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Knowledge Organization in Support of an Indigenous Worldview: A Community Driven Metadata Framework for the Inuvialuit Digital Library

Abstract

Digital libraries are online platforms for organizing, sharing, and providing access to resources. Ideally, they are developed by, with, and for specific user communities. Metadata frameworks, as integral components of digital libraries, should also reflect the needs and serve the interests of those communities. In this paper I report on one aspect of my research working collaboratively with members of the Inuvialuit community in the northwestern part of Canada to explore and articulate a culturally responsive metadata framework for their digital library of cultural resources.

Introduction

Digital libraries are online platforms for organizing, sharing, and providing access to resources. They are "managed collections of information, with associated services, where the information is stored in digital formats and accessible over a network" (Arms, 2000, p. 2). Metadata frameworks are schemes for creating and implementing metadata for resources. They typically consist of the specific set or sets of metadata elements chosen, as well as guidance on how to populate those elements, including choice of vocabularies and formatting of content (Mandal, 2018; Stein & Dunham, 2018). Metadata frameworks are considered an integral part of digital libraries (NISO, 2007).

Ideally, digital libraries are developed by, with, and for specific user communities. As Borgman (1999) notes, "digital libraries are constructed, collected and organized by (and for) a community of users, and their functional capabilities support the information needs and uses of that community" (p. 234). As key elements of digital libraries, metadata frameworks should also reflect the needs and serve the interests of the communities for and by whom those libraries are designed. Many scholars and practitioners (Adler, 2016; Olson, 1999; Srinivasan, 2017) have argued for community driven and culturally responsive metadata frameworks because of the situated, contextual nature of knowledge generation and exchange. This understanding and approach is of particular relevance to Indigenous communities, who have long been particularly negatively affected by the colonial biases and racism inherent in many traditional metadata standards and frameworks (Berman, 2000; Littletree, Belarde-Lewis, Duarte, 2020; Webster & Doyle, 2008). With increasing interest in traditional knowledge, and growing recognition of the rights of Indigenous peoples to preserve, safeguard, and protect their knowledge and all its expressions (United Nations, 2007), we are witnessing a trend of Indigenous communities leveraging the capabilities of

digital technology to drive sharing of traditional knowledge and cultural heritage on their own terms (Duarte & Belarde-Lewis, 2015; Parent, 2015). In the context of Indigenous communities, metadata frameworks for digital libraries must "reflect and support context specific Indigenous ways of being and knowing and people's control over their own knowledge" (Godbold, 2009, p. 120).

Situating My Study

The Inuvialuit ("the real people") are the Indigenous people of the Western Arctic region of what is now Canada. The language of the Inuvialuit is collectively known as Inuvialuktun, and includes three languages: Kangiryuarmiutun, Sallirmiutun, and Uummarmiutun. In 1984, the Inuvialuit signed the Inuvialuit Final Agreement (IFA) with the Government of Canada, which recognized Inuvialuit ownership of their homeland, now known as the Inuvialuit Settlement Region (ISR), a region covering 91,000 square kilometres and incorporating six communities: Aklavik, Inuvik, Paulatuk, Sachs Harbour, Tuktoyaktuk, and Ulukhaktok (Inuvialuit Regional Corporation, 2017).

The "geographic remoteness [of the region] poses challenges for enabling easy access to cultural heritage resources" (Farnel, Shiri, Rathi, Cockney, Campbell, & Stobbs, 2016, p. 3) for community members. The Inuvialuit Cultural Resource Centre (ICC) was founded in 1998 with a mandate to promote and preserve the language and culture of the Inuvialuit of northern Canada (Inuvialuit Cultural Centre, 2017). To better serve the needs of the communities and fulfill its mandate, the ICC made the decision to develop an online digital library of cultural resources. The Inuvialuit Digital Library (https://inuvialuitdigitallibrary.ca/) was initially developed as part of the Digital Library North (DLN) Project, a four-year collaboration between researchers at the University of Alberta, staff at the Inuvialuit Cultural Centre, and communities within the Inuvialuit Settlement Region, and continues to grow through ongoing collaboration with the Inuvialuit.

Research Paradigms and Theoretical Approach

According to Kovach (2010), "the term paradigm when used within a research context includes a philosophical belief system or worldview and how that belief system or worldview influences a particular set of methods. A paradigm is both theory and practice (p. 141)". In order to work together with the Inuvialuit community to explore an issue of relevance to the community, and to do so in a respectful and responsive way, I situated my research within two congruent paradigms: Indigenous and participatory. An Indigenous research paradigm is grounded in Indigenous knowledge and ways of knowing, and emphasizes the importance of respectful and reciprocal relationships (Kovach, 2009; Wilson, 2008). A participatory paradigm emphasizes the contextual nature of knowledge, and focuses on equal and cooperative exchange of

community and researcher knowledge to address a real-world problem or question as determined by that community (Bergold & Thomas, 2012; Cahill, Rios-Moore, & Threatts, 2008). The coming together of these two paradigms to inform research can lead to greater social transformation when done in an equitable and respectful manner.

My research was grounded in a framework that incorporates four theories. Anti-colonial theory emphasizes the multiplicity of local Indigenous knowledges, and asserts their ability to resist colonial power structures and to go beyond dismantling colonial structures by building new and better structures based on those knowledges (Dei, 2000; Dei & Asghardazeh, 2001; Dei, Hall, & Rosenberg, 2000). The theory of fluid ontologies describes emergent and flexible knowledge structures that respond to communities' interests and needs as they change over time (Srinivasan, 2002, 2007; Srinivasan & Huang, 2005). They recognize that the most powerful interactions with digital libraries occur when the knowledge structures are harnessed to the community they are meant to serve. The sociolinguistic theory of language codes focuses on the socially constructed nature of language and the ways in which it shapes, and is shaped by, our understanding of the world around us (Bernstein, 2003; Danzig, 1995; Halliday, 1995). Digital storytelling is a technique or method that draws on narrative theory, arguing that stories are tools for empowerment as they allow communities to tell their own stories in their own way, pushing back against those stories being framed and told by others (Couldry, 2008; McWilliam, 2008; Perone, 2014). The culturally responsive metadata framework surfaced through work with the Inuvialuit community can be understood as a practical instantiation of the fusion of these theories.

Methodology

The methodological approach for my research was participatory case study. Case study is an approach that focuses on a single instance or case, examination of that case in its natural environment, and the collection of detailed data (Baxter & Jack, 2008; Dick, 2014; Stake, 1995). Participatory case study builds on that and incorporates participatory elements such as involving participants and the community in all aspects of the research. This approach allows for multiple and varied methods depending on the question or issue at hand, allowing for choices that are driven by the local context, which is particularly important when working with Indigenous communities (Bana, 2010; Reilly, 2012; Shukla & Beaudin, 2014).
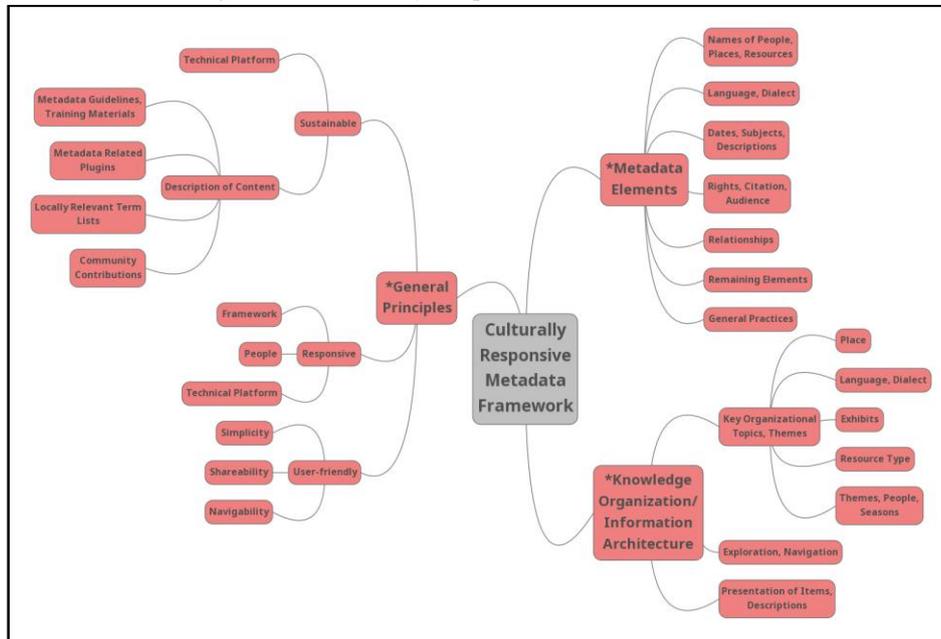
In my research I made use of a variety of methods for information gathering, including formal interviews, extended purposeful conversations, informal discussions and conversations, meetings with study collaborators and partners, presentations and demonstrations of the Digital Library, participant observation, the iterative development of the Digital Library itself, Digital Library North project data and documentation, and daily fieldnotes and trip summaries.

The analysis process began immediately and continued throughout my study. The analysis process was qualitative in nature; themes and categories were allowed to emerge from the data (Corbin & Strauss, 1990; Glaser & Strauss, 1967; Strauss & Corbin, 1990). This thematic analysis was carried out in two parallel streams. The first involved reviewing and reflecting on what I was hearing and observing, summarizing it, and sharing it with my community collaborators for feedback and input, which then informed further information gathering and analysis (Ball & Janyst, 2008; Bowen, McSeveny, Lockley, Wolstenholme, Cobb, & Dearden, 2013; Burgess, 1984; de Leeuw, Cameron, & Greenwood, 2012; Emerson, Fretz, & Shaw, 2011; Hughes, 2002; Roulston, 2010). The second stream involved formal coding of emergent themes and categories using a free data analysis software package, TAMSAnalyzer (Corbin & Strauss, 1990; Glaser & Strauss, 1967; Strauss & Corbin, 1990). These were then compared with what I was learning through the review and reflection process to bring to light gaps or discrepancies which were incorporated into what I was taking back to the community for discussion.

The Metadata Framework

Metadata frameworks are schemes for creating and implementing metadata for resources. Culturally responsive metadata frameworks, at a conceptual level, can be understood as metadata frameworks that are responsive to, and grounded in, a local cultural context, including language and ways of knowing. The culturally responsive metadata framework surfaced through collaborative research with the Inuvialuit community is pictured in Figure 1. It consists of three separate but equally important facets: General Principles, Knowledge Organization/Information Architecture, and Metadata Elements.

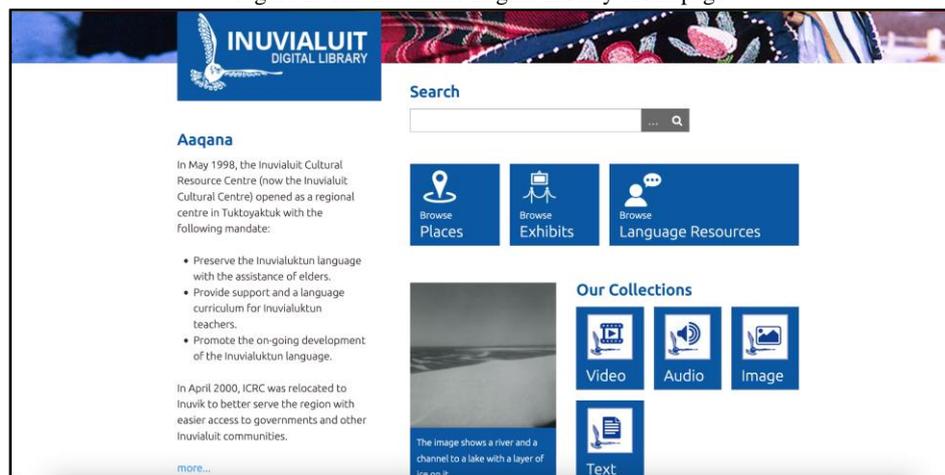Figure 1. The Culturally Responsive Metadata Framework

General Principles

General Principles include Sustainability, Responsiveness, and User-Friendliness. Sustainability refers to the ability of a digital library to continue to exist and grow over time. In the context of the metadata framework this relates specifically to the management and use of the technical platform, and the ongoing description of content. Based on the needs of the Inuvialuit community, the platform chosen had to be cost-effective (ideally open source); easily customizable; easy to install, configure, upgrade, and maintain; capable of handling layers of permission; amenable to multilingual content and interfaces. The choice of the Omeka (n.d.) platform was driven by these requirements. Its strengths include the fact that it is open source; has a large and active user and developer community; has quite robust out-of-the-box metadata support; is modular in that additional functionality is enabled through plugins, and look and feel handled through theming; and is built on common, open web technologies. These characteristics make Omeka a sustainable choice for the digital library. The other key aspect of sustainability relates to the ongoing description of content in the digital library. This needs to be something that the Cultural Centre staff can carry on over time, and so steps were taken to achieve this goal. An important contribution to these efforts is the creation of metadata guidelines and training materials. These are concise, straightforward, living documents that outline what metadata elements are to be captured, and how, and provide guidance on adding and editing items. Sustainability of

resource description is also supported through the use of two Omeka plugins, Bulk Metadata Editor (UCSC Library Digital Initiatives, 2014) and CSV Import (Roy Rosenzweig Center for History and New Media, n.d.), each of which enables effective and efficient metadata creation or revision. Sustainability of resource description has also been enabled through the development of simple custom vocabularies for use in several metadata elements; Type, Language, Dialect, Original Dialect, Places, and Subject all have a controlled list of terms that are created through community and collaborator input, and revised and updated as needed. A final aspect of sustainability with respect to resource description is reflected in the desire to have users in the community contribute to descriptions through comments, corrections, enhancements, etc. Enabling community contributions allows for efficient gathering of rich information from those who may have additional or alternative knowledge. This functionality is made possible in Omeka via the Commenting plugin (Roy Rosenzweig Center for History and New Media, 2012), which creates an easy way for users to contribute descriptive information by adding a Comments box to every item in the Digital Library.

A critical characteristic of the metadata framework identified very early on was flexibility and responsiveness as the project progressed and the needs and interests of community collaborators and members became clearer. The ability for a framework to be flexible and responsive depends not only on the structure of the framework itself, but also the approach of the individuals working with and developing it, and the technical platform in which it is manifested. Examples of this are the early creation of custom elements for Dialect and Original Dialect, as well as the renaming of elements - Creator and Contributor were combined into a single element named People, and Spatial Coverage was renamed Places. The framework was able to accommodate these without issue, meeting the interests and needs of the community and adapting to the context at hand. Responsiveness of the people working with the framework is evidenced by a shift in the use of subject vocabularies as the makeup of the project team changed. Initially there was a greater focus on use of existing controlled vocabularies supplemented by the localized vocabularies, but as the composition of the project team changed over time, with local staff and community members taking on a greater role, the balance of subject description shifted to greater use of the localized terms lists, as well as the deconstruction of pre-coordinated subject strings. The framework was able to accommodate this shift without issue, as was every member of the team. In addition to contributing to sustainability, the chosen technical platform has also contributed to the flexibility and responsiveness of the knowledge organization and resource description framework. For example, the Simple Pages plugin (Omeka Team, n.d.) allows for a more visual representation of the collections available in the digital library.

User-friendly describes something that is simple and straightforward to use. In the context of the culturally responsive metadata framework underlying the Inuvialuit Digital Library, user-friendliness was conceptualized in terms of simplicity, shareability, and navigability. Simplicity is removing unnecessary or extraneous elements to ensure an intuitive and engaging experience. An example of how this characteristic of the metadata framework is evidenced in the Digital Library is simple search. While search was indicated as a necessary means of finding and accessing the content in the Digital Library, the emphasis was on simple (Google-like) search as opposed to a complex or advanced search. The culturally responsive metadata framework was expected to both accommodate and promote sharing and connectivity between community members. An example of the characteristic of shareability that can be seen in the Digital Library is the social bookmarking/sharing functionality that was added very early on via the Social Bookmarking plugin (Omeka Team, n.d.). This plugin allows users to easily share items in the Digital Library via Facebook, Twitter, email and more, which aligns very well with the heavy use of social media within the community. Navigability is the ease with which one can traverse content within a system. Community members made it very clear from the start that wayfinding and sensemaking were critical to the success of the Digital Library. This characteristic is evidenced in several aspects of the framework as seen in the Digital Library, including the emphasis on minimal clicking. An example of this is the latest iteration of the homepage (Figure 2) which allows users to access the most important sections of the Digital Library - Places, Exhibits, and Language Resources, or to access specific types of resources (audio, video, image) with a single click.
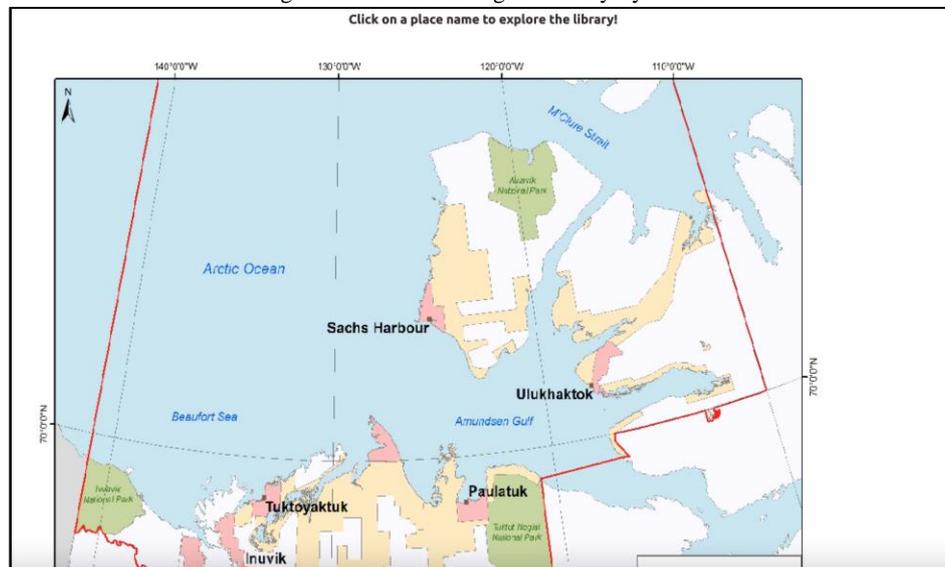
Figure 2. The Inuvialuit Digital Library Homepage

Knowledge Organization/Information Architecture

A culturally responsive metadata framework must incorporate community-based knowledge structures. In the case of the Inuvialuit community, culturally responsive knowledge organization/information architecture incorporates the key organizational topics and themes, aspects of exploration and navigation, and presentation of items and descriptions. The community identified several key topics, including place, language and dialect, resource type, curated exhibits, and themes, people and seasons. The desire to navigate and explore by place has been enacted through the use of an interactive map, where users can access all resources related to a specific place by clicking on that place name on a map of the ISR (Figure 3).
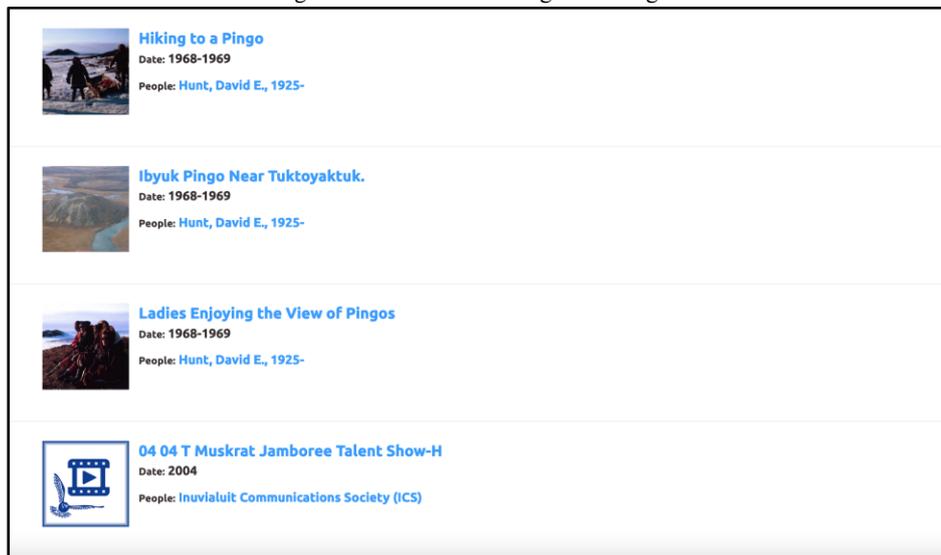
Figure 3. Browse the Digital Library by Place

Input received from collaborators and community members indicated a need for easy navigation between related items, as well as between multiple parts of the same item, within the Digital Library. Each of these contributes in its own way to a user-friendly and intuitive system. An example of easy navigation between items in the Digital Library that share certain characteristics, such as subject or type, is made possible through the Search by Metadata plugin (Roy Rosenzweig Center for History and New Media, n.d.). This plugin allows you to make any metadata element, including custom elements, into search links. Turning this functionality on for any given element means that a user viewing an item can click on a metadata value and receive a list of all other items that have that value in common.

Through input and feedback from collaborators and community members, several aspects of the display of items and their descriptions within the Digital Library have been identified as part of the culturally responsive framework. An example of this was the display of search results. The Omeka default display included the resource 'type', but this was not type as in format (audio, video, etc.) but rather type as determined by Omeka, i.e, is the resource an item or a collection. Feedback immediately indicated this was both confusing and unhelpful or irrelevant. In addition, there was very little information provided for an item to help a user determine whether or not to click through to the full item page, and there was also a great deal of unnecessary white space. To address this, we removed the 'type' information, made the thumbnails slightly larger, and added additional descriptive information, all of which contributed to a reduction in unused white space (Figure 4).

Figure 4. Search Results Page for "Pingo"

Metadata Elements

The culturally responsive metadata framework surfaced in collaboration with the Inuvialuit also incorporates an aspect commonly found in metadata frameworks, namely the identification of the metadata elements to be used in resource description, and the content that should go into those elements. However, these must be those that "resonate with culturally-specific ways of knowing about objects, ... and reflect the right cultural categories of the varied ontologies and epistemologies of multiple audiences and stakeholders" (Glass, 2015, p. 37). For the Inuvialuit this means names of people, places and resources, language and dialect, dates, subjects, and descriptions,

rights, citation, and audience, relationships, and general practices to be followed in recording those properties.

The Places element provides several examples of community specific and responsive metadata choices. The place or places associated with a resource, which could be the place from which something originated (e.g., a language booklet created by the Resource Centre in Inuvik), a place or places that a resource is about (e.g., an oral history recording discussing winter hunting locations throughout the region), or the area that a language or dialect is associated with (e.g., a story in Uummarmiutun, which is spoken in Aklavik and Inuvik), were identified as absolutely critical from the earliest days of the Digital Library project. The default (Dublin Core) element in Omeka for capturing this type of information is SpatialCoverage. Not surprisingly, this was found to be confusing and not at all intuitive. Many alternatives were suggested, including Land, Location, Place, and Places was ultimately what was chosen.

The content values for the Places element generally come from controlled lists of terms. Locations within the ISR and elsewhere within traditional Inuit territories are taken from the custom, dynamic list that was created earlier in the project and which continues to grow as new names need to be recorded. This list includes the names in English as well as all dialects of Inuvialuktun. Staff at the Cultural Centre decided that places that had officially reverted to their traditional names (e.g., Ulukhaktok, formerly Holman) would not include the westernized version. The inclusion of English names was discussed from the very beginning. Many collaborators and community members feel that it is important to include them because many individuals still know them by that name, and so not including them might disadvantage some users of the Digital Library. In addition, it was noted that colonization and the associated processes of westernization and Christianization are a part of the history of the Inuvialuit and their land, and this must be recognized and not washed away. The guidance was to keep them, but to deemphasize them, and that is what is done in resource descriptions.

The forms of names of places other than those of the ISR or other traditional Inuit locations are taken from standard sources such as the Canadian Geographic Names Database (Natural Resources Canada, n.d.). Language specialists at the Cultural Centre determined that they would like to use the Inuvialuktun names for Canada and Northwest Territories as well as the English forms and so what you find in the Digital Library is Kaanata / Kanata (Canada) and Nunaptingni (Northwest Territories).

Another unique aspect of the application of Places to resource descriptions in the Digital Library relates to the efforts to ensure Inuvialuit culture and language continue to thrive and grow into the future. General practice when describing resources is to include only those locations that are associated with an event in the lifecycle of the resource (e.g., creation or conversion), or those that represent the subject matter of the resource. However, community collaborators wanted to go outside this practice when describing language learning resources in order to help educate users about the

languages spoken in the different communities. And so, for example, a Sallirmiutun language booklet published by the Cultural Centre in Inuvik would have Inuvik included in Places, but would also include Ikaahuk / Ikaariaq (Sachs Harbour), Tuktuuyaqtuuq / Tuktuuŕaqtuuq (Tuktoyaktuk), and Paulatuuq (Paulatuk) as the language is also spoken in those communities.

Figure 5 shows the descriptive portion of a resource in the Digital Library, an audio recording of a respected elder in a long interview conducted as part of the work toward the Inuvialuit Final Agreement. Through this example we can see many aspects of the framework exemplified in a real way in the Digital Library. Sustainability can be seen here through the use of locally developed and appropriate term lists for both subjects and place names. User-friendliness is seen in the ability to navigate through this resource in its entirety via the links to subsequent parts. The item is also labelled for its type, and the metadata contains clickable links to other items with the same language or dialect, or dealing with the same subjects, places or people. Each of these aspects speaks to the key organization themes and topics as defined by community, and also enables the highly desired exploration and browsing. The categories for People and Places speak to the use of plain language labels, while combining language and dialect into a cohesive section, and placing it near the top of the display, privileges the information most important to community members. The rich use of local place names, including dialect variants and the foregrounding of the traditional names, reveals the importance to the community of reclaiming these names and ensuring future generations know them. This recording is in Sallirmiutun and was described by a member of the community who is fluent in the language. Adding a rich description as well as many subject and place terms is an aid to Inuvialuit who are learning or re-learning their language and their culture.

Figure 5. Description of an Audio Resource

People	Subject	Shamanism	Utqaluk (Baillie Island)
Gruben, Persis	Storytelling	Homes	Lady Harbour
	Travels	Elders	Iqaluktuuttiaq (Cambridge Bay)
Date	Tents	Inuit lamp	Ulukhaqtuuq / Uluksaqtuuq (Ulukhaktok)
November 1976	Illness	Fishing	Aklarvik (Aklavik)
	Whiteman	Dog teams	Tapqaq (Shingle Point)
Description	Hiking	Prediction	Qikiqtarr'uk / Qikiqtaryuk (Herschel Island)
Persis Gruben is telling her life stories of her birth place, of their travels with her parents, of when her mom got sick, of the Eastern Inuit (Qangmalit) visiting: who had different clothing and a different language and who practised shamanism, of their caribou tent frames, of when they had gifted her mom with a parka, and that some of the Eastern Inuit stayed behind. She also talks about the various families, and describes the types of homes that were made, of the Elders playing cards and storytelling, with thier Inuit lamp on, including some scary stories. She also speaks of fishing, of traveling with only dogs and of the predictions she heard of transportation with engines that were to come. Part 1. To be continued.	1926	**Language**	Paulatuuq (Paulatuk)
	Eastern Inuit (Qangmalit)	Inuvialuktun	Kaanata / Kanata (Canada)
	Visitors	**Dialect**	Iglukpak / Igluqpait (Fort McPherson)
	Various Families	Sallirmiutun	**Type**
	Trappers		Audio
	Relatives	**Places**	**Identifier**
	Caribou Hunting	Nunaptingni (Northwest Territories)	N-1992-253-0294
	Traditional Food	Inuuvik / Iñuuvik (Inuvik)	**Relation**
	Shamanism	Tuktuuyaqtuuq / Tuktuuřaqtuuq (Tuktoyaktuk)	Persis Gruben Telling Her Life Stories, Part 2
	Clothing	Pierce Point	Persis Gruben Telling Her Life Stories, Part 3
	Language	Kitigaaryuit	

Discussion

If we return to the definition of culturally responsive metadata frameworks noted earlier, namely as frameworks that are responsive to, and grounded in, a local cultural context, including language and ways of knowing, we can see that the metadata framework conceptualized by the Inuvialuit community for their digital library supports that definition. What is clear, however, is that the definition holds at the conceptual level, and that culturally responsive frameworks are only made meaningful at the local cultural level. That is, there is no single 'culturally responsive metadata framework', but rather a multitude of frameworks that each reflect the specific local context in which they are developed and applied. And this is where their true value and power lies.

In addition, this framework is much broader in scope and more holistic in nature than most metadata frameworks that we encounter. It must exhibit certain general characteristics, incorporate community-based knowledge organization, and include metadata elements that are reflective of community needs and interests. This way of understanding a metadata framework as holistic and broad is unique, and demonstrates the value and power of working with local communities to understand their specific context.

The results of any study have limitations, and those described here are no exception. Representing as it does one cultural and community context, the metadata framework cannot be assumed to be appropriate or relevant in another context, which suggests avenues for further research. Although numerous voices and multiple perspectives from within the Inuvialuit community were a part of the study, there are always others that were not, and so ensuring that new voices can be heard and contribute to the living framework is critical. Lastly, while my understanding of the emerging framework was

regularly checked against the understanding of my community collaborators, there is always a chance for misinterpretation. Continuing to work closely with the community on the framework moving forward is a means of accounting for and addressing this potential.

Conclusion

The framework that has emerged for the Inuvialuit Digital Library may act as a model for other Indigenous communities and those who work with them. It is possible that other communities may take up the framework and adjust it to suit their own context. Each and every community and context will be unique but my hope is that there will be something others can take and build on, as I have been fortunate to take from and build on the work of others.

In addition, the multifaceted framework that has surfaced as appropriate and reflective in this context contributes to a body of scholarship which has often taken an atomistic approach to this question, focusing on specific areas of organization and description such as subject headings, or viewing components of metadata description as unconnected. The ways in which the framework for the Inuvialuit Digital Library captures the holistic nature of knowledge organization and resource description, and the connectedness to technology and people, provides an alternative lens through which we can examine frameworks in other contexts.

Finally, in striving to approach this project with respect and in the spirit of reciprocity, and to carry out the work in a good way, I hope that I have been a good relation and guest in the community, and demonstrated through action how Indigenous and non-Indigenous individuals can work together respectfully and collaboratively to share knowledge and bring about positive change.

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