what role size may play as well. A possible explanation is the author's observation that museums

described image subject matter in fields other than traditional subject fields, and that those may be related to specific controlled vocabularies. Additional study could explain this link between metadata schema, subject matter description, and use of controlled vocabularies.

Figure 6.17. Images with only controlled vocabulary subject matter description, by institution type and size (306 images)

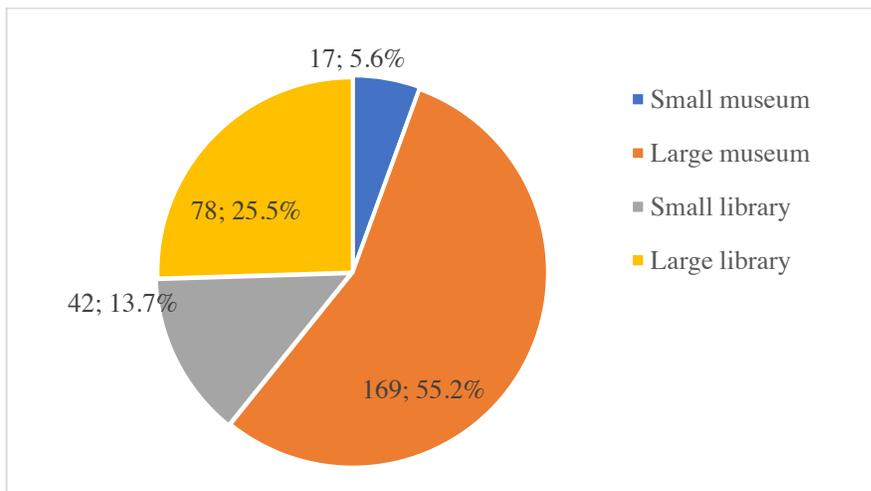


Table 6.22. All controlled vocabulary terms, museums and libraries

	Museum	Library
Number of images	186/348	120/747
Percent of images	53.4%	16.1%

Table 6.23. All controlled vocabulary terms, museums and libraries, by size

	Small museum	Large museum	Small library	Large library
Number of images	17/59	169/289	42/162	78/585
Percent of images	28.8%	58.5%	25.9%	13.3%

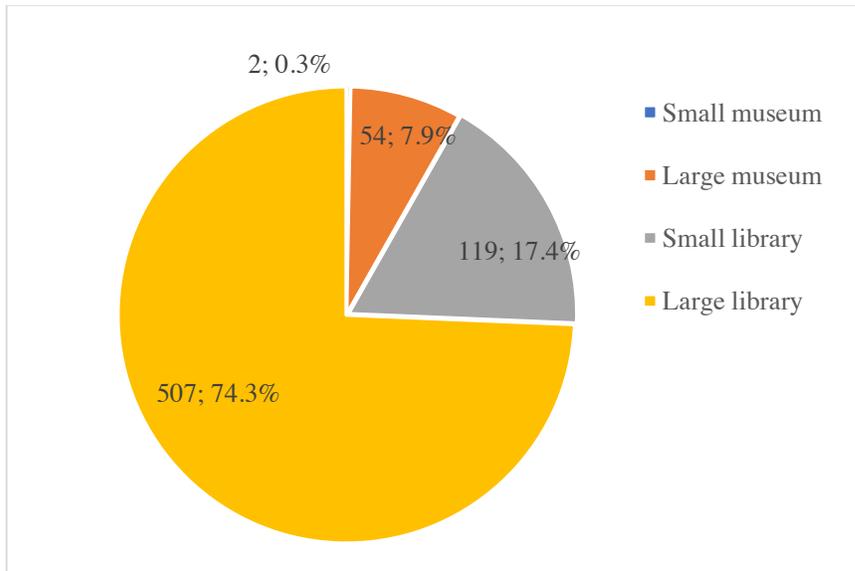
Of the 79 images described using only free text, the vast majority were found in museums, accounting for 78 images (98.7% of total images with only free text description; 22.4% of images from museums), with the single remaining image found in library collections (1.3% of total images with

only free text description; 0.1% of images from libraries). This single library image was found in the collection of a small library, accounting for 1.3% of the total images with only free text description and 0.6% of images from small libraries. Among museums, use of exclusively free text description occurred most frequently in large museums; 57 images from large museums were described as such (72.2% of total images with only free text description; 19.7% of images from large museums), while 21 images with free text description solely were found in the collections of small museums (26.6% of total images with only free text description; 35.6% of images from small museums). Although small museums accounted for a smaller frequency of the images described using only free text description, they are more likely to be found among the images from small museums than large museums. Again, the reason for this likelihood for free text description without controlled vocabularies among museums is unclear; given that museums were also more likely to use controlled vocabularies exclusively than libraries, and libraries overwhelmingly described images with controlled vocabularies and free text combined, this shows a greater variety of image description methods and less data standardization in museums compared to libraries. This most likely is due to the unique nature of museum collections, and the creation of library metadata as a collaborative, resource-sharing process among institutions (Allen & Bishoff, 2002).

Indeed, although the controlled vocabulary/free text combination was most frequently found in the image population overall at 682 occurrences (62.3% of all images), they were most frequently found in library collections; at 626 images (91.8% of total images with controlled vocabulary terms and free text description; 83.8% of images from libraries), they far outnumbered the 56 images described with controlled terms and free text in museum collections (8.2% of total images with controlled vocabulary terms and free text description; 16.1% of images from museums). Among these 56 images, two images were in the collections of small museums (0.3% of total images with controlled vocabulary terms and free text description; 3.4% of images from small museums), while the remaining 54 were in the collections of large museums (7.9% of total images with controlled vocabulary terms and free text

description; 18.7% of images from large museums). Among libraries, 119 images with controlled terms/free text combined were found in small libraries (17.4% of total images with controlled vocabulary terms and free text description; 73.5% of images from small libraries), while large libraries accounted for 507 images with subject matter described as such (74.3% of total images with controlled vocabulary terms and free text description; 86.7% of images from large libraries). Considering that library cataloguing practices outside of image description have been developed to enable interoperability and collaboration given their mostly non-unique collections, as described by Allen and Bishoff (2002), it is unsurprising that the same principles be applied to image cataloguing, thus explaining the high degree of data standardization in comparison to museums.

Figure 6.18. Images with a combination controlled vocabulary/free text description subject matter description (682 images)



6.4.3 Controlled vocabularies.

Given the preponderance of images with subject matter described using controlled vocabularies, survey respondents were asked which vocabularies their institutions use. In total, there were ten sets

of responses from nine institutions (see section 5.10 and both sets of responses). Out of these responses, AAT was the most commonly identified controlled vocabulary used. Respondents from eight different institutions indicated their use of AAT, or 88.9% of respondents that provided data about their controlled vocabulary usage. The majority of these institutions were museums (five out of eight, or 62.5%). Museums were also more likely to have generic terms of any type, while libraries described image subjects with more *Of* specific than *Of* generic, and more *About* generic than *About* specific. As Harpring (2010) discussed, AAT tends to provide terms that are generic rather than identifying specific peoples or places. While this is not necessarily conclusive evidence, the correlation may indicate that the preponderance of museum images with generic description is due to the prevailing use of AAT in museums. Additionally, the observed amount of physical description and terms used to name media or techniques for ethnographic objects may also be due to use of AAT in museums, which is also a central focus of AAT's construction (Harpring, 2010).

The next most common controlled vocabulary was LCSH with six respondents from different institutions reporting their usage (66.7% of institutions with survey results). Perhaps unsurprisingly, the majority of institutions using LCSH were libraries (four out of six reported, or 66.7% of institutions using LCSH). The next most commonly used were LCTGM, which was used exclusively by libraries (three institutions, or 33.3% of institutions), and Nomenclature, which was used exclusively by museums (two institutions, or 22.2% of institutions). Case 10, which was one of the reported users of Nomenclature, showed another inconsistency between its two respondents; while one reported using Nomenclature, the other reported using LCSH and AAT. A possible explanation for this inconsistency is that both respondents work in different units and from different rationales; one from a collections rationale, the other from a curatorial one.

Among the "Other" controlled vocabularies listed were Iconclass, "Bilingual Index" (which may be referring to Bilindex), "Queens Library Subject Headings" (most likely Queens Library Spanish

language subject headings), Getty Geographical Thesaurus for place names, and self-determined cultural names. Eight out the nine institutions (88.9% of institutions) that responded indicated that they also use locally-derived terminology for indexing.

6.4.4 Folksonomies.

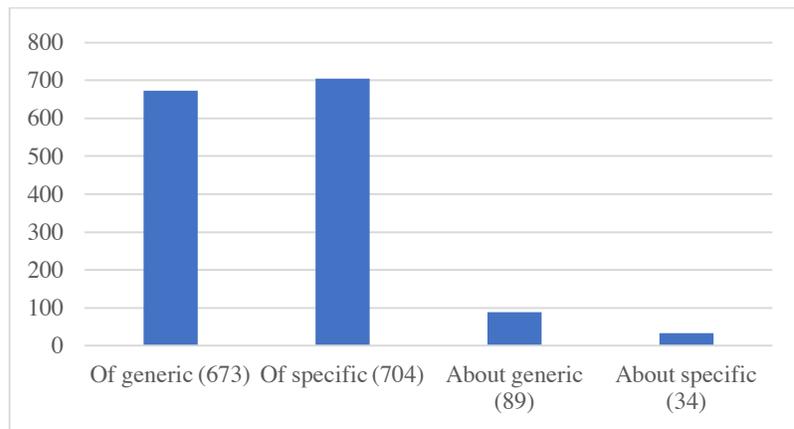
To determine the usage of folksonomies, survey results and website content analysis can be considered. Social tagging was found in the online collections of five institutions, all of them libraries (three were small libraries, and two were large libraries): cases 02, 03, 16, 17, and 20. While it was not officially gathered as data, it was observed that all of the institutions with social tagging in their online collections were hosted in what appeared to be CONTENTdm's platform, and thus had the social tagging and commenting functionalities enabled.

The survey results were not entirely consistent with the content analysis. The respondents that reported use of social tagging were cases 03, 10, 14, and 17. Cases 03 and 17 were consistent, while case 02 had no survey responses for comparison. The respondents from cases 16 and 20 may have been unaware of this functionality in CONTENTdm, and cases 14 and 17 may have social tagging enabled on another platform than their online collections, such as Flickr Commons. Indeed, social tagging appears so variable and inconsistent in the results that it may be necessary to use a platform such as Flickr Commons to observe tagging and folksonomy usage; as Kalfatovic, Kapsalis, Spiess, Van Camp, and Edson (2008) pointed out, activity and a large number of users on Flickr Commons does not necessarily translate into increased institutional website traffic. Overall, the data regarding folksonomies may demonstrate some lack of usage, though the lack of detailed observation is generally inconclusive.

6.6 Characteristics of Libraries

With much of the survey and content analysis data presented, it may now be fruitful to gather it in order to distinguish some of defining characteristics of the institutions observed. Although images from libraries were more highly represented in the sample overall, a larger ratio of library images are also represented among those with valid subject headings. Of the 747 images surveyed, 738 had valid subject headings, representing 98.8% of all library images surveyed, 67.4% of all images surveyed, or 80.0% of all images surveyed with valid subject headings. Out of these 738 images, 704 were described using *Of* specific terms (95.4% of occurrences), 673 were described using *Of* generic terms (91.2% of occurrences), 89 were described using *About* Generic terms (12.1% of occurrences), and 34 images were described using *About* specific terms (4.6% of occurrences). While library images account for the majority of occurrences in all four of these categories, the margin of usage between libraries and museums of *About* specific terms is particularly high, as 34 of the occurrences out of a total of 35 occur in library collections. Conclusive reasoning for this is not present in the literature, although perhaps increased usage of LCTGM among libraries explains this in part, due to its emphasis on abstract concepts in comparison to AAT (Alexander & Meehleib, 2001; Harpring, 2010).

Figure 6.19. Images from libraries, by subject heading type (738 images)



The vast majority of library images were described using a combination of inappropriate/neutral language (504 out of 738 valid images, 68.3% of library images), followed by entirely neutral language (209 images, 28.3% of library images), then by entirely appropriate language (22 images, 3.0% of library images), and finally by a combination of appropriate and inappropriate language (three images, 0.4% of library images). There were zero images described with a combination of appropriate and neutral terms. Comparatively, libraries were much more likely than museums to use the inappropriate/neutral combination of language, likely due to the adherence to LCSH for terminology to describe Indigenous subjects, as will be discussed in chapter seven.

Finally, libraries are notable for having some kind of metadata field describing image subject matter, although nine images did not have “Subject” fields as such. Most common was the use of a combination of free text description and controlled vocabulary terms (626 out of the total 747 images surveyed, 83.8% of all library images), followed by exclusively controlled vocabulary terms (120 images, 16.1% of all library images), and finally by exclusively free text description (one image, 0.1% of all library images). Comparatively, libraries were much likelier to use the combination of free text description and controlled vocabulary terms than museums. While the reason for this is unclear, it may be due to cataloguing practices in libraries which stress interoperability and collaboration because of libraries’ largely non-unique collections (Allen & Bishoff, 2002).

From the survey responses, there were an equal number of libraries and museums, in addition to equal numbers of small and large institutions; three small libraries, three large libraries, three small museums (two respondents from one small museum), and three large museums. On average, library cataloguing teams tended to be slightly larger (5.3 people per institution in comparison to 4.5 people per institution, respectively), and out of the three respondents that reported that their institutions had no cataloguing handbook, two were from libraries, while social tagging was distributed evenly between libraries and museums. As discussed in section 6.5.2, Library of Congress controlled

vocabularies were more prevalent in libraries than museums. 66.7% of the respondents that reported using LCSH were in libraries, while 100.0% of the users that reported using LCTGM were from libraries. Because there were four libraries that provided information about controlled vocabulary usage, that means 100.0% of libraries use LCSH, and 75.0% use LCTGM. Additionally, 75.0% of libraries use AAT, although this accounts for 37.5% of the institutions that reported using AAT.

Library respondents answered thusly about their knowledge, their institution’s outreach efforts, and guidelines:

Table 6.24. Cataloguer knowledge survey results, libraries

How knowledgeable are you on the following topics?	Case 03	Case 06	Case 09	Case 16	Case 17	Case 20
4a. Indigenous cultures and traditional knowledge	Not familiar	Slightly familiar	Knowledgeable	Slightly familiar	Neutral	Knowledgeable
4b. Decolonization efforts of information organizations	Not familiar	Not familiar	Knowledgeable	Slightly familiar	Neutral	Knowledgeable
4c. Collaborative projects with Indigenous communities	Not familiar	Not familiar	Slightly familiar	Slightly familiar	Neutral	Knowledgeable
4d. Colonial biases in controlled vocabularies such as LCSH	Not familiar	Knowledgeable	Knowledgeable	Knowledgeable	Slightly familiar	Knowledgeable

Table 6.25. Institutional practices survey results, libraries

Please rate the following statements regarding your institution.	Case 03	Case 06	Case 09	Case 16	Case 17	Case 20
5a. My institution participates in decolonization initiatives.	Don't know	Strongly disagree	Neutral	Disagree	Strongly disagree	Disagree
5b. My institution works with local Indigenous communities in order to derive appropriate descriptive terminology and cataloguing policies.	Don't know	Strongly disagree	Agree	Disagree	Strongly disagree	Strongly disagree
5c. My institution trains all employees in cultural biases and promotes sensitive and accurate language use.	Disagree	Strongly disagree	Neutral	Disagree	Strongly disagree	Agree
5d. My institution's participation in decolonization initiatives is affected by budgetary constraints.	Don't know	Don't know	Neutral	Disagree	Strongly disagree	Agree

Table 6.26. Cataloguing guidelines survey results, libraries

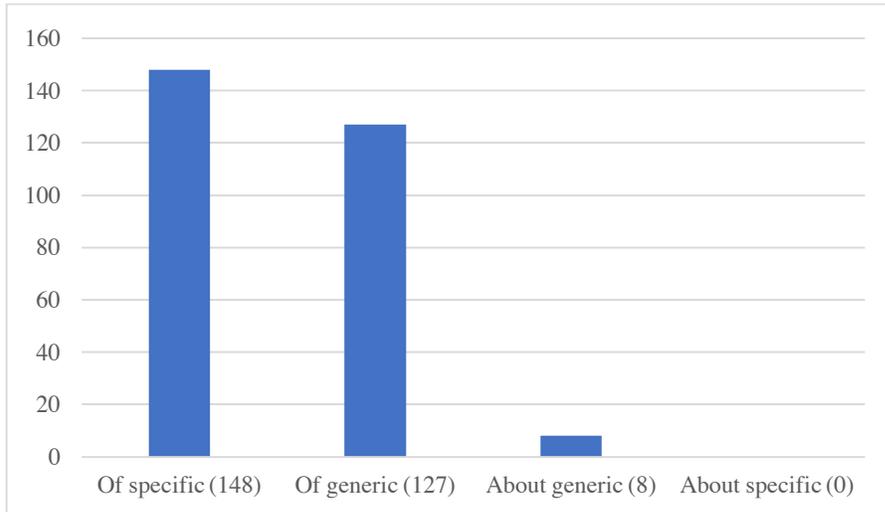
Please rate the following statements regarding your institution's training materials.	Case 03	Case 06	Case 09	Case 16	Case 17	Case 20
12a. Instructions are clearly laid out and understandable.	Neutral	Missing (no handbook or guide)	Missing (no handbook or guide)	Agree	Agree	Neutral
12b. There are sufficient guidelines for describing specific types of images.	Neutral	Missing (no handbook or guide)	Missing (no handbook or guide)	Agree	Agree	Agree
12c. Guidelines provide additional instructions for describing culturally sensitive images.	Neutral	Missing (no handbook or guide)	Missing (no handbook or guide)	Disagree	Neutral	Disagree
12d. My institution's policies for describing images enable culturally appropriate and accurate use of language.	Neutral	Missing (no handbook or guide)	Missing (no handbook or guide)	Disagree	Neutral	Disagree
12e. Guidelines include additional information for describing material culture or images from non-Western cultures.	Neutral	Missing (no handbook or guide)	Missing (no handbook or guide)	Disagree	Neutral	Strongly disagree

two out of four respondents expressed that handbook instructions were clear, while the remaining were neutral; additionally, two out of four library respondents reported that cataloguing handbooks provided information about describing specific types of images, while one was neutral, and one disagreed with this statement. The statements regarding handbook instructions for culturally sensitive images, appropriate language, and non-Western visual culture were answered neutrally, with disagreement, or strong disagreement. While many of these responses vary by institution, generally in comparison to museums, library cataloguing staff show more knowledge about LCSH biases, but less about Indigenous culture and demonstrate less institutional activities engaging with Indigenous communities. Knowledge about LCSH biases is likely due increased prevalence of the controlled vocabulary in libraries; however, to understand why library professionals and libraries in general engaged less with Indigenous communities than their museums counterparts, more study is required.

6.6.1 Characteristics of small libraries.

162 of the images surveyed were in the collections of small libraries, and 153 of those had valid subject headings; this means that all nine images without valid subject headings were in the collections of small libraries. These 153 images constitute 20.7% of all library images with valid subject headings and 16.6% of all images with valid subject headings overall. Out of these 153 images, 148 were described using *Of* specific terms (96.7% of occurrences), 127 were described using *Of* generic terms (83.0% of occurrences), Eight were described using *About* generic terms (5.2% of occurrences), and zero images were described using *About* specific terms. In general, small libraries followed the overall library trend of primarily using *Of* specific terms most frequently and *About* generic terms more frequently than *About* specific.

Figure 6.20. Images from small libraries, by subject heading type (153 images)



Small libraries also followed the overall library trend of having the inappropriate/neutral combination used to describe images most frequently (82 out of 153 images with valid subject headings, 53.6% of small library images), followed by all neutral terms (54 images, 35.3% of small library images), and then by exclusively appropriate terms (17 images, 11.1% of small library images). There were zero images with a combination of appropriate/neutral terms or appropriate/inappropriate. Among libraries, small libraries accounted for the majority of images described using only appropriate language; indeed, given that images with only appropriate terms were found exclusively in libraries, small libraries surpassed all other types and sizes of institutions in this study. Further study is required to ascertain why small libraries were so much more likely compared to other types and sizes of institutions to use appropriate language.

The vast majority of small libraries described images with a combination of free text and controlled vocabulary terms (119 out of 162 total images observed, 73.4% of total images from small libraries), while the use of exclusively controlled vocabulary terms was the second most common (42 images, 25.9% of total images from small libraries), and the use of exclusively free text description was the

least common (one image, 0.6% of images from small libraries). Although there were nine images lacking valid subject fields, there were zero images that lacked subject matter description in other metadata fields.

In comparison to large libraries, small library cataloguing teams did not differ in size from large libraries; nor did the commonality of social tagging, with one institution from each group with social tagging enabled. All of the respondents from small libraries indicated that their institutions have image cataloguing guidelines, differing surprisingly from large libraries, of which two out of three were without handbooks. All three small libraries used LCSH and AAT, accounting for 50.0% of institutions that reported using LCSH and 75.0% of libraries using LSCH, as well as accounting for 37.5% of institutions using AAT and 100.0% of libraries using AAT. Two out of three small libraries also reported using LCTGM, accounting for 66.7% of libraries using LCTGM. Small library respondents answered thusly about their knowledge, their institution’s outreach efforts, and guidelines:

Table 6.27. Cataloguer knowledge survey results, small libraries

How knowledgeable are you on the following topics?	Case 16	Case 17	Case 20
4a. Indigenous cultures and traditional knowledge	Slightly familiar	Neutral	Knowledgeable
4b. Decolonization efforts of information organizations	Slightly familiar	Neutral	Knowledgeable
4c. Collaborative projects with Indigenous communities	Slightly familiar	Neutral	Knowledgeable
4d. Colonial biases in controlled vocabularies such as LCSH	Knowledgeable	Slightly familiar	Knowledgeable

Table 6.28. Institutional practices survey results, small libraries

Please rate the following statements regarding your institution.	Case 16	Case 17	Case 20
5a. My institution participates in decolonization initiatives.	Disagree	Strongly disagree	Disagree
5b. My institution works with local Indigenous communities in order to derive appropriate descriptive terminology and cataloguing policies.	Disagree	Strongly disagree	Strongly disagree
5c. My institution trains all employees in cultural biases and promotes sensitive and accurate language use.	Disagree	Strongly disagree	Agree
5d. My institution's participation in decolonization initiatives is affected by budgetary constraints.	Disagree	Strongly disagree	Agree

Table 6.29. Cataloguing guidelines survey results, small libraries

Please rate the following statements regarding your institution's training materials.	Case 16	Case 17	Case 20
12a. Instructions are clearly laid out and understandable.	Agree	Agree	Neutral
12b. There are sufficient guidelines for describing specific types of images.	Agree	Agree	Agree
12c. Guidelines provide additional instructions for describing culturally sensitive images.	Disagree	Neutral	Disagree
12d. My institution's policies for describing images enable culturally appropriate and accurate use of language.	Disagree	Neutral	Disagree
12e. Guidelines include additional information for describing material culture or images from non-Western cultures.	Disagree	Neutral	Strongly disagree

All respondents from small libraries found that institutional guidelines provided information about describing specific types of images; regarding guideline clarity, respondents responded neutrally or in

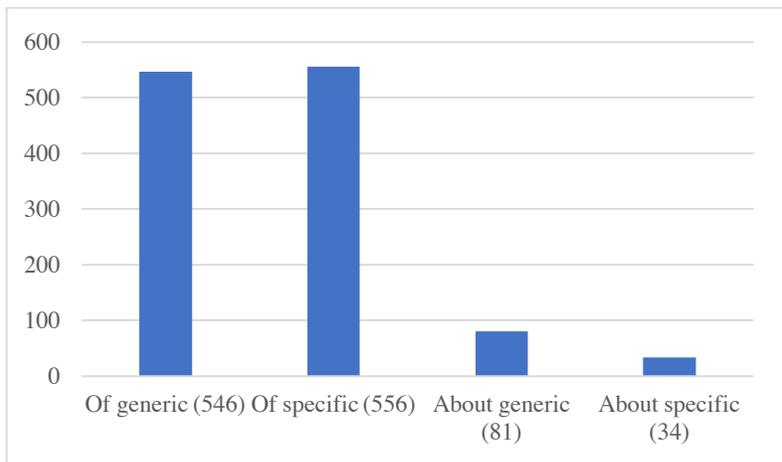
the affirmative. Responses regarding institutional outreach and Indigenous engagement practices varied widely, but all respondents answered that their institution does not participate in these types of activities. Overall, however, staff in small libraries demonstrated some amount of familiarity with LCSH bias, and in response to statements regarding their knowledge of Indigenous culture or outreach, none indicated that they were unfamiliar, unlike some respondents from large libraries. There may be a slight correlation, therefore, between the amount of appropriate language in the collections of small libraries and cataloguer familiarity with Indigenous cultures and community engagement.

As will be discussed in the next section, comparison to large libraries on some of these points are difficult due the lack of data about the cataloguing guidelines for large libraries.

6.6.2 Characteristics of large libraries.

585 of the images surveyed were in the collections of large libraries, and all of them had valid subject headings. These 585 images constitute 79.3% of all library images with valid subject headings and 63.4% of all images with valid subject headings overall. Out of these 585 images, 556 were described using *Of* specific terms (95.0% of occurrences), 546 were described using *Of* generic terms (93.3% of occurrences), 81 were described using *About* generic terms (13.8% of occurrences), and 34 images were described using *About* specific terms (5.8% of occurrences). Because there were no small library images with *About* specific terms present, large libraries account for all of the *About* specific terms present in library collections. Additionally, the small amount of *About* specific terms found in museum collections overall means that large libraries show a stronger likelihood of using *About* specific terms than another other institution type or size. The same goes for *About* generic terms in comparison to other institution types and sizes, meaning that large libraries are most likely to use *About* terms of any kind in subject headings.

Figure 6.21. Images from large libraries, by subject heading type (585 images)



Like small libraries, large libraries were most likely to use subject headings with a combination of inappropriate and neutral language (422 images, 72.1% of large library images), followed by exclusively neutral language (155 images, 26.5% of large library images), then by exclusively appropriate language (five images, 0.9% of large library images). Unlike small libraries, large libraries also had images with subject headings comprised of a combination of appropriate and inappropriate language (three images, 0.5% of large library images). There were zero images described with a combination of appropriate and neutral terminology.

All images from large library collections were described entirely with controlled vocabulary terms, or with some combination of controlled vocabulary terms and free text description. The latter combination was more common, accounting for 507 images out of 585 total images from large libraries (86.7% of images from large libraries), while images described only with controlled vocabulary terms accounted for 78 occurrences, or 13.3% of large library images. There were zero images described using only free text description, and zero images that were missing some kind of subject matter description.

The most identifiable characteristic from the survey results of large library staff is the lack of cataloguing guidelines in comparison to other types of institutions and sizes of collections. The only other institution without guidelines for image cataloguing is a large museum. Without additional information or survey results, it is difficult to determine whether this is characteristic of other large libraries. The single response regarding controlled vocabularies, however, follows the overall trend of small libraries and the use of LC controlled vocabularies, as the only vocabularies indicated in the response are LCSH and LCTGM. Large library respondents answered thusly about their knowledge, their institution’s outreach efforts, and guidelines:

Table 6.30. Cataloguer knowledge survey results, large libraries

How knowledgeable are you on the following topics?	Case 03	Case 06	Case 09
4a. Indigenous cultures and traditional knowledge	Not familiar	Slightly familiar	Knowledgeable
4b. Decolonization efforts of information organizations	Not familiar	Not familiar	Knowledgeable
4c. Collaborative projects with Indigenous communities	Not familiar	Not familiar	Slightly familiar
4d. Colonial biases in controlled vocabularies such as LCSH	Not familiar	Knowledgeable	Knowledgeable

Table 6.31. Institutional practices survey results, large libraries

Please rate the following statements regarding your institution.	Case 03	Case 06	Case 09
5a. My institution participates in decolonization initiatives.	Don’t know	Strongly disagree	Neutral
5b. My institution works with local Indigenous communities in order to derive appropriate descriptive terminology and cataloguing policies.	Don’t know	Strongly disagree	Agree

Please rate the following statements regarding your institution.	Case 03	Case 06	Case 09
5c. My institution trains all employees in cultural biases and promotes sensitive and accurate language use.	Disagree	Strongly disagree	Neutral
5d. My institution's participation in decolonization initiatives is affected by budgetary constraints.	Don't know	Don't know	Neutral

Table 6.32. Cataloguing guidelines survey results, large libraries

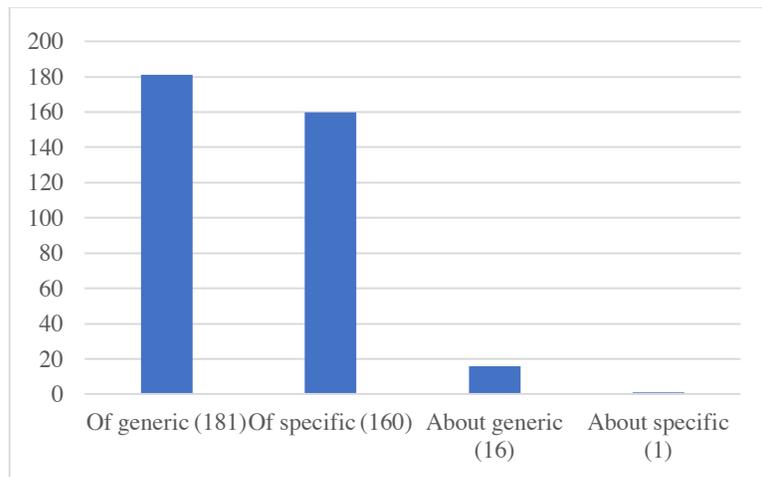
Please rate the following statements regarding your institution's training materials.	Case 03	Case 06	Case 09
12a. Instructions are clearly laid out and understandable.	Neutral	Missing (no handbook or guide)	Missing (no handbook or guide)
12b. There are sufficient guidelines for describing specific types of images.	Neutral	Missing (no handbook or guide)	Missing (no handbook or guide)
12c. Guidelines provide additional instructions for describing culturally sensitive images.	Neutral	Missing (no handbook or guide)	Missing (no handbook or guide)
12d. My institution's policies for describing images enable culturally appropriate and accurate use of language.	Neutral	Missing (no handbook or guide)	Missing (no handbook or guide)
12e. Guidelines include additional information for describing material culture or images from non-Western cultures.	Neutral	Missing (no handbook or guide)	Missing (no handbook or guide)

Overall, cataloguing staff of large libraries showed less familiarity with Indigenous cultures and Indigenous engagement initiatives than in small libraries, though familiarity with biases in LCSH were consistent across both size of library. Responses to statements regarding institutional outreach and engagement with Indigenous communities were also generally in disagreement or neutral, with few exceptions. Finally, survey data regarding institutional cataloguing handbooks is inconclusive.

6.7 Characteristics of Museums

Of the 348 images surveyed from museum collections, 184 had valid subject headings, representing 52.9% of all museum images surveyed, 16.8% of all images surveyed, or 20.0% of all images surveyed with valid subject headings. The remaining 164 images without valid subject headings represent 47.1% of all museum images surveyed, or 15.0% of all images surveyed. Out of these 184 images with subject headings, 181 were described using *Of* generic terms (98.3% of occurrences), 160 were described using *Of* specific terms (87.0% of occurrences), 16 were described using *About* generic terms (8.7% of occurrences), and one image was described using *About* specific terms (0.5% of occurrences). By a slight margin, museums are more likely to use *Of* generic terms over *Of* specific, and use of *About* terms overall are less common than in libraries.

Figure 6.22. Images from museums, by subject heading type (184 images)



Another dissimilarity between libraries and museums is the preponderance of museum images with subject terms comprised entirely of all neutral terminology, which in the case of libraries is the second most common, after a combination of inappropriate/neutral. Subject headings entirely made up of neutral terms described 166 images (90.2% of museum images), while 17 images were described using a combination of inappropriate and neutral language (9.2% of museum images), and

one image was described using a combination of appropriate and neutral language (0.5% of museums images). The reason for this is described in section 4.2, namely that the author found a correlation in neutral and *Of* terms, which are likely linked to the commonality of AAT and Nomenclature in museums, which in term describe subject matter in terms of physical traits or functionality (Harpring, 2010). There were zero images described using a combination of appropriate and inappropriate terms, and, unlike libraries, there were no museum images described using exclusively appropriate language.

Although the majority of museum images were described using exclusively controlled vocabulary terms, overall images that used all controlled vocabularies, all free text description, or some combination of the two were much more distributed than in libraries. In total, 186 images out the 348 surveyed were described using only controlled vocabulary terms, or at a ratio of 53.4%, is much more common than among library images. This was followed by 78 images with subject matter described exclusively using free text description (22.4% of all museum images surveyed), and 56 images with a combination of free text and controlled vocabulary terms (16.1% of all museum images surveyed). Finally, 28 images were missing subject matter description of any kind, accounting for 8.0% of all museum images surveyed. This preponderance of images described using free text description differed strongly from libraries, as did the number of images lacking any subject matter description. Overall, this greater variety in approach to data standardization and controlled vocabulary usage makes museum image description most distinct from library image description.

The survey results revealed that controlled vocabularies such as AAT and Nomenclature were more common among museums than libraries. five out of the eight institutions that use AAT were museums (62.5% of institutions using AAT), and all five museums that provided data regarding their controlled vocabulary usage reported using AAT. Two museums reported using Nomenclature, accounting for 40.0% of museums with data on their controlled vocabulary usage. Use of these controlled vocabularies in museums are likely due to their focus on terms that describe physical

characteristics rather than subject matter (Harpring, 2010). Two museums also reported using LCSH, again accounting for 40.0% of museums and 33.3% of institutions that use LCSH. Museum respondents answered thusly about their knowledge, their institution’s outreach efforts, and guidelines:

Table 6.33. Cataloguer knowledge survey results, museums

How knowledgeable are you on the following topics?	Case 01	Case 08	Case 10 (1)	Case 10 (2)	Case 13	Case 14	Case 18
4a. Indigenous cultures and traditional knowledge	Neutral	Not familiar	Slightly familiar	Not familiar	Slightly familiar	Knowledgeable	Knowledgeable
4b. Decolonization efforts of information organizations	Slightly familiar	Not familiar	Slightly familiar	Neutral	Knowledgeable	Neutral	Knowledgeable
4c. Collaborative projects with Indigenous communities	Slightly familiar	Not familiar	Knowledgeable	Neutral	Knowledgeable	Neutral	Knowledgeable
4d. Colonial biases in controlled vocabularies such as LCSH	Slightly familiar	Not familiar	Not familiar	Neutral	Knowledgeable	Neutral	Slightly familiar

Table 6.34. Institutional practices survey results, museums

Please rate the following statements regarding your institution.	Case 01	Case 08	Case 10 (1)	Case 10 (2)	Case 13	Case 14	Case 18
5a. My institution participates in decolonization initiatives.	Disagree	Don't know	Strongly agree	Strongly agree	Agree	Neutral	Strongly agree
5b. My institution works with local Indigenous communities in order to derive appropriate descriptive terminology and cataloguing policies.	Strongly disagree	Don't know	Neutral	Strongly agree	Agree	Neutral	Strongly agree
5c. My institution trains all employees in cultural biases and promotes sensitive and accurate language use.	Disagree	Don't know	Strongly disagree	Agree	Agree	Agree	Strongly agree
5d. My institution's participation in decolonization initiatives is affected by budgetary constraints.	Strongly disagree	Don't know	Agree	Neutral	Don't know	Neutral	Agree

Table 6.35. Cataloguing guidelines survey results, museums

Please rate the following statements regarding your institution's training materials.	Case 01	Case 08	Case 10 (1)	Case 10 (2)	Case 13	Case 14	Case 18
12a. Instructions are clearly laid out and understandable.	Missing (no handbook or guide)	Neutral	Disagree	Neutral	Neutral	Neutral	Agree
12b. There are sufficient guidelines for describing specific types of images.	Missing (no handbook or guide)	Neutral	Strongly disagree	Strongly disagree	Agree	Neutral	Neutral
12c. Guidelines provide additional instructions for describing culturally sensitive images.	Missing (no handbook or guide)	Neutral	Strongly disagree	Neutral	Agree	Neutral	Neutral
12d. My institution's policies for describing images enable culturally appropriate and accurate use of language.	Missing (no handbook or guide)	Neutral	Disagree	Strongly agree	Neutral	Neutral	Strongly agree
12e. Guidelines include additional information for describing material culture or images from non-Western cultures.	Missing (no handbook or guide)	Neutral	Neutral	Disagree	Agree	Neutral	Strongly agree

Museum respondents reported more familiarity with Indigenous cultures and community engagement than their library counterparts, but less knowledge regarding cultural biases in LCSH, perhaps

unsurprisingly due to less reported usage of LCSH among museum participants. Half of museum participants responded in the affirmative regarding institutional Indigenous outreach initiatives, as well as to the statement regarding staff training for cultural bias and accurate language use. While fewer participants reported institutional activities such as collaborative collection building, a larger percent of museum participants answered in the affirmative than library participants, as well as individual familiarity with these topics.

Much like their library counterparts, most museums respondents reported neutrality or disagreement with statements regarding institutional documentation for describing images; however, more museum respondents than library respondents agreed with statements regarding guidelines for non-Western visual culture and cultural sensitivity. This seems to indicate some consistency with institutional practice and documentation for image cataloguers.

6.7.1 Characteristics of museums with subject headings.

Due to the amount of museum images without subject headings, further inspection into museums that do describe images with subject metadata is warranted in order to determine if there are similarities between them. To more closely analyze museums that use subject headings, the museums that do have valid subject headings are as follows: case 04, case 10, case 12, case 13, case 15, and case 18.

Table 6.36. Museums with subject headings

	Collection Size	Social Tagging	No. controlled vocab	No. free text	No. controlled and free text	No. missing
Case 04	Large	No	1	19	8	8
Case 10	Small	No	0	13	1	0
Case 12	Small	No	0	5	0	1
Case 13	Large	No	141	0	0	0
Case 15	Small	No	1	3	1	3
Case 18	Large	No	0	0	54	0

While overall large libraries have a larger ratio of images with valid subject headings than small libraries, the museums that describe images with a subject field are evenly split between large museums and small museums. None of the museums with subject description have social tagging enabled in their online collections, and a review of their use of controlled vocabulary and free text usage reveals, much like the population of museum collections overall, a great variety of approaches to subject matter description. While overall images described entirely with controlled vocabularies make up the majority, the conceit of this is the concentration of such images in the large collection of case 13. Overall, therefore, it is difficult to derive from the data certain attributes that would make museums more likely to apply subject terms to images.

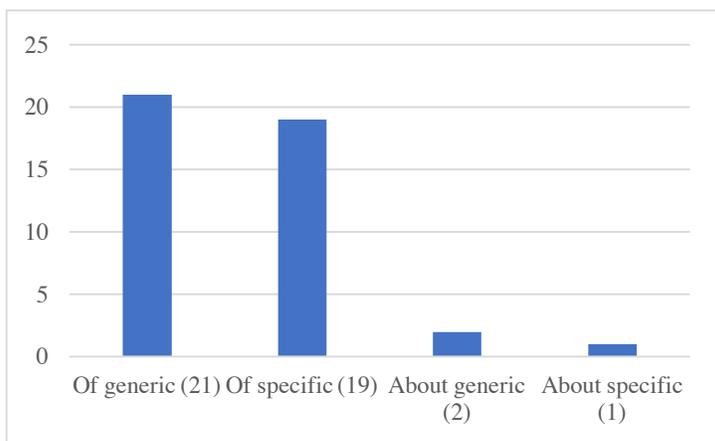
Survey respondents from cases 13, 10, and 18, did all report that their institutions provide subject access to their images, and that image description practices are outlined in guidelines and/or handbooks. While only one out of three agreed that these guidelines are clearly laid out and provide instructions on describing specific types of images, all three of these institutions use AAT to describe images. Notably, the only two respondents that reported using Nomenclature were among museums that use subject headings to describe their images, and one of the two museums that reported using LCSH were among this group as well. In comparison to the responses from museums that do not appear to have subject fields in their image metadata, however, the responses from these museums do not differ dramatically.

6.7.2 Characteristics of small museums.

59 of the images surveyed were in the collections of small museums, and 21 of those had valid subject headings (35.6% of small museum images surveyed); this means that 38 out of the total 164 images without valid subject headings were in the collections of small museums (23.2% of museum images without subject headings). These 21 images constitute 11.4% of all museum images with valid

subject headings and 2.3% of all images with valid subject headings. Out of these 21 images, all 21 were described using *Of* generic terms (100.0% of occurrences), 19 were described using *Of* specific terms (90.5% of occurrences), two were described using *About* generic terms (9.5% of occurrences), and one image was described using *About* specific terms (4.8% of occurrences). Overall, the *Of* terms followed the general museum trend of using generic terms over specific.

Figure 6.23. Images from small museums, by subject heading type (21 images)



Small museums diverged from overall museum trends by accounting for a larger number of images described with inappropriate/neutral terms than exclusively neutral terms. 13 images from small museum collections were described using a combination of inappropriate and neutral terms (61.9% of small museum images), followed by seven images that were described using only neutral terms (33.3% of small museum images), then followed by one image that was described using a combination of appropriate and neutral language (4.8%). There were zero images described using only appropriate language, or a combination of appropriate/inappropriate. It is unclear why small museums break this overall trend; additional study is required to reach a conclusion regarding institution size.

Again, small museums slightly differed from overall museum trends, as the majority of small museum images out of the total 59 surveyed had subject matter described using only free text description (21 images, 35.6% of all small museum images surveyed). Also notable is that this is followed by 19 images that are missing subject matter description entirely (32.2% of all small museum images surveyed); small museums, therefore, account for 67.9% of the 28 images that are missing any kind of subject matter description. There were 17 images with subject matter described using all controlled vocabulary terms (28.8% of all small museum images surveyed), and two images described with a combination of free text description and controlled vocabulary terms (3.4% of all small museum images surveyed). This is, perhaps, due to the assumption that smaller institutions are less likely have the resources to describe images fully; the importance of staff time and budget in describing individual images is discussed by Jørgensen (1998) and Rossetti (2013).

Although there were three small museums that provided responses to the survey, there were two respondents from case 10, for a total of four responses for small museums. While these two participants reported using different controlled vocabularies in their work, all of the vocabularies indicated are being counted toward case 10's responses. All three small museums reported using AAT, accounting for 37.5% of institutions that reported using AAT. The two museums that reported using LCSH were small museums, accounting for two out of the six institutions that use LCSH to describe images, or 33.3%. Finally, one of the two museums using Nomenclature was a small museum. Small museum respondents answered thusly about their knowledge, their institution's outreach efforts, and guidelines:

Table 6.37. Cataloguer knowledge survey results, small museums

How knowledgeable are you on the following topics?	Case 08	Case 10 (1)	Case 10 (2)	Case 14
4a. Indigenous cultures and traditional knowledge	Not familiar	Slightly familiar	Not familiar	Knowledgeable
4b. Decolonization efforts of information organizations	Not familiar	Slightly familiar	Neutral	Neutral
4c. Collaborative projects with Indigenous communities	Not familiar	Knowledgeable	Neutral	Neutral
4d. Colonial biases in controlled vocabularies such as LCSH	Not familiar	Not familiar	Neutral	Neutral

Table 6.38. Institutional practices survey results, small museums

Please rate the following statements regarding your institution.	Case 08	Case 10 (1)	Case 10 (2)	Case 14
5a. My institution participates in decolonization initiatives.	Don't know	Strongly agree	Strongly agree	Neutral
5b. My institution works with local Indigenous communities in order to derive appropriate descriptive terminology and cataloguing policies.	Don't know	Neutral	Strongly agree	Neutral
5c. My institution trains all employees in cultural biases and promotes sensitive and accurate language use.	Don't know	Strongly disagree	Agree	Agree
5d. My institution's participation in decolonization initiatives is affected by budgetary constraints.	Don't know	Agree	Neutral	Neutral

Table 6.39. Cataloguing guidelines survey results, small museums

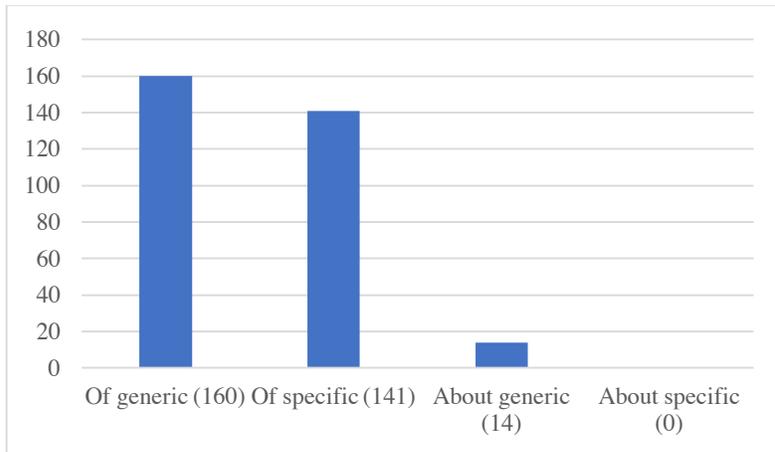
Please rate the following statements regarding your institution’s training materials.	Case 08	Case 10 (1)	Case 10 (2)	Case 14
12a. Instructions are clearly laid out and understandable.	Neutral	Disagree	Neutral	Neutral
12b. There are sufficient guidelines for describing specific types of images.	Neutral	Strongly disagree	Strongly disagree	Neutral
12c. Guidelines provide additional instructions for describing culturally sensitive images.	Neutral	Strongly disagree	Neutral	Neutral
12d. My institution’s policies for describing images enable culturally appropriate and accurate use of language.	Neutral	Disagree	Strongly agree	Neutral
12e. Guidelines include additional information for describing material culture or images from non-Western cultures.	Neutral	Neutral	Disagree	Neutral

The respondents from small museums showed a broader spread of familiarity with Indigenous cultures and community engagement than the overall museum trend. While half agreed with the statement that their institution participates in Indigenous outreach efforts, responses varied regarding collaborative collection development and budgetary constraints for undertaking such projects. Half of the respondents reported that their institution provides training regarding cultural biases and appropriate language, though statements regarding documentation of policies surrounding cataloguing and appropriate language use or cultural sensitivity were not as widespread. In all, the vast majority of small museum participants responded neutrally to statements regarding their institution’s cataloguing guidelines.

6.7.3 Characteristics of large museums.

289 of the images surveyed were in the collections of large museums, and 163 of those had valid subject headings (56.4% of large museum images surveyed); this means that 126 out of the total 164 images without valid subject headings were in the collections of large museums (76.8% of museum images without subject headings). These 163 images constitute 88.6% of all museum images with valid subject headings and 17.7% of all images with valid subject headings. Out of these 163 images, 160 were described using *Of* generic terms (98.2% of occurrences), 141 were described using *Of* specific terms (86.5% of occurrences), 14 were described using *About* generic terms (8.6% of occurrences), and zero images were described using *About* specific terms. Overall, the *Of* terms followed the general museum trend of using generic terms over specific.

Figure 6.24. Images from large museums, by subject heading type (162 images)



All large museum images were described either using entirely neutral subject terms, or a combination of inappropriate/neutral language. There were 159 images with subject terms that were all neutral (97.5% of large museum images with valid subject headings) and four images with a combination of neutral and inappropriate language (2.5% of large museum images). There were zero images with subject headings that were exclusively appropriate, appropriate/neutral, or appropriate/inappropriate.

In comparison to small museums, large museum images were described much more frequently with entirely neutral language. Additional investigation into the relationship on collection size might explain this discrepancy.

Large museums also differed from small museum insofar as the majority of images had subject matter described using exclusively controlled vocabulary terms (169 images out of 289 images surveyed; 58.5% of all images from large museums surveyed). 57 images were described using only free text description (19.7% of all images from large museums surveyed), 54 images were described using the controlled vocabulary/free text combination (18.7% of all images from large museums surveyed), and nine images were missing subject matter description of any kind (3.1% of all images from large museums surveyed).

Out of the three respondents from large museums, only two provided information about their controlled vocabulary usage. Both of these museums use AAT, while one uses Nomenclature. One respondent also reported using Iconclass, and the other respondent reported that their subject lexicons were their weakest, despite using controlled vocabularies such as Getty Geographical Thesaurus for other fields.

Large museum respondents answered thusly about their knowledge, their institution’s outreach efforts, and guidelines:

Table 6.40. Cataloguer knowledge survey results, large museums

How knowledgeable are you on the following topics?	Case 01	Case 13	Case 18
4a. Indigenous cultures and traditional knowledge	Neutral	Slightly familiar	Knowledgeable
4b. Decolonization efforts of	Slightly familiar	Knowledgeable	Knowledgeable

How knowledgeable are you on the following topics?	Case 01	Case 13	Case 18
information organizations			
4c. Collaborative projects with Indigenous communities	Slightly familiar	Knowledgeable	Knowledgeable
4d. Colonial biases in controlled vocabularies such as LCSH	Slightly familiar	Knowledgeable	Slightly familiar

Table 6.41. Institutional practices survey results, large museums

Please rate the following statements regarding your institution.	Case 01	Case 13	Case 18
5a. My institution participates in decolonization initiatives.	Disagree	Agree	Strongly agree
5b. My institution works with local Indigenous communities in order to derive appropriate descriptive terminology and cataloguing policies.	Strongly disagree	Agree	Strongly agree
5c. My institution trains all employees in cultural biases and promotes sensitive and accurate language use.	Disagree	Agree	Strongly agree
5d. My institution's participation in decolonization initiatives is affected by budgetary constraints.	Strongly disagree	Don't know	Agree

Table 6.42. Cataloguing guidelines survey results, large museums

Please rate the following statements regarding your institution's training materials.	Case 01	Case 13	Case 18
12a. Instructions are clearly laid out and understandable.	Missing (no handbook or guide)	Neutral	Agree
12b. There are sufficient guidelines for describing specific types of images.	Missing (no handbook or guide)	Agree	Neutral
12c. Guidelines provide additional instructions for	Missing (no handbook or guide)	Agree	Neutral

Please rate the following statements regarding your institution's training materials.	Case 01	Case 13	Case 18
describing culturally sensitive images.			
12d. My institution's policies for describing images enable culturally appropriate and accurate use of language.	Missing (no handbook or guide)	Neutral	Strongly agree
12e. Guidelines include additional information for describing material culture or images from non-Western cultures.	Missing (no handbook or guide)	Agree	Strongly agree

Cataloguing staff at museums with large collections of Indigenous visual cultural reported the highest familiarity with Indigenous cultures and outreach initiatives than any other group of respondents. The respondent from case 01 tended to differ from the respondents from cases 13 and 18, not only because they did not report having a cataloguing guideline or handbook, but also because they disagreed with statements regarding their institution's participation in Indigenous outreach initiatives. Additionally, the respondents from cases 13 and 18 responded either neutrally or affirmatively to the statements about their institutions' cataloguing handbooks. These responses in particular show a strong degree of consistency between cataloguer familiarity with Indigenous cultures, institutional practices, and image cataloguing policies.

6.8 Conclusion and Hypotheses, Revisited

To conclude the analysis of data gathered on institutions, images, and survey participants, it is important to turn back to the hypotheses made at the beginning of the study and determine which have been supported, challenged, or made more complex. In many of these hypotheses, the data supports the claim in some contexts but not others, or is made more complex by a more nuanced understanding of image indexing in practice, and as an activity undertaken by individuals working

within different institutional contexts. The data gathered paints a much more complex picture regarding language biases, museum data standardization, the nature of subject matter within various institutional contexts, and the implications of greater institutional engagement with Indigenous communities than anticipated at the beginning of the study.

Table 6.43. Hypotheses, findings, and results

Hypothesis	Findings	Results
Overall, cataloguers of images of Indigenous visual culture follow the Panofskian <i>Of/About</i> model.	While the results are not explicit about this hypothesis, overwhelming use of AAT as reported by survey respondents demonstrate adherence to a controlled vocabulary that extolls a cataloguing methodology similar to Shatford's (McFadden & Tschann, 1994). It is important to note that AAT also has an emphasis on generic subject terms and terms regarding the physicality and provenance of objects depicted in images (Harpring, 2010).	Inconclusive (not enough data) Likely true
Image collections of Indigenous visual culture are more likely to employ generic and content-based subject terms for indexing.	Content analysis showed that library image collections depicting Indigenous subjects and ceremonies were more likely to use specific <i>Of</i> terms, but more generic <i>About</i> terms. Museum image collections were more likely to use generic <i>Of</i> and <i>About</i> terms. The more overwhelming pattern was the increased usage of <i>Of</i> terms overall, and relatively rare usage of <i>About</i> terms, regardless of their specificity and or institutional context.	Mixed results <i>Of</i> terms: Not supported <i>About</i> terms: Supported
Image collections of Indigenous visual culture are likely to use free text description instead of subject term indexing.	The results show that is both true and false: false, because free-text description on its own was used less frequently than controlled vocabulary indexing on its own. However, the combination of controlled vocabulary and free text description was most commonly used overall, particularly in libraries. Therefore, use of controlled vocabulary terms and free text description is less "either/or", but rather a case of "both/and".	Mixed results, generally not supported: Controlled vocabularies used more overall; usually in combination rather than instead of free text
Small collections and institutions with limited cataloguing staff are likely to have minimal indexing.	This is true of museums overall, but it is particularly true of small museums. Survey data showed that small museums had the smallest cataloguing teams. Content analysis showed that small museum collections were the least likely to have valid subject	Small museums: Supported Small libraries: Not supported

Hypothesis	Findings	Results
	fields and were the most likely to be missing subject matter description of any kind.	
Large collections are more likely to use controlled vocabularies.	This is true of large institutions overall, and in contrast, the opposite is true particularly of small museums. While small libraries had a very small part of their collections missing controlled vocabulary terms from subject fields, small museums were more likely than any other type of institution to be missing subject matter description of any kind and to describe subject matter using free text.	Supported
Libraries are more likely to use controlled vocabularies and traditional subject heading systems.	Content analysis results showed a much more complex view of controlled vocabulary and subject heading usage. Museums were very likely to use controlled vocabularies to describe the subject matter of images, but were less likely to have traditional subject fields overall.	Controlled vocabularies: Not supported Subject headings: Supported
Museums are less likely to use controlled vocabularies overall, but are likely to use vocabularies such as AAT or Nomenclature which focus on physical attributes of objects.	Content analysis and survey results confirmed the second part of this hypothesis, but complicated the first half. Museums were not less likely to use controlled vocabularies, but were less likely to have traditional subject fields, as discussed above.	Controlled vocabularies: Not supported AAT and Nomenclature: Supported
Institutions that work with Indigenous communities are likely to incorporate accurate, more respectful subject headings such as FNHL or local vocabularies.	Content analysis data and survey data is generally inconclusive. No participants reported using FNHL subject headings. Cases 10, 13, and 18 were found to have a correlation between accurate language use and institutional outreach activities.	Inconclusive (not enough data) Likely supported
Cataloguers at institutions which have strong relationships with local Indigenous communities are more likely to be trained on and aware of Western bias in description and to employ systems like FNHL or local vocabularies.	Although the data on this point is limited, it appears that there is some consistency between institutional outreach efforts, cultivation of relationships with Indigenous communities, and the presence of training and cataloguing practices that are inclusionary. However, FNHL subject headings were not confirmed to be in use at any of the cases.	Inconclusive (not enough data) Likely supported
Libraries are more	Museums were slightly more likely to have image	Not supported

Hypothesis	Findings	Results
likely than museums to train cataloguing staff on indexing models and approaches, and to have uniform guides and handbooks for staff to consult.	cataloguing handbooks; however, library survey respondents tended to agree more with statements regarding handbook clarity and instructions for describing specific type of images. However, museum guidelines tended to have more information about cataloguing non-Western visual culture, using accurate language, and cataloguing culturally sensitive images.	
Institutions with small collections are likely to employ novice cataloguers and offer little training.	Survey data was inconclusive—all respondents were experienced cataloguers, and responses regarding staff training were varied. However, all three respondents that reported having no image cataloguing handbook were from large institutions; one large museum and two large libraries.	Inconclusive (not enough data)
Museums are more likely to enable social tagging in image collections.	False. Only one museum survey respondent reported having social tagging enabled, and institutional website content analysis revealed that the institutions that visibly had social tagging on their online collections were libraries using CONTENTdm as their content management system and had the tagging functionality on that platform enabled.	Not supported
Image collections which crowdsource description from Indigenous communities are more likely to use subject headings which are culturally sensitive and accurate.	Between website content analysis and survey results, the cases engaging with Indigenous communities for description and/or collaborative collection building are cases 05, 09, 10, 12, 13 16, and 18. Most of these cases use descriptive language from across the inappropriate-neutral-appropriate spectrum, although cases 13 and 18 appear to support this hypothesis.	Inconclusive (not enough data) Likely supported

7. Discussion

Given the complexity revealed in the analysis, there are several topics which require additional discussion and contextualization in the literature, particularly the nature of subject headings between libraries and museums, the limitations of controlled vocabularies, the development of expertise among museum and library professionals, the nature of materiality of online collections and its relationship to Western and Indigenous epistemologies, and finally, a more nuanced understanding of models for image description within this paradigm.

7.1 Libraries and Museums: On the Nature of Subject Headings

The author's observation and the image content analysis data shows very clearly that the notion of "subject access" is one that remains firmly in the purview of libraries rather than museums, with some exceptions. As discussed in section 2.7.1, there are several reasons for the differences that exist between library and museum metadata, and particularly for subject access. Trant (2006) suggested this is because museum administrative functions do not necessitate subject access; Timms (2009) added that the unique nature of museum collections make cataloguing more arduous and time-consuming, thus necessitating more sparse indexing practices; Allen and Bishoff (2002) posited that the need for security and competition with the tourist industry prevents museums from providing intellectual control to their collections; and Taylor (2010) simply stated: "The work of the academy has fallen short in creating meaningful solutions that acknowledge the realities of most museums" (p. 176). Indeed, Taylor (2010) described subject access in particular as "problematic" (p. 176), and asserted that while this "hold-over from *Anglo-American Cataloguing Rules* [second edition]" (p. 176) has perhaps satisfied the cataloguing community, this has done little to solve the indexing problems inherent in museum collections, such as the one-size-fits-all solutions for collections with broad discipline-specific needs and orientations; a history of insufficient collection documentation;

and technological roadblocks to converting internal paper-based object records to public, online entries for digital surrogates of objects.

Image content analysis showed, however, that controlled vocabulary usage was common among museums, and the survey results showed the dominance of Getty AAT in museum cataloguing practices. However, when considering the administrative needs of museums and thereby their understanding and conception of their collections, the inclusion of fields such as provenance, materials, and techniques demonstrate ways of understanding the subject matter of a digital surrogate or an object that is much broader than the narrow traditional library conception of “Subject”. When considering the library bibliographic records representing, for example, historical photographs and portraits, labeling that image as “*Of*” a photographic process complicates Shatford’s method, when the purpose of the identification of what an image is “*Of*” considers only the two-dimensionality of a photograph and the presence of figurative representations captured in the image. Comparing this to print materials in a library’s collection is similar to documenting binding or production methods of a bound journal as a means of browsing and identifying journals with a similar subject. It is important to note in these cases that the notion of “Subject” in library records is a conceit that may provide intellectual access for print materials, but is indeed a problem that some museums remedy through metadata fields such as “Technique” or “Materials”.

While this differing understanding and execution of “Subject” fields in metadata schema makes comparison between libraries and museums challenging, it certainly reveals differences in data standardization between cultural heritage institutions. In their study of museums and galleries, Lim and Liew (2011) found that lack of funding and staff knowledge of metadata creation produced records that were inconsistent or incomplete. While the current study did not attempt to capture completeness of metadata creation, the content analysis of the images revealed that subject matter description, regardless of its validity as “Subject”, was executed by museums through a variety of

descriptive practices; museums did this most frequently using controlled vocabulary terms exclusively, but also utilized free text description much more frequently than library counterparts. Indeed, these libraries showed a high degree of data standardization and consistency in access points for images, with nearly all including subject headings, and with subject matter described using a combination of controlled vocabulary terms as well as free text description. Choi and Hsieh-Yee further complicated the effectiveness of this practice, however, when finding that neither LCSH nor free text description supported most image queries, and that LCSH in particular only returned results when made broad enough to provide a high volume of irrelevant results (2010). Overall, while the general library approach to image subject matter belies this AACR2 hold-over that can indeed be problematic, it also produces records with a high degree of consistency and, mostly likely, interoperability.

Another inconsistency among museum subject headings was the dispersal of terminology along the inappropriate-neutral-appropriate continuum, while many images from library collections were described with a combination of inappropriate and neutral terms. Libraries' emphasis on consistency and standardization can also produce, therefore, many records that continually organize images in ways that are problematic and reflect a single epistemology.

7.2 “Indians of North America”

Image content analysis showed that repeatedly, images in library collections were described using inappropriate and neutral terminology, which was less common among museums. While the current study did not include coding for specific subject headings, throughout the course of the study the author noted that the majority of library images that were coded as having inappropriate terminology was due to one LCSH term in particular: “Indians of North America”. Without a doubt, the reliance of

libraries on LCSH for subject description led to this infliction of inappropriate terminology on Indigenous visual culture in almost every library collection surveyed.

The author's reasons for coding this term as inappropriate are described in section 4.2; but in summation, the inappropriateness of this term in context is that it denies Indigenous self-determination, undermines the multiplicities of Indigenous identity, and imposes Western epistemologies on Indigenous subjects and visual culture. Additionally, the problematic nature of this subject heading speaks to the larger history of LCSH and the biases that are implicit in its construction (Berman, 1993; Olson, 2002).

It is important to note that the intellectual control that LCSH imposes is at the expense of several other groups marginalized in libraries and cultural heritage institutions. This is because metadata "as language, should be understood as socially constructed, both shaping and shaped by the contexts in which it is applied" (Farnel, 2017, p. 6). Indeed, as Olson pointed out in their seminal work on library classification and cataloguing systems, *The Power to Name*, "naming is the act of bestowing a name, of labelling, of creating an identity. It is means of structuring reality. It imposes a pattern on the world that is meaningful to the namer" (2002, p. 4), and asserted that this process places the librarian or information professional between users and information. Olson also made the point that the namer's meaning is especially poignant when considering the intentionality of these namers to escape their own subjecthood by creating a vocabulary that is supposedly universal (2002). As Farnel noted, "close examination has revealed that more often than not, the worldview represented in such structures is that of the dominant social group or groups within a given community" (2017, p. 15), and this process mirrors the cultural imperialism that Roy, Hogan, and Lilley (2012) stated comes along with land-based systems of colonial oppression for Indigenous communities.

In presuming a singular public voice, Dewey and Cutter—the forefathers of library classification—further silenced marginalized voices, and the interposing of subject and object allowed libraries to name what fell within this singular public epistemology while denying identity of that which fell outside of it (Olson, 2002). LCSH therefore “influences how people in libraries throughout our globalized information infrastructure find information by subjects” (Olson, 2002, p. 143). When difference cannot be named or identified in this system, distinct Indigenous voices, communities, histories, and epistemologies are erased and are flattened into labels such as “Indians of North America”. This lack of agency within LIS structures is undoubtedly harmful to Indigenous creators, but also serves to perpetuate misunderstandings and prejudices by non-Indigenous library users; indeed, this seeming authorization of inaccurate and offensive misinformation by information professionals “engenders mistrust and damages librarians’ credibility with knowledgeable library users” (Doyle, Lawson, & Dupont, 2015, p. 115).

For the sake of interoperability and universality, libraries instead continue this process of erasure, and in many cases, librarians are obedient to the “authority” that the term “authority controls” implies (Olson, 2002). While the use of controlled vocabularies to derive a cataloguer’s expertise will be discussed in the following section, it is important to reflect on the ways in which other metadata elements beside “Subject”, or even other subject heading systems, can serve as a counterbalance to problematic language in controlled vocabularies. Free text description fields can allow cataloguers to incorporate terminology or concepts in subject matter description that is not possible using LCSH alone. As Doyle, Lawson, and Dupont (2015) pointed out, the multiplicity of controlled and uncontrolled vocabularies allows the authors to show students how to “critically evaluate the sources and motivations of knowledge creators” (p. 124). Additionally, as Littletree and Metoyer point out, because “LCSH for Indigenous topics are often less than acceptable, several Indigenous approaches to thesauri and classification schemes have been developed” (2015, p. 642). These ongoing efforts,

which include the FNHL subject headings, work to augment the limitations of LCSH and to enable users to browse and discover materials relevant to Indigenous communities with accuracy.

While the legacy of Dewey and Cutter may seem far away from the records that describe Indigenous visual culture, the data from image content analysis shows the sharp relief between libraries and museums regarding usage of LCSH and the prevalence of inappropriate language among library description. Data analysis and the author's observation demonstrate the correlation between data standardization, reliance of LCSH in libraries, and the frequency of inappropriate language in image subject metadata. While none of the libraries with associated survey responses reported using a controlled vocabulary such as FNHL subject headings, further study might reveal the importance of these lexicons in relationship to subject access.

7.3 On Expertise

While the limitations of LCSH were familiar to the library survey participants, the consistent use of LCSH by libraries and AAT by museums demonstrates the ways in which the professional expertise of the cataloguer is reinforced through the use of controlled vocabularies. As discussed in section 7.1, the concept of "Subject" is indeed subject to the professional expertise and attitudes of library and museum professionals, and the controlled vocabularies that are used in subject fields are dependent on the administrative functions, metadata schema, and cataloguing practices of each community of professionals. As the survey results demonstrated, while museums and libraries used LCSH and AAT most frequently overall, concentrated usage of AAT in museums and LCSH in libraries demonstrates the ways in which professional attitudes and expertise influence cataloguing practices.

Even guidelines such as CCO, which are meant to help develop the skills and expertise of the cataloguer, frequently reference the Getty vocabularies and the establishment of in-house lexicons

(Baca, Harpring, Lanzi, McRae, & Whiteside, 2006). Because images of architecture or the decorative arts frequently lack figurative or narrative representations, therefore making their subject matter more closely tied to their physical form and functionality, the Getty and CCO recognize the problematic nature of identifying the “Subject” of these media, but recommended using their functions—such as container or structural support—as a type of “Subject” as a means of maintaining additional access points for users (Harpring, 2002; Baca, Harpring, Lanzi, McRae, & Whiteside, 2006). The overall practice of indexing, however, “should be a conscious activity performed by knowledgeable catalogers who consider the retrieval implications of their indexing terms, and not by an automated method that simply parses every word in a text intended for display into indexes” (Baca & Harpring, 2014, n.p.).

Cataloguing skill, therefore, is dependent on the indexer’s ability to anticipate user queries and understand the technical infrastructure that their work is bound within. As the data collection from institutional content analysis and surveys showed, this anticipation of user needs and queries is not aided through social tagging, particularly in the case of museums, despite the disconnect found in the indexing practices of professionals and taggers (Stewart, 2013; Choi & Hsieh-Yee, 2010; Stvilia, Jørgensen, & Wu, 2012). Additionally, the CCO asserted that the institutional context should be taken into account when considering specificity, exhaustivity, ambiguity and uncertainty, organization of data, and use of subject authorities for image description (Baca, Harpring, Lanzi, McRae, & Whiteside, 2006), meaning that library and museum professionals’ expertise is also rooted in their understanding of their particular institutional context. Despite this, data gathered from many survey respondents demonstrated dissatisfaction with the clarity of their institution’s image cataloguing guidelines, and some reported that such documentation did not exist.

When considering library and museum convergence, Given and McTavish (2010) found it imperative that LIS and Museum Studies graduate programs have common training and curriculum in order to

share this expertise and improve the gathering and dissemination of knowledge and cultural heritage. However, for professionals in institutions with a large degree of library/museum hybridity and which are merging together library and museum systems, data standardization is a problem without a clear solution (Duff, Carter, Chery, MacNeil, & Howarth, 2013). The differences in free text description, controlled vocabulary usage, and valid subject heading access in the data gathered demonstrated the difficulty which might arise from mapping differing approaches to cataloguing and documentation between libraries and museums. Given these challenges, there appears to be little consideration for the expertise of individuals outside the library and museum profession and beyond the divide of domain-specific controlled vocabularies, particularly as demonstrated by the lack of survey participants that affirmed their institution's collaboration with Indigenous communities and employment of folksonomic description.

This conception of expertise evokes Olson's question offered for library professionals, but which this study offers to cultural heritage professionals in general; do they "refuse to hear what is outside of a constructed unified language?" (2002, p. 5). While the data gathered from museum survey respondents showed a stronger correlation between institutional outreach and respondent knowledge about Indigenous cultures, the majority of images demonstrated the obedience to subject authorities that is dictated by an understanding of professional and cataloguing practice as rooted in the successful utilization of controlled vocabularies and an understanding of technical infrastructures that digital surrogates are organized within. Olson's question within the broader scope of these best practices considerations also begs the question: How does cultural sensitivity fit into this conception of professional expertise? Much of the data gathered from the library respondents demonstrated some familiarity with the biases that exist in LCSH, but how can cataloguers use controlled vocabularies successfully to not only facilitate retrieval but to also help users to hear what exists outside of this constructed unified language? In essence, how can expertise be critical of and subvert, rather than reinforce, the silencing of marginalized voices that has pervaded many of these subject authorities?

Olson (1997) posited that while a holistic understanding of a catalogue or content management system, its schema, the standards governing each field, and its service to users is integral to any cataloguer, teaching this to professionals must also include a critical perspective on the mediating role between user and collection that a digital asset management system or integrated library system plays. This means “a freedom from preconceptions that allows the understanding and analysis of other perspectives. Critical thinking is based on critical knowledge—a knowledge that our practice and our theory are only some of the possible ways of linking users and information” (Olson, 1997, p. 52). Olson stressed that this is particularly important for cataloguing “Subject” fields, and that an understanding of applying LCSH means not only applying its rules in practice, but also understanding institutional context and changing or even omitting subject headings that will not aid users (1997). When considering curricula for future cataloguing professionals, this means accepting that LCSH does not always have the “right answer” (Olson, 1997, p. 54) when referring to marginalized groups. This type of training harkens to Doyle, Lawson, and Dupont’s (2015) efforts to promote critical appraisal among students and researchers of First Nations materials as an essential information literacy; indeed, if users must gain this expertise to traverse the landscape of subject and naming authorities, it seems firmly within the professional’s purview to understand and navigate these terms in order to facilitate retrieval, serve all user populations, and describe all collections effectively.

While the survey data did show some cases where accurate and culturally sensitive language use and cataloguing practices for non-Western visual culture were a part of staff training and handbooks, overall, most respondents answered neutrally to or disagreed with these statements. In a few cases, particularly in the image content analysis findings and survey response from case 20, cataloguers possessed individual expertise that contributed to their ability to describe Indigenous visual culture. However, in sum survey participants expressed disagreement with statements regarding the presence of institutional documentation and guidelines for cataloguing Indigenous visual culture and culturally

sensitive language use, which might support cataloguing critically in the context of the institution's collection.

This discourse surrounding critical practices in collection management and cataloguing in libraries and museums acknowledges “that routine cataloguing is an intellectual practice and that managing the data held within computer databases is a complex negotiation among technology, history, and epistemology” (Turner, 2016a, p. 164). Increased attention to the ethical implications of museum documentation and the historicity of collections practices has brought increased awareness into the profession (Turner, 2016b); in their Collections Management classroom, Krmpotich demonstrated the way in which industry standard software and lexicons such as Nomenclature 3.0 can inhibit cataloguing practice and prevent the indexer from giving the user an accurate and bias-free description of an object, pointing out that an overemphasis on the function of an object reflects only a singular understanding of that object's function (2015). An essential skill for cataloguing critically, then, is an understanding of the technology that circumscribes indexing practices and the ways in which this can be improved in the future and subverted in the present.

7.4 Images and Objects: Materiality and Online Collections

Understanding image description and subject access in libraries and museums, and particularly approaching it in a critical way, is only possible when one understands the interplay of images, professionals, and users as mediated by technology. An additional dimension to this network is that of the originating culture and the affective response of objects in space compared to images in databases, such as Howarth and Knight's (2015) experience documenting the interplay of object, memory, and intergenerational discussion when cataloguing a collection of Indigenous hand-crafted objects, as discussed below.

Olson described a methodology for critical cataloguing called “techniques”, which “will breach the limit to create space for the voice of the *Other*” (2002, p. 227). These techniques treat limitations as penetrable, make spaces for those who are marginalized to fill, and are reflexive and dynamic; they do not place blame on the limits of LCSH for accurately naming marginalized groups or concepts that exist outside of its epistemic boundaries, but merely treat those limitations as permeable (Olson, 2002). In using technology to fit these techniques, “we can use the master’s technological tools to create redemptive technologies” (Olson, 2002, p. 231).

When considering images, the limitations of technologies and the abilities of techniques to supersede them are a challenge for libraries and museums. This, in part, is due to the chasm that exists between the user seeking images in a database, and the cataloguer describing objects. One survey respondent asserted that they describe artworks rather than images, revealing the mediation of technology and flattening of art or ethnographic objects and photographs alike. As Sassoon asserted, digital surrogates of analogue photographs deny the corporeality of the medium, often creating what Sassoon called a “digital ghost” (2005, p. 200), wherein photographic objects became one-dimensional aesthetic mediums rather than three-dimensional objects. Objects, additionally, act as “part of an object-information package; indeed, in such a framework the museum object properly conceived is not the physical thing alone at all, but comprises the whole package” (Dudley, 2010, p. 3). Dudley questioned, however, how the emphasis on the visual in museum displays prevents visitors from understanding and empathizing with the creators of museum objects (2010). Taylor considered this from the perspective of the digital surrogate, which further removes an object from its material properties (2010). While the controlled vocabularies employed by museums such as AAT and Nomenclature attempt to account for these physical characteristics, where technology sometimes prevents effective retrieval of digital surrogates, it completely neglects the affective qualities that these objects possess (Taylor, 2010).

This is particularly true of Indigenous material culture and object collections. Howarth and Knight (2015) found that the interaction between handcrafted objects and Indigenous seniors “confirmed the inherent capability of objects to evoke memory, to elicit personal narratives, and to encourage individual and group storytelling. Sessions also reinforced the power of reminiscence to foster opportunities for social engagement and to enhance an individual’s sense of self-efficacy and self-worth” (p. 588). Lawson (2004) echoed the importance of memory and story-telling for Indigenous cultural knowledge as told by Indigenous information professionals. When considering the limitations of library and museum technologies and the notion of subject matter or the meaning of an image or digital surrogate, there is a sense that spaces for these voices and stories to fill is imperative, provided that they are not restricted by specific cultural knowledge protocols (Lawson, 2004). Howarth and Knight proposed that the traditional library and museum process of creating surrogates in order to serve specific access of administrative needs should be reconsidered in favor of a surrogate that “supports the voice of a *meaning*-maker over that of a professional *meaning*-maker” (Howarth and Knight, 2015, p. 593).

In acknowledging the connection between meaning, materiality, and technology, Krmptich and Somerville explored “the affective relationship between material culture and human bodies” (2016, p. 178). The authors noted the ways in which controlled vocabularies such as Nomenclature 3.0, which is focused and arranged according to the function of an object, removes the affective qualities of objects (Harpring, 2010; Krmptich & Somerville, 2016). By classifying the *tikinaagan*, or cradle board, as a vehicle, the presence of “childrearing—a highly affective and purposive human activity frequently associated with women—is absent” (Krmptich & Somerville, 2016, p. 179). While museum-centered study advocates for the importance of these affective qualities that objects have, the authors pointed out that museum records are greatly limited by standards and best practices to describe them and provide access to them (Krmptich & Somerville, 2016). Additionally, this more firmly removes source communities from the housing and display of their material culture by

excluding this type of understanding and response to objects (Krpmotich & Somerville, 2016). For users of online collections, whether they are Indigenous or not, removal from the object itself is a denial of this affective and multi-sensory experience; Krmpotich and Somerville pointed out that “if affect is always in a state of becoming, certain languages can tend to demarcate and fix a moment in time or space; such languages can deny the process of always becoming” (2016, p. 187). Therefore, redemptive technologies that express affect must also be capable of spanning time, and linking the past and present lives of objects both before, during, and after their presence in museum collections (Krpmotich & Somerville, 2016).

In the photographic archive, understanding the affective quality of ethnographic photographs reveals how portraits of Indigenous subjects push the “boundaries and possibilities for negation, resistance, reinterpretation, and the play of metaphoric invention; these purposefully extend a dialogue in utterances and tones that we assimilate, rework, and re-accentuate” (Paakspuu, 2016, p. 312). Though intended to situate Indigenous subjects in settler colonialist epistemologies and understandings of an essentialist “Indianness” (Lyman, 1982), photographs have the power to bring together past and present for future generations and to spark intergenerational dialogue (Paakspuu, 2016). The performativity of the subjects of these portraits reveals less about the authenticity of the image and more about the experience and presence of Indigenous subjects during these points of contact with settler colonialist epistemologies and their disruption of the subject-object power relations “that exist between the observer and observed in the initiation of a visual dialogue” (Paakspuu, 2016, p. 333). The reactivation of photographic archives by Indigenous artists and scholars “enact[s] a cultural negotiation between Aboriginal peoples and the realities of historic colonialism and neo-colonialism.” (Payne & Thomas, 2002, p. 110). Much like collections of Indigenous material culture, the affective response of Indigenous creators to photographic archives creates spaces to activate memory and promote deeper understanding.

An affective approach to cataloguing and adaptation of museum and library technologies can help the viewer of an image in an online collection bridge the gap between image and object. It can also help cultural heritage institutions understand and follow the example of Peters's (2016) embodied library, wherein knowledge is expressed and transmitted through generational connections, oral traditions, and the presence of objects which rely on one's lived environment. Techniques and technologies for describing images of objects that incorporate the dynamic and affective nature of knowledge in Indigenous epistemologies do more than provide subject access for users or successfully overcome the semantic divide between image and text; in the embodied library and embodied museum, image and object are accessible to users and to community members in ways that more closely reflect their material presence and the knowledge that they contain.

This is not to suggest that technology is a panacea for the legacy of cultural imperialism, theft, and erasure that exists between cultural heritage institutions and Indigenous communities. As Aaron Glass pointed out, for many Indigenous peoples, current digital projects which seek to remediate this history and to situate objects and their digital surrogates in technologies which reflect Indigenous epistemologies may not satisfy those who wish to see culturally significant objects returned (2015). Firstly, these "digitally repatriated" items may still be circumscribed and imbued with the technologies and mediations of the people and institutions that formerly held them, and secondly, "there is the danger that virtual return becomes assumed a priori by institutions to be a viable alternative to repatriation claims in every case, thereby deflecting attention or strength from requests for physical return" (Glass, 2015, p. 23). However, for many museums and libraries, in tandem with outreach activities and continued repatriation efforts, harnessing technologies that formerly disenfranchised Indigenous communities and superimposed Western epistemologies on them provide an opportunity to push past the limitations of that technology alongside, and with the leadership of, Indigenous partners.

7.5 Considering Image Description Models

For many, current models for image description and imposition of the subject field on images do not work for users and do not suit the needs and understandings of museum professionals. Furthermore, they do not create spaces for Indigenous epistemologies and the development of affective and intergenerational knowledge. Panofsky (1962) described “iconographical” analysis, upon which *Aboutness* is based, as centered on the allegorical or the abstract; moreover, Panofsky developed this methodology to describe works from the Renaissance, a period and society that was centuries passed. How, then, can this conception of subject matter be applied to objects meant to convey ongoing knowledge that, rather than abstract or allegorical in nature, is embodied and in people, places, and objects? Indeed, the language of *Of* and *About* does not seem to accommodate concepts such as affective presence, “an attention to sensorial engagements between things and human bodies in which materials and motion matter and inform our understanding of the past and present” (Krmptich & Somerville, 2016, p. 179).

Indeed, in their discussion of information and knowledge as understood by Indigenous information professionals, Lawson (2004) found that many of the experts consulted described information in terms of aboutness, also indicating that information is fragmentary and unprocessed. Lawson’s (2004) study showed that these Indigenous information professionals discussed knowledge, in contrast, as something more than information, that it was information which had been internalized, experienced, processed, and connected to one’s worldview. Adopting Panofsky’s system of *Of* and *About* therefore forecloses on the ability for describing and depicting subject matter in this deeper way, of transmitting not only information, but also knowledge. In comparing this system of “about” and “something more than about” with *Of* and *About*, it’s clear that image description models provide information but not knowledge.

The limitations of image description models are, thus, two-fold: firstly, they provide insufficient retrieval for users, do not map to museum professional practice, and perhaps are costly to enact. Secondly, they circumscribe Indigenous visual culture in language that belies its dynamic, emotional, and intergenerational nature, and the ability that Indigenous communities have to activate this knowledge. Therefore, efforts to remedy image description practices moving forward should not only work to improve its practical functionality, but should do so in a way that does not further marginalize Indigenous communities, creators, and information professionals. This is not to suggest that this is a simple way forward, but is a way forward nonetheless.

8. Further Study and Conclusion

With this “way forward” in mind, the author concludes the study by returning to the beginning, and to the research questions:

How do institutions describe and index images of Indigenous visual culture in their digital collections?

1. How does institution type, engagement with Indigenous communities or participation in repatriation initiatives, and/or size of a collection influence indexing practices?
2. How is the cataloguer’s expertise supported (i.e., guides, handbooks, etc.)? How is the user’s expertise treated (i.e., folksonomic tagging, free text description, etc.)? How is the originating community’s expertise considered (i.e., collaborative, institutional activities, etc.)?
3. Do indexing models effectively bridge the semantic gap and reflect Indigenous epistemologies? Are these issues capable of being resolved in a single model?

Given that most of the data gathered supports the main research question and the first two sub-questions, these will be discussed first. Regarding the “how” of image description, during image content analysis, the data showed that institutions largely describe images of Indigenous visual culture using *Of* terms, regardless of their specificity. Museums were more likely to use generic *Of* terms, while libraries tended toward specific *Of* terms, albeit by a narrow margin. Furthermore, libraries showed a greater degree of data standardization than museums, although museums described image subject matter in fields other than subject fields, and frequently with controlled vocabularies. Differences in institutional size were less pronounced in libraries than museums, with small museums accounting for a larger share of images with minimal indexing and missing subject matter description of any kind.

The connection between Indigenous engagement and outreach, repatriation efforts, and other activities bringing Indigenous perspectives into institutional contexts with indexing and cataloguing practices was less conclusive. However, cases 13, 18, and 20 showed a correlation between cataloguer expertise, institutional engagement, and effective language use as demonstrated in the image content analysis and survey results from cataloguers.

Although usage of domain-specific controlled vocabularies such as AAT and LCSH demonstrated the difference between library and museum professional expertise and understandings of subject matter and materiality, survey responses from library and museums respondents showed an overall ambivalence or neutrality toward institutional cataloguing handbooks. More specifically, survey responses revealed that participants were neutral to or disagreed with statements that would constitute institutional attempts to build familiarity with non-Western epistemologies or culturally sensitivity as a form of staff expertise. While there were some exceptions, overall responses varied widely and did not reveal a prevailing trend toward the development of this type of staff expertise in cataloguing guidelines.

Content analysis of institutional websites revealed the varied ways that institutions attempt to bring Indigenous expertise and perspectives into the institutional context, from repatriation initiatives to support of research centers and scholars-in-residence. However, more specific activities aimed at collaborative collection development or the involvement of local Indigenous communities in developing cataloguing policies or terminology were less prevalent both in institutional content analysis and survey results. Additionally, data from institutional content analysis and survey responses showed scant use of social tagging systems, and even some irregularity between social tagging evident from online collections and what participants reported in the survey. Keyword searching outside of controlled vocabularies was well supported overall, with the vast majority of images described with free text description either in combination with or in lieu of controlled

vocabulary terms. However, museum usage of free text and controlled vocabularies was not as consistent as libraries', and museums generally tended toward controlled vocabulary use over free text description.

Despite these conclusions, the data gathered in this study, coupled with a contextualization within the literature, shows the two-pronged problem with subject access for Indigenous visual culture. In order to consider this issue, the third research question(s) is reconsidered in light of the data gathered:

Do indexing models effectively bridge the semantic gap and reflect Indigenous epistemologies? Are these issues capable of being resolved in a single model?

The first problem identified in this question is the more universal issue of subject access for images. Highlighted in this issue is the divide that exists between libraries and museums and prevailing ideas about what an image or a digital surrogate of an object is *Of* or *About*, which includes the chasm that exists between libraries and museums regarding data standardization and interoperability of metadata for online collections. Controlled vocabularies, though they are employed between both libraries and museums, revealed these competing conceptions of description; the narrative or print-based notion of subject in libraries, or the physical or functional emphasis in museums. Whether indexing models bridge the semantic gap is therefore dependent on what is meaningful or important to understand about an image and, for cataloguers, how that is informed by professional practices and institutional context.

The second problem outlined in the question is whether image indexing reflects Indigenous epistemologies. By and large, subject metadata showed the ways in which overreliance on controlled vocabularies, and particularly LCSH, described images according to the cultural biases that are present in these lexicons. The implication of the findings regarding the differences between libraries

and museums reveal that rather than describing images according to non-Western epistemologies, image indexers are more likely to catalogue according to the perspective of their respective profession though usage of specific controlled vocabularies.

Olson (2002) introduced the concept of cataloguing techniques as means of subverting the actual authority of naming authorities and the ability of technologies to create spaces for marginalized communities to fill if they desire to do so. Howarth and Knight (2015) and Krmpotich and Somerville (2016) showed that incorporating the affective meaning of objects can be a way for institutions to incorporate Indigenous ways of knowing into indexing practice. However, whether the semantic issue of description and the marginalization of Indigenous epistemologies in cataloguing practices can be resolved into a single model is not a conclusion that can be tidily offered by the current study.

This study has demonstrated, however, that there is much work to be done to improve access to image collections of Indigenous visual culture, but it is imperative that this not be done in such a way that disenfranchises or does not acknowledge responsibility to the Indigenous peoples represented and embodied in these collections. As with other efforts to move forward and create redemptive technologies with Indigenous partners, the importance of self-determination and agency cannot be overstated. As Littletree and Metoyer aptly ask, “How can Indigenous systems of knowledge best inform Indigenous Knowledge Organization as a discipline?” (2015, p. 653), so too should Indigenous epistemologies and information professionals guide the description of visual culture in heritage institutions.

Therefore, the author offers the following strategies based on this study and the literature review for image description models for both practitioners and for researchers. These strategies are not meant to be prescriptive, but rather are meant to reflect the findings of this study and to engage additional

conversation about the future of description and subject access for collections of Indigenous visual culture:

1. Work alongside Indigenous communities and/or consult Indigenous information professionals to guide practices surrounding subject description and access.
2. Support critical cataloguing as professional practice and one that is reflexive and dynamic, and include it in institutional documentation, training in professional programs, and staff onboarding.
3. Develop redemptive technologies which support other ways of knowing, such as affective presence or folksonomic description (in consultation and partnership with marginalized communities, see number one).
4. When proposing new image description models or considering the efficacy of existing models, consider them not only from different institutional contexts, but from different community contexts and epistemologies in order to reflect the concept of subject matter in a holistic and meaningful way.

8.1 Further Study

While the current study has offered some insights into image subject access for Indigenous visual culture, it has also revealed many areas which call for further study, either because of the limitations of the study, the author's cultural experience, or important aspects that arose through conducting study but which were outside of the scope.

At the 2016 Art Libraries Society of North America conference, Hannah Marie Marshall of Cornell University gave a presentation entitled "Assessing Subject Metadata for Images" in which they compared user queries with subject metadata for two-dimensional works and three-dimensional

works, ultimately finding that users were more likely to discover three-dimensional works using non-subject terms. Other studies have focused on other media such as photographs (Laine-Hernandez & Westman, 2007; Stewart, 2010; Stewart, 2013; Lee & Neal, 2010; Collins, 1998) and graffiti art (Gottlieb, 2006) and the types of user queries and subject terms that are likely to facilitate retrieval. Because the museums surveyed were likely to have three-dimensional objects in their collections and libraries more likely to have digitized historical photographs, further study could be done to examine how this difference in media influenced existing indexing practices and could have an effect on user retrieval. Additionally, the concept of materiality and affect could also be examined in this respect; although analogue photographs are indeed three-dimensional objects, the presence of figurative representation could have an influence on the nature of “subject matter” in this context.

The next area for further study is additional insight in institutional mission and collection focus.

Although the current study examined institutional websites in their entirety, additional understanding could be gleaned by focusing specifically on the relationship between the institution’s mission and focus of their collection. For example, comparing fine arts museums to Indigenous research libraries to anthropology museums may do much to draw additional distinctions between types of cataloguer expertise, image indexing practices, and institutional practices regarding collecting and working collaboratively with Indigenous community members.

A limitation of the current study is the ability to draw conclusions about types of subject matter fields that are not subject fields or which do not consist of controlled vocabulary terms. This inhibited the author’s ability to analyze the appropriateness of terminology used in free text description or whether this field primarily described *Ofness* or *Aboutness*. Because the current study focused specifically on subject fields in order to determine the attributes of image subject access, analyzing these other fields was outside the scope; however, the author’s observation revealed that free text description in particular allowed cataloguers to name peoples and things that are not included in LCSH, for

example. Theoretically this could allow users to access images using keywords which are more accurate and culturally sensitive than some of the terms offered in controlled vocabularies, or which convey affective meaning.

Another area for future study but which was also outside the scope of this study is a comparison of metadata schemas between libraries and museums of differing sizes. As Taylor (2010) asserted, the presence of subject fields for image description is a hold-over from AACR2, and is perhaps therefore library- and print-centric, begging the question whether schemas developed by and for library professionals adhere to the inclusion of subject terms, while schemas intended for museum professionals are less likely to incorporate subject headings. Similarly, the possibility for these schemas to provide space for marginalized voices and other types of subject matter is an important consideration for application in an Indigenous cultural context.

The final, and perhaps most important, area for further study is a closer investigation into the role of decolonization initiatives in image cataloguing practices. As discussed in section 4.3, the process of coding decolonization changed and was renegotiated during the course of this study, with the author ultimately feeling that while they could identify efforts to bring Indigenous voices into institutional contexts, whether these were truly decolonizing in the Fanonian sense was firmly outside of the author's realm of judgment, and felt more appropriative than appropriate.

While the author must acknowledge that the data gathered makes a case regarding consistency between cataloguer familiarity, institutional practices, and image indexing in a few of the case studies, making the leap of judgment required to show a link between decolonization and image indexing practices left the author with a sense that she should follow her own recommendation. That is to say, that the process of decolonization and evaluating the activities and initiatives of cultural heritage institutions in this light should be enacted in partnership and under the guidance of

Indigenous communities and knowledge workers. Non-indigenous information professionals (such as the author) can and should engage in this conversation and understand their positionality in settler colonialist societies and the institutions that were developed under them, but should approach future study of decolonization within cultural heritage institutions alongside Indigenous partners and colleagues and with a willingness to experience and sit with the discomfort, embarrassment, and feelings of being implicated that Tuck and Yang (2012) suggested are part of the process of settlers coming to understand the signification of decolonization.

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Appendix A. Artstor/DPLA Content Analysis Codebook

Description	Variable Name	Values	Codes	Additional Instructions
1. Presence of subject metadata (excludes other descriptive metadata such as title, creator, medium, physical characteristics such as size)	ImageSubject	a. Subject metadata exists b. Subject metadata missing	1 99 Missing	If no subject metadata exists (ie, ImageSubject is 99), assign code 98 to all remaining variables.
2. Types of subject metadata				
2a. Generic terms which describe the forms represented in the image	OfGeneric	a. Of generic terms exist b. Of generic terms missing	1 98 N/A 99 Missing	See ImageSubject; if no subject metadata exists, use code 98
2b. Specific terms which describe the forms represented in the image	OfSpecific	a. Of specific terms exist b. Of specific terms missing	1 98 N/A 99 Missing	See ImageSubject; if no subject metadata exists, use code 98
2c. Generic terms which describe the concepts and themes represented in the image	AboutGeneric	a. About generic terms exist b. About generic terms missing	1 98 N/A 99 Missing	See ImageSubject; if no subject metadata exists, use code 98
2d. Specific terms which describe the concepts and themes represented in the image	AboutSpecific	a. About specific terms exist b. About specific terms missing	1 98 N/A 99 Missing	See ImageSubject; if no subject metadata exists, use code 98
2e. Type of subject metadata (Of/About Generic/Specific) that is most frequently applied	SubjectFrequent	a. Of Generic b. Of Specific c. About Generic d. About Specific	1 2 3 4 98 N/A 99 Missing	See ImageSubject; if no subject metadata exists, use code 98
2f. Taking into account	AppropriateLanguage	a. All	1	See

discussion in literature about appropriate and accurate language use, rank subject terms		inappropriate b. Some inappropriate, some neutral c. Some inappropriate, some appropriate d. All neutral e. Some appropriate, some neutral f. All appropriate g. Some inappropriate, some neutral, some inappropriate	2 3 4 5 6 7 98 N/A 99 Missing	ImageSubject; if no subject metadata exists, use code 98
2g. Controlled vocabulary terms or free text description	ControlledFreeText	a. All controlled vocabulary terms b. Only free text description c. Controlled terms and free text d. No subject matter description	1 2 3 99 Missing	See ImageSubject; if no subject metadata exists but there is free text description, use code 2

Appendix B. Institutional Cases Codebook

Description	Variable Name	Values	Codes	Additional Instructions
1. Size of collection	CollectionSize	[numerical value]	[numerical value]	Field required
2. Coded size of collection	CollectionSizeCode	a. Small b. Large	1 2	Field required
3. Type of institution	InstitutionType	a. Library b. Museum c. Hybrid	1 2 3	Field required
4. Institutional image repository allows for social tagging	SocialTagging	a. Social tagging enabled b. No social tagging enabled	1 99 Missing	
5. Relationships with other institutions				
5a. Website indicates relationship or affiliation with one or more universities	RelationshipUniversity	a. University b. No relationship indicated	1 99 Missing	
5b. Website indicates relationship or affiliation with one or more archives	RelationshipArchive	a. Archive b. No relationship indicated	1 99 Missing	
5c. Website indicates relationship with one or more tribal councils	RelationshipCouncil	a. Tribal Council b. No relationship indicated	1 99 Missing	
5d. Website indicates relationship or affiliation with one or more consortia	RelationshipConsortia	a. Consortia b. No relationship indicated	1 99 Missing	
5e. Any other types of	RelationshipOther	[text string]	[text string] 99 Missing	

relationships or affiliations indicated on website				
6. Indication of collaborative partnerships or decolonization initiatives	CollabDecolonization	a. Record of initiatives b. No record of initiatives	1 98 N/A 99 Missing	If no initiatives are indicated exists (ie, CollabDecolonization is 99), assign code 98 to all remaining variables
7. Types of decolonization initiatives				
7a. Repatriation programs	CollabRepatriation	a. Record of repatriation b. No record of repatriation	1 98 N/A 99 Missing	See CollabDecolonization; if decolonization initiatives are indicated, use code 98
7b. Collaborative collection development	CollabCollection	a. Record of collections b. No record of collections	1 98 N/A 99 Missing	See CollabDecolonization; if decolonization initiatives are indicated, use code 98
7c. Social commenting and tagging	CollabSocial	a. Record of social tagging b. No record of social tagging	1 98 N/A 99 Missing	See CollabDecolonization; if decolonization initiatives are indicated, use code 98
7d. Grant funding programs	CollabGrant	a. Record of grant funding b. No record of grant funding	1 98 N/A 99 Missing	See CollabDecolonization; if decolonization initiatives are indicated, use code 98
7e. [Other text]	CollabOther	[text string]	1 98 N/A 99 Missing	See CollabDecolonization; if decolonization initiatives are indicated, use code 98

Appendix C. Questionnaire Codebook

Question	Variable Name	Responses	Codes	Additional Instructions
1. How would you describe your employment status at this institution?	EmplStatus	a. Full time staff b. Part time staff c. Casual volunteer d. Regular volunteer e. Student employee	1 2 3 4 5 99 Missing	
2. How many years of experience do you have with cataloguing (professionally or on a volunteer basis)?	YrsExperience	a. No prior experience b. 0-1 years of experience c. 2-3 years of experience d. 4-5 years of experience e. 6+ years of experience	1 2 3 4 5 99 Missing	
3. How many cataloguers (including yourself) in your institution describe images?	OtherCataloguers	[numerical value]	[numerical value] 99 Missing	
4. How knowledgeable are you on the following topics?				
4a. Indigenous cultures and traditional knowledge	KnowledgeIndCult	a. Not Familiar b. Slightly Familiar c. Neutral d. Knowledgeable e. Expert	1 2 3 4 5 99 Missing	
4b. Decolonization efforts of information organizations	KnowledgeDecolonization	a. Not Familiar b. Slightly Familiar c. Neutral d. Knowledgeable e. Expert	1 2 3 4 5 99 Missing	
4c. Collaborative projects with	KnowledgeCollab	a. Not Familiar b. Slightly Familiar c. Neutral	1 2 3	

Indigenous communities		d. Knowledgeable e. Expert	4 5 99 Missing	
4d. Colonial biases in controlled vocabularies such as LCSH	KnowledgeBiases	a. Not Familiar b. Slightly Familiar c. Neutral d. Knowledgeable e. Expert	1 2 3 4 5 99 Missing	
5. Please rate the following statements regarding your institution.				
5a. My institution participates in decolonization initiatives.	InstitutionDecolonization	a. Strongly Disagree b. Disagree c. Neutral d. Agree e. Strongly Agree f. Don't know	1 2 3 4 5 6 99 Missing	
5b. My institution works with local Indigenous communities in order to derive appropriate descriptive terminology and cataloguing policies.	InstitutionIndigTerm	a. Strongly Disagree b. Disagree c. Neutral d. Agree e. Strongly Agree f. Don't know	1 2 3 4 5 6 99 Missing	
5b. My institution trains all employees in cultural biases and promotes sensitive and accurate language use.	InstitutionTraining	a. Strongly Disagree b. Disagree c. Neutral d. Agree e. Strongly Agree f. Don't know	1 2 3 4 5 6 99 Missing	
5c. My institution's participation in decolonization initiatives is affected by budgetary constraints	InstitutionBudget	a. Strongly Disagree b. Disagree c. Neutral d. Agree e. Strongly Agree f. Don't know	1 2 3 4 5 6 99 Missing	

6. True or False: My institution provides subject access to users through image indexing and description.	TFSubjectAccess	a. True b. False	1 2 99 Missing	
7. True or False: My institution uses social tagging to derive local vocabulary terms for describing images.	TFSocialTags	a. True b. False	1 2 99 Missing	
8. True or False: My institution has handbooks and training materials for preparing metadata for images.	TFHandbook	a. True b. False	1 2 99 Missing	If respondent answers b. False (ie, TF Handbook is 2), assign code 98 to all variables related to questions 9-12.
9. True or False: My institution uses terms from controlled vocabularies for describing images.	TFControlledVocab	a. True b. False	1 2 98 N/A 99 Missing	See question 8; if respondent's institution does not have a cataloguing handbook, use code 98.
10. If true, please specify which controlled vocabularies your institution uses for image description (check all that apply):				
10a. Not applicable (do not check any other boxes)	ControlledVocabNA	Checked Not Checked Not applicable	1 2 98 N/A 99 Missing	See question 8; if respondent's institution does not have a cataloguing handbook, use code 98.
10b. Library of Congress Subject Headings	ControlledVocabLCSH	Checked Not Checked Not applicable	1 2 98 N/A 99 Missing	See question 8; if respondent's institution does not have a cataloguing handbook, use code 98.

10c. Library of Congress Thesaurus of Graphic Materials	ControlledVocabTGM	Checked Not Checked Not applicable	1 2 98 N/A 99 Missing	See question 8; if respondent's institution does not have a cataloguing handbook, use code 98.
10d. Getty Art and Architecture Thesaurus	ControlledVocabAAT	Checked Not Checked Not applicable	1 2 98 N/A 99 Missing	See question 8; if respondent's institution does not have a cataloguing handbook, use code 98.
10e. Nomenclature	ControlledVocabNomen	Checked Not Checked Not applicable	1 2 98 N/A 99 Missing	See question 8; if respondent's institution does not have a cataloguing handbook, use code 98.
10f. [Other text]	ControlledVocabOther	[text string]	[text string] 98 N/A 99 Blank	See question 8; if respondent's institution does not have a cataloguing handbook, use code 98.
11. True or False: My institution has locally derived terminology that is uses for image description	TFLocalVocab	a. True b. False	1 2 98 N/A 99 Missing	See question 8; if respondent's institution does not have a cataloguing handbook, use code 98.
12. Please rate the following statements regarding your institution's training materials.				
12a. Instructions are clearly laid out and understandable.	HandbookClear	a. Strongly Disagree b. Disagree c. Neutral d. Agree e. Strongly Agree	1 2 3 4 5 98 N/A 99 Missing	See question 8; if respondent's institution does not have a cataloguing handbook, use code 98.
12b. There are	HandbookImageType	a. Strongly	1	See question 8; if

sufficient guidelines for describing specific types of images		Disagree b. Disagree c. Neutral d. Agree e. Strongly Agree	2 3 4 5 98 N/A 99 Missing	respondent's institution does not have a cataloguing handbook, use code 98.
12c. Guidelines provide additional instructions for describing culturally sensitive images	HandbookSensitiveImages	a. Strongly Disagree b. Disagree c. Neutral d. Agree e. Strongly Agree	1 2 3 4 5 98 N/A 99 Missing	See question 8; if respondent's institution does not have a cataloguing handbook, use code 98.
12d. My institution's policies for describing images enable culturally appropriate and accurate use of language.	HandbookLanguage	a. Strongly Disagree b. Disagree c. Neutral d. Agree e. Strongly Agree	1 2 3 4 5 98 N/A 99 Missing	See question 8; if respondent's institution does not have a cataloguing handbook, use code 98.
12e. Guidelines include additional information for describing material culture or images from non-Western cultures.	HandbookNonWestern	a. Strongly Disagree b. Disagree c. Neutral d. Agree e. Strongly Agree	1 2 3 4 5 98 N/A 99 Missing	See question 8; if respondent's institution does not have a cataloguing handbook, use code 98.

Appendix D. Initial Contact Email

RE: Participation in MLIS thesis questionnaire



a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA



Hello,

My name is Michele Jennings and I'm an MLIS candidate at the University of British Columbia School of Library, Archival and Information Studies. I'm contacting you because I selected your institution as a case study in my Master's thesis, and I am asking cataloguers at all of my cases to complete a brief questionnaire about their work (it should take no more than 15 minutes).

My thesis is titled "Image Description and Indigenous Cultural Heritage Collections: An Empirical Analysis", so much of my research is concerned with the description and subject access of images of Indigenous visual culture. It's important to have a sense of how policies and best practices are applied in institutions, so your responses would greatly enhance my research and help make my data sample more robust!

Your responses will be kept confidential and anonymized, and in no way shared with your employer or colleagues. The name of the institution that work for will not be reported either to further protect the privacy of your responses. I am hoping to begin analyzing data by <insert date here>, so if you won't be able to participate in that time frame, please let me know.

If you have been contacted in error or think that one of your colleagues would be a more appropriate participant, I would greatly appreciate if this message was forwarded along! Thank you for your consideration, and please do not hesitate to contact me should you have any questions or comments.

Best,

Michele Jennings

MLIS Candidate

University of British Columbia School of Library, Archival, and Information Studies

Study Title: "Image Description and Indigenous Cultural Heritage Collections: An Empirical Analysis".

Principle Investigator: Richard Arias-Hernandez ([REDACTED])

Appendix E. Questionnaire Consent Form



a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA



Thank you for selecting to participate in the Master's thesis project titled, "Image Description and Indigenous Cultural Heritage Collections: An Empirical Analysis".

The goal of this study is to investigate the way libraries and museums describe their holdings of indigenous visual culture and provide subject access to users. Image metadata from your institution has been observed and analyzed, and this questionnaire will glean additional information about the practical application of best practices, controlled vocabularies, and other cataloguing tools. The researcher hopes that this study will benefit the work that you do and the access your users have to your images by contributing to the body of knowledge regarding image description and indigenous epistemologies in cultural heritage institutions.

By answering the following questions, the researcher will be able gain insight into the way that your institution treats the description of images, and specifically images of Indigenous visual culture. You will be asked questions about your own knowledge, the training you have received by your institution, and the cataloguing practices and tools you use in your work. Your responses will be recorded and analyzed for the purposes of the researcher's Master of Library and Information Studies thesis.

All responses to the survey questions will be anonymized and be kept in a secure location and in encrypted files to ensure that they can only be accessed by researchers. This means that none of your responses will be shared with your employer. Additionally, your employer will not be named as part of the research findings, so neither you or the institution you work for will be identifiable. All of these steps have been taken to protect your confidentiality and limit any risk in your participation in this study.

By completing the questionnaire, you are consenting to participate in this research. Please note that participation in this study is optional.

If you have any questions about the study or this questionnaire, please contact Michele Jennings (telephone: [REDACTED], email: [REDACTED])

If you have any concerns or complaints about your rights as a research participant and/or your experiences while participating in this study, contact the Research Participant Complaint Line in the

UBC Office of Research Ethics at 604-822-8598 or if long distance e-mail RSIL@ors.ubc.ca or call toll free 1-877-822-8598.

Study Title: “Image Description and Indigenous Cultural Heritage Collections: An Empirical Analysis”.

Researcher: Michele Jennings ([REDACTED])

Principle Investigator: Richard Arias-Hernandez ([REDACTED])

Appendix F. Questionnaire

1. How would you describe your employment status at this institution?

- a. Full time staff _____
- b. Part time staff _____
- c. Casual volunteer _____
- d. Regular volunteer _____
- e. Student employee _____

2. How many years of experience do you have with cataloguing (professionally or on a volunteer basis)?

- a. No prior experience _____
- b. 0-1 years of experience _____
- c. 2-3 years of experience _____
- d. 4-5 years of experience _____
- e. 6+ years of experience _____

3. How many cataloguers (including yourself) in your institution describe images?

4. How knowledgeable are you on the following topics?

	Not Familiar	Slightly familiar	Neutral	Knowledgeable	Expert
4a. Indigenous cultures and traditional knowledge					
4b. Decolonization efforts of information organizations					
4c. Collaborative projects with Indigenous communities					
4d. Colonial biases in controlled vocabularies such as LCSH					

5. Please rate the following statements regarding your institution.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know
5a. My institution participates in decolonization initiatives.						
5b. My institution works with local Indigenous communities in order to derive appropriate descriptive terminology and						

cataloguing policies.						
5c. My institution trains all employees in cultural biases and promotes sensitive and accurate language use.						
5d. My institution's participation in decolonization initiatives is affected by budgetary constraints.						

6. True or False: My institution provides subject access to users through image indexing and description.

- a. True _____
- b. False _____

7. True or False: My institution uses social tagging to derive local vocabulary terms for describing images.

- a. True _____
- b. False _____

8. True or False: My institution has handbooks and training materials for preparing metadata for images.

- a. True _____
- b. False _____

***If you marked True, please answer questions 9-12.

9. True or False: My institution uses terms from controlled vocabularies for describing images.

- a. True _____
- b. False _____

10. If true, please specify which controlled vocabularies your institution uses for image description (check all that apply):

- a. Not applicable (do not check any other boxes) _____
- b. Library of Congress Subject Headings _____
- c. Library of Congress Thesaurus of Graphic Materials _____
- d. Getty Art and Architecture Thesaurus _____
- e. Nomenclature _____
- f. Other (please specify)

11. True or False: My institution has locally derived terminology that it uses for image description.

- a. True ____
- b. False ____

12. Please rate the following statements regarding your institution's training materials.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
12a. Instructions are clearly laid out and understandable.					
12b. There are sufficient guidelines for describing specific types of images.					
12c. Guidelines provide additional instructions for describing culturally sensitive images.					
12d. My institution's policies for describing images enable culturally appropriate and accurate use of language.					
12e. Guidelines include additional information for describing material culture or images from non-Western cultures.					