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Calling for an Open Access Biocultural-Knowledge Database Towards Sustained Climate Action

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Abstract:
With multiplying extreme and chronic global climate changes, it is vital that librarians and information scientists actively facilitate discoverability and open access to relevant, and sometimes underrepresented, information and knowledge systems. Traditional (TK), Local (LK), and Indigenous Knowledge (IK) include discipline-spanning holistic practices and involve reciprocity as a guiding principle of engagement. Academic articles are often inaccessible to communities who might benefit from information relevant or complementary to Living Heritage Traditions. This paper, based on a conceptual article in the Journal of Documentation, argues that library ethical and technical best practices can and should be applied towards creating a stakeholder-respectful global database of Biocultural Heritage supportive of cross-silo information sharing.
The project would support ongoing documentation and conservation of Local and Indigenous community knowledge, including "the understandings, skills and philosophies developed by societies with long histories of interaction with their natural surroundings" (UNESCO, 2017). The vision also draws upon findings of the Convention of Biological Diversity Working Group (2019), which noted TK ecosystem management in relation to cultural heritage. The database would embed stakeholder rights, recognizing that communities may not wish to participate or include knowledge elements. This essential rights feature acknowledges that memory institutions have a mixed stewardship history sometimes involving extraction, cultural insensitivity, or inadequate attribution.
Nature-integrating and relational paradigms are explored as they pertain to lifecycle and interoperable aspects of digital libraries. The paper also notes methodologies from Library and Information Science which could support sustained engagement by local and global library communities; these include multidisciplinary Open Access and citizen science as catalysts for achieving SDGs via the documentation of biocultural heritage, using library technical and subject expertise. Metadata and interoperability functions suggest key data curation roles for digital librarians.

Keywords: Biocultural Knowledge, climate change, linked data, open access, reciprocity

It is an honor and auspicious opportunity to present this paper at the Boole Library. Researchers around the world efficiently retrieve information using Boolean logic created by the namesake of this library, long ago a professor at the University of Cork. This paper flows from "A Call for the Library Community to Deploy Best Practices Toward a Database for Biocultural Knowledge Relating to Climate Change," (Lerski, 2022). The context for this proposal continues to be dynamic, and I here draw out parallels between fluid and relational TK perspectives and capabilities within digital infrastructure.

Active elements include the acceleration of climate changes as well as emerging understandings of the importance of grey literature and of the value of academic knowledge to communities who can attain information through open access. Energies embodied in sustained and community-engaged library action—and a focus on Biocultural Knowledge as "Living Heritage"—enable ongoing documentation and knowledge sharing. UNESCO's definition of Intangible Cultural Heritage informs this proposal: "The importance of intangible cultural heritage is not the cultural manifestation itself but that the wealth of knowledge and skills that is transmitted through it from one generation to the next (n.d.).

Libraries continue to operate through pandemics and disasters. Sustained by professional ethics (IFLA, 2012, 2016, 2019b) to serve communities—and involving infrastructures and conservation standards providing access—libraries present, connect, and conserve a broad range of knowledge. LK and IK systems, while known within communities, may not be available more broadly and are vulnerable through climate devastation, language attrition, population depletion, or political suppression. Ecological methods include cultural burning (Williamson, 2021), sustainable fishing, and interplanting crops (Gilbert, 2022). TK systems are also based in concepts of reciprocity and collaboration, and relationships with non-human beings—rather than in extractive approaches that have depleted resources without considering how they might be managed sustainably through human stewardship (Rozzi et al, 2020; Tribal Adaptation Menu Team, 2019; Whyte, 2013; Wildcat, 2021).

The accessibility of academic and scientific information presents a challenge to reciprocal sharing of knowledges. A study published in 2022 indicates that academic research published openly *is* used in the public arena—suggesting that libraries providing access to academic research not only serve their university constituencies but also benefit the public at large (Hicks et al.) This finding supports the emphasis of the underlying emphasis of the proposed database: to engage reciprocally with communities in relation to climate change—sharing knowledge from academics or relevant professionals and learning from and connecting Biocultural Heritage information. There are existing models for citizen social and citizen science (Kythreotis et al, 2019; NYBG, n.d.) and gathering data (Alberts et al., 2011).

The interoperable database would involve library best practices with regard to:

- Documentation, rights management, and preservation of resources such as Local and Traditional Knowledge, and relevant grey literature
- Intentional structural design towards interoperable, crosswalked, sharing and linking of academic knowledge often closed or undiscoverable in subscription infrastructures

Collections could include local languages, interviews and transcription or recording (and attendant digital lifecycle preservation strategies) to transmit valued oral traditions—and provide access to TK or IK in local communities (Chamunorwa et al, 2018; Library and

Archives Canada, 2018 and n.d.; Lund, 2019; Mhlongo, 2021; Mhlongo and Ngulube, 2018). Thus, this is a call for librarians and information scientists to work together, utilizing best practices in the realms of ethical standards and technical knowledge. Action could support academic and community access to, and utilization of, a full range of information—Living Heritage, open academic, and grey literature—relating to climate change. Cultural heritage includes, "knowledge and practices concerning nature and the universe (UNESCO, 2017).

Figure 1. Local and Traditional Knowledge recognize resilience tools such as bamboo trees for soil erosion

The Need

Beyond collecting and linking: Engaging communities

Academic journal subscriptions are largely unavailable for individuals outside of university communities (Lund, 2019). Also, inefficient or siloed search mechanisms present barriers to access or optimal identification of relevant research. Information Scientists consider how to robustly or efficiently structure metadata and systems to facilitate interoperability, including in the emerging realm of documenting Living Heritage (Artese and Gagliardi, 2019 and 2020; Hou and Wang, 2019).

Data may be indiscoverable or vulnerable to political changes or information breaches (EDGI, 2022; EDI, 2022; Weiser, 2017). Intangible Heritage and Biocultural Knowledge are inherently fragile, and susceptible to disasters (Aktürk and Lerski, 2021; Lempert, 2010a and 2010b), and pose distinct cataloging challenges (Alberts et al., 2011). Living Heritage is not readily searchable or easily shared with communities which might face similar current challenges or climate-altered future scenarios. In addition, the very nature of LK, TK, and IK may include world views that are not easily classified via existing documentation or access modalities—or are oral-tradition based.

Libraries might attend to marginalized constituents' needs by supporting and involving communities in creating materials in local languages or formats beyond print (Mhlongo and Ngulube, 2018), or by revising classification and documentation approaches to recognize that fluidity is a part of Living Heritage practices. "Indigenous librarianship applies a conception of knowledge as events or processes," writes Gosart (2021, p. 3). However, "Indigenous realities continue to be catalogued under subject headings that are irrelevant and/or

inappropriate for describing indigenous intellectual and cultural legacies (p. 5). Suggesting moving from a "units of content" perception of knowledge, Gosart describes knowledge as a process, something dynamic and relational and linked to context (p. 10).

Grey Literature

Increasingly, contemporary academic and policy information falls in the category of Grey Literature. "The adjective 'grey'…signals that this kind of literature is not well known to the public…since it is unavailable from publishers…is rarely available in libraries, and hence is difficult to access (Pavlov, 2022, p. 3). Accessibility and discoverability can contribute to information reciprocity—facilitating the public's active use of non-proprietary open literatures, links to subscription abstracts, and furthering broader dissemination of alternate or previously-indiscoverable ecological approaches.

Much of grey literature, including theses, dissertations, and government or scientific reports, is vetted—in contrast to some predatory published outputs. Its uncommercialized publication and distribution "fits in with the networked environment and its main information initiatives—open archives, open source, and open access, where the noncommercial paradigm prevails" (Pavlov, 2022, p. 13). Grey literature includes policy reports; regulatory reports; legislation; lectures; patents; case studies; conference papers, posters and proceedings; datasets; handbooks; discussion papers; feasibility studies; project deliverables; lectures; interviews; risk analyses; scientific protocols; software; statistical surveys; in-house and noncommercial jounals; and thses and dissertations (p. 10). There is potential to make these rich sources of information discoverable, accessible, and linkable (Korro Bañuelos et al., 2021; Solodovnik and Budroni, 2015). Communities wishing to document and share aspects of Traditional and Local Knowledge could thus benefit from improved information sharing between academic communities and global publics.

Roles for Libraries

Multiple areas of expertise

In addition to supporting subject specialists, librarians themselves are experts in fields ranging from preservation of analog or digital preservation, to linked data. They ae also advocates for patrons and intellectual freedom, and protectors of privacy rights. Libraries work collaboratively with internal and external stakeholders towards developing and updating standards. Ethical underpinnings, such as rights agreements, diversity-reflective collections and programming, and supportive technical pathways and protections, are fundamental to services and infrastructures. Many information organizations have created relevant systems informed by ethical standards. Among these are: DataONE (n.d.), Global Biodiversity Information Facility (2022); GO FAIR, (2022); ITEP (2019); LOCKSS (n.d.); and Mukurtu (n.d.). For instance, GO FAIR's principles would apply to a biocultural database: findable, accessible, interoperable, and reusable.
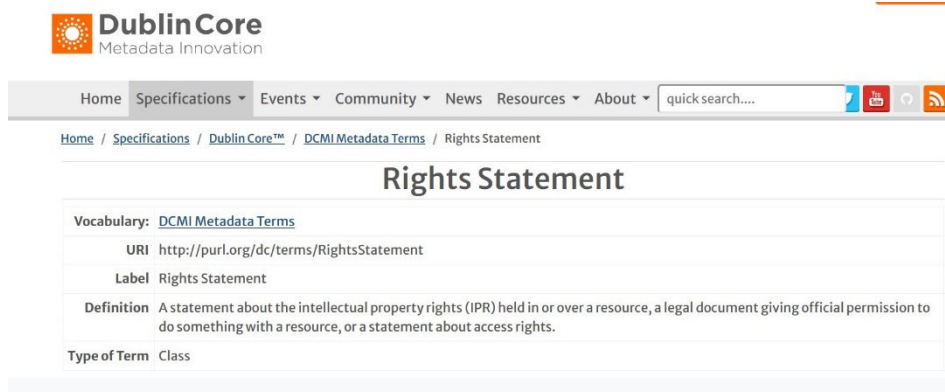
Figure 2. Intellectual Property and Access Rights are among best practices agreements and metadata aspects

Classification expertise could make orally-transmitted (Library and Archives Canada, 2018, and n.d.; Mhlongo and Ngulube, 2018), as well as informal, and grey information, more discoverable through common taxonomies and controlled vocabularies (Pavlov, 2022). Librarians have an obligation to bring relevant grey and open access material to light. Similarly, a "comprehensive classification system is essential for all countries to develop national ICH databases and to achieve feasibility and interoperability" (TK and Singh, 2022, p. 9). The crossdisciplinarity of Biocultural Heritage poses challenges regarding the division of natural and cultural heritage (Bridgewater and Rotherham, 2019), just as Said and Ichumbaki (2022) find that government distinctions between local and national, and cultural and natural sites in Tanzania prevent effective management of heritage which crosses standard classifications.

Librarians can contribute knowledge of infrastructures which support standardized and unambiguous vocabularies, archival descriptions, and leveled and secure access privileges and mechanisms for stakeholder-specified sharing preferences. Inclusion of community representatives in planning and implementation could support structures and inform subject content from inception throughout.

To integrate non-analog and relational world view materials sustainably, infrastructure and lifecycle preservation knowledge would integrate these in planning and workflows. Knowledge would be applied towards ingesting, preserving, migrating, and linking video, audio, image, as well as text documents. Metadata standards would need to be expansive, fine-grained, and able to adapt to evolving technologies and more robust discoverability and linking capabilities. Systems' security elements would be distributed, and would feature tiered access (Artese and Gagliardi, 2019 and 2020; CCSDS, 2019; Center for Research Libraries, n.d.; Chamunorwa et al., 2018; European Committee for Standardization, n.d.; Fogwill et al., 2011; Harping, 2010; Hou and Wang, 2019; Solodovnikan and Budroni, 2015; Ziku, 2020).
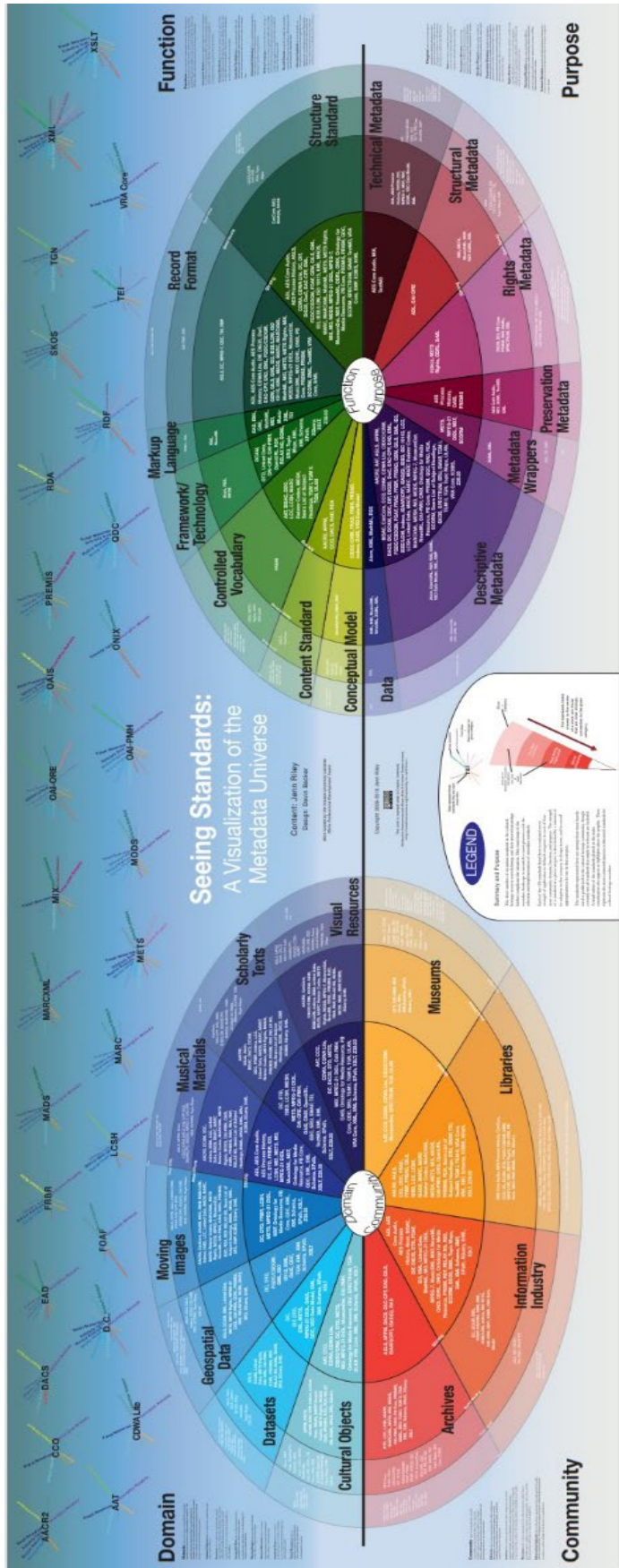
Figure 3. . Source: Courtesy of Riley and Becker, CC-By-NC—SA-3.0 US

Librarians as facilitators of ethically-informed stakeholder engagement

At the inception of planning, stakeholders' rights and the security of shared information (Climate and Traditional Knowledges Workgroup, 2014; IFLA b; Solodovnikan and Budroni, 2015) must be embedded in planning through metadata and technical implementation (IFLA, 2012; IFLA, 2016; IFLA, 2019a; Mukurtu, n.d.; Thompson, n.dl; Vanninin et al., 2020). "Bioculutural Community Protocols" are suggested by Bavekatte and Jonas towards acknowledging and protecting the "rights and responsibilities of indigenous peoples and local communities to manage and safeguard their knowledge both for their benefit, and for the planet" (Bridgewater and Rotherham, 2019, p. 301). Here there is recognition of a reciprocity—benefits *and* responsibilities within these knowledge systems.

Facilitation of knowledge-gathering and sharing would include "genuine engagement with non-academic actors," and involve stakeholders (Hanspach et al., 2019, p. 650). Technical underpinnings could support discoverability as well as safeguards (Woodley, 2008; Ziku, 2020). Library collection development and patron involvement could present "the collective wisdom of communities" (Mhlongo, 2021, p. 375).

The imperative for interoperability and relational capabilities—not just archiving

Cross-disciplinary and adaptive biocultural approaches to cultural conservation and the environment appear in academic and policy literature (Bridgewater and Rotherham, 2019; CBD, 2019, n.d.; Fernández-Llamazares and Cabeza, 2018; Hiwasaki, 2015; Lempert, 2010a and 2010b; Maldonado et al., 2013; UNESCO, 2008). However, "Biocultural approaches in sustainability science need to move…to co-producing knowledge for sustainability solutions," find the authors of a review and synthesis article considering the scientific literature on biocultural approaches to sustainability (Hanspach et al., 2020). That analysis identified a gap: "lenses rarely engage in a forward-looking perspective with action, transformation and a more dynamic and adaptive notion of biocultural approaches (p. 651). This is where libraries engaging with diverse local communities globally, and enabling interoperable and accessible platforms, can add value inclusive of concrete conservation and sustainability approaches which may also introduce alternate paradigms (Roué et al., 2017; Poole, Wildcat, 2021).

Intangible Cultural Heritage, "which may contain the secrets of sustaining life on earth, cannot be saved and transferred to future generations without human intervention" (TK and Singh, p. 21). By employing professional best standards and service orientations, librarians can collaborate with patron stakeholders, and academic and policy-oriented institutions towards documenting fragile Biocultural Heritage and exploring promising ecological approaches. Through digital infrastructures, libraries can adopt Living Heritage elements of dynamic and sustained engagement—towards creating, maintaining, and actively considering relevant knowledge systems towards addressing climate change.

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