Indigenous Knowledge Sharing in Sarawak: a System-level View and its Implications for the Cultural Heritage Sector

Rashidah Bolhassan  Jocelyn Cranefield  Dan Dorner
rashidah.bolhassan@vuw.ac.nz  jocelyn.cranefield@vuw.ac.nz  dan.dorner@vuw.ac.nz
Victoria University of Wellington, Wellington, New Zealand

Abstract
This article is written on the premise that indigenous people have their own ways of knowledge sharing and knowledge transfer. Using narrative inquiry, stories from three Sarawak-based indigenous groups were analysed to determine the nature of knowledge involved and how this related to transfer methods. The results suggest that a traditional indigenous knowledge system can be presented in a tiered model, in which the kind of knowledge in each tier determines the ways of knowledge sharing. The paper argues that cultural heritage institutions would benefit from understanding indigenous knowledge systems when they design policies and methods for the acquisition of knowledge from indigenous people.

1. Introduction

Central to the literature on traditional indigenous knowledge is the recognition that this knowledge is now accepted as pertinent to the development and well-being of indigenous people [1, 2] and as a major contributor to Western cognition of environmental sustainability[3, 4]. Interest in traditional indigenous knowledge is surging as its value becomes recognized, especially in the conservation of the environment and development concerns. For example, the ‘Green Revolution’ in biotechnology now looks for new medicines from ‘forest pharmacology’ to help in the fight against a number of illnesses, including cancer and AIDS [5-7]. The interest in acquiring medical, botanical and ecological knowledge of indigenous people requires measures that enable indigenous people to retain control over their remaining cultural, intellectual, and natural wealth for their continual sustainability and self-development. Efforts are in place to research, document, record and manage this knowledge for posterity [8].

Culture and Heritage Institutions (CHIs) (e.g. libraries, archives, museums, art galleries) may engage in the acquisition on indigenous knowledge in pursuit of such goals [9-11] but face many challenges. For example, indigenous knowledge may be deeply interwoven and embedded with traditional cultural expressions (TCEs), or knowledge containers, ranging from tangible materials, to landscapes, and to intangible forms, such as rhymes and rituals, events and performances, including methods of practicing the knowledge [12, 13].

This paper reports on how the indigenous people in Sarawak share their traditional indigenous knowledge. It is based on the findings of a larger study which aimed to understand the methods of knowledge sharing from the perspectives of the indigenous peoples of Sarawak, in order to facilitate the acquisition of traditional indigenous knowledge by CHIs in Sarawak. The paper is based on the premise that indigenous knowledge acquisition policies and processes employed by CHIs would benefit from a better understanding of the nature of the knowledge, and the methods through which this knowledge is shared within the indigenous communities themselves.

For this study, three indigenous groups in Sarawak, Malaysia, were selected as participants: the Iban, Melanau and Orang Ulu ethnic groups. These groups were selected due to their geographical locations, different languages and different traditional ways of living. The Iban occupy mainly the southern part of Sarawak, while the Melanau are mainly in the central region and the Orang Ulu mainly in the north.

This paper is structured as follows: The first section provides the rationale for the study, followed by a brief literature review about traditional indigenous knowledge and CHIs. An outline of the research methods used for the study is provided before the findings are presented. Analysis of an Iban participant’s narrative about the weaving of pua is combined with other data to illustrate how the indigenous knowledge system of these peoples comprises a system of different levels, associated with different methods of transfer/sharing. This is
conceptualised in a tiered knowledge system, in which the ways of knowledge sharing depend on the kinds and the tier of knowledge. Finally, implications of these findings, for the CHIs, the research community and the indigenous people, are discussed.

2. Rationale for the Study

Recording works and images might not be able to capture the whole context and meanings of traditional cultural expressions such as songs, rituals, arts or scientific and medical wisdom of the indigenous people. These items become knowledge objects or representations which cannot represent knowledge holistically. Eliciting the indigenous knowledge embedded in these artefacts requires the interpretations of the relevant processes, rituals, experiences and practices, from knowledge holders in indigenous communities.

This research investigates knowledge sharing within the indigenous community, a process that is poorly understood. A challenge lies in the fact that CHIs have the primary roles of preserving and providing access to knowledge, including heritage knowledge, yet indigenous people require proper handling of their TCEs due to their deep connection to the community’s spiritual beliefs, cultural identity, worldviews and indigenous laws. As TCEs are often considered sacred, not all knowledge inherent in them is appropriate to be shared or accessed outside of the indigenous community. Therefore the staff members of the CHIs must understand the unique circumstances surrounding TCEs, both from a policy perspective and as a practical issue, for handling collections of traditional works [13].

3. Literature Review

3.1 Traditional indigenous knowledge

Traditional indigenous knowledge is a culturally-centred way of knowing [4, 14, 15] where knowledge is held, embodied and practiced by the local or indigenous people[2, 7, 16, 17]. This paper uses the term ‘traditional indigenous knowledge’ to encompass knowledge embedded in TCEs that requires interpretations from knowledge holders or practitioners in the source communities on the processes, rituals, experiences and practices, with the tangible and intangible knowledge accompaniments. Tacit traditional indigenous knowledge is expressed through these traditional cultural expressions (TCEs).

Traditional indigenous knowledge is a living knowledge embedded in indigenous worldviews that humans and nature are interconnected and interdependent, linked by a symbiotic relationship [18]. To indigenous people, this knowledge originates from a spiritual base where all creation is sacred; thus the sacred is inseparable from the secular. Due to the holistic nature of this knowledge, attempts to represent it in other worldviews, such as compartmentalising or fragmenting the knowledge into separate elements, or even documenting or recording the knowledge, can lead to misinterpretation of the knowledge [4, 7].

Posey [19] postulates that traditional indigenous knowledge is knowledge expressed by the local experts who are aware of Nature’s organizing principles. It is therefore interdependent on the relationships between humans, nature, the tangible visible world and the invisible spirit world. This knowledge has been inherited from the past, handed down from generation to generation, mostly transmitted orally. Knowledge acquisition is derived from traditions encoded in daily rituals and cultural practices. Indigenous knowledge systems are rooted in cultural settings, associated with different ways of living [7, 19, 20].

It is the often the responsibility of the elders, who are the knowledge holders, to determine how the knowledge is to be shared and used, to show respect and to maintain continuous reciprocal relationships with matters of the environment that comprise the components related to the indigenous knowledge[21].

Traditional indigenous knowledge of values, self-government, social organization, managing the ecosystems, maintaining harmony in the communities, and respecting the lands is embedded in the arts, songs, poetry, ceremonial rites and rituals. Battiste and Henderson [7] argue that knowing the complex natures of natural forces and their interrelationships is an important context for indigenous knowledge, as there is no separation or categorization of knowledge in indigenous thoughts. They note that even if researchers know the name of a herbal medicine and the way it is used, achieving the actual cure requires associated ceremonies, ritual songs, chants, prayers, and relationships [7].

A bundle of complex interrelationships therefore underpins indigenous knowledge. Once a component of the knowledge is detached from this bundle of relationships, whether it is a tangible object such as the medicine or source of medicine, or ceremonial tool, or an intangible TCEs such as a song or story, this component loses its meaning and usefulness.
3.2 CHIs and indigenous knowledge

Since the implementation of the UNESCO Convention on Intangible Cultural Heritage 2003, the focus in heritage management has moved beyond the preservation of artefacts, monuments or sites, to include the living heritage embodied in people [22]. However, the Convention also advocates the Western concept of freedom of access. This does not align with traditional requirements to protect the sensitive nature of secret and sacred knowledge.

Repositories of heritage materials [23-25] may use digitization to acquire, capture, preserve and disseminate indigenous knowledge. This supports easy accessibility of traditional indigenous knowledge. While such projects may call for indigenous communities’ participation in these projects, they may not account for culturally sensitive domains of traditional indigenous knowledge.

Documentation of indigenous knowledge ranges from written materials such as manuscripts, reports, field notes, to media formats such as photographs, films, audio and video recordings, illustrations, drawings, paintings, and three-dimensional artefacts. The acquired knowledge is converted into these containers to help preserve TCEs and intangible cultural heritage [26]. These containers are deposited in cultural institutions such as museums, libraries, archives, and art galleries as repositories of knowledge.

Most CHIs emphasise acquiring and preserving tangible containers of information, rather than the living culture [27]. The need to acquire and preserve knowledge that still abounds in oral tradition is now widely acknowledged [28-30]. Kirshenblatt-Gimblet [31] suggests that in order to acquire and preserve the TCEs, it will be more meaningful if the tangibles are accompanied with the intangibles. The tacit knowledge should be “attached” to the “containers” of knowledge. The task is to sustain the whole system holistically as a living entity. The community itself is the best source of expression of its cultural origins and character, both tangible and intangible [32, 33].

Based on the above literature, it can be argued that CHIs would benefit from the development of a better understanding of traditional indigenous knowledge and the ways in which the knowledge is shared in the indigenous community’s settings.

4. Methodology

This research uses narrative inquiry as the methodology. Narrative inquiry can be used for exploratory purposes on a topic which is not widely known and where samples are expected to be small, and stories are derived from a focussed populations [34]. The narratives collected can provide a series of in-depth views of the phenomena being studied. Patton iterates that narrative inquiry is based on the foundational questions on what the story can reveal about a person and his environment, and how the narrative can be interpreted to provide an understanding of the environment and culture that created it. [35]. Narratives are stories from participants that are lived, experienced and told, as the best way of representing/understanding experience[36].

Multiple methods of data collection were used in this study: (a) conducting interviews, first person accounts of the knowledge sharing experience; (b) recording observations on encounters during the interviews (these were recorded or memoed during the experience); and (c) gathering documents, both written and visual, about the experience [37]. Multiple methods aid triangulation, which is important in achieving in-depth understanding of phenomena under study, as well as aiding in the credibility of data gathered. The use of these methods was aimed at deriving answers that were consistent, ensuring greater reliability and credibility of results study [38].

Stories were gathered through nineteen interviews, some in groups and some individual interviews, involving a total of 30 participants from the three indigenous groups. These interviews were conducted at five geographical locations where the participants were based namely, Kuching, Sibu, Mukah, Miri and Limbang. These locations were selected based on the participants’ convenience and were held at places that were able to accommodate the participants’ requests when they needed to have other knowledge holders in the interview as an “authenticity assurance”, i.e. a method of “check and balance”. They checked or confirmed with each other on what they said during the interviews.

The 30 participants for this study were selected from knowledge holders including the chieftains, those who lead rituals or indigenous ceremonies; women community leaders; medicine persons, and those who are recipients of sacred and secret knowledge. They were recruited using stratified purposive sampling, which according to Patton, provides ‘samples within samples’ [35], stratified according to the ‘status’ or identity of the person, ‘representing
the layers or groups of people relevant’ [38] to this study.

The primary researcher is a Melanau, one of the indigenous groups in Sarawak selected for this study, and an ‘indigenous’ worker in the field of information management, with experience in one of the CHIs in Sarawak. This provided an insider perspective and a sensitivity to issues discussed by the indigenous group, and relating to CHIs.

We followed a three-stage process of analysing the data. The first stage involved identifying stories about knowledge sharing. These stories were then categorised and analysed using a priori codes derived from the literature based on the research question. Finally, inductive codes were then generated from the interview data, as part of an iterative process of coding and categorising the data. As a confirmatory step, member checks were performed on emerging findings by sending emails to principal participants (those identified as representatives of the groups).

A key theme that emerged was that the indigenous people decided on the methods of knowledge sharing based on the different types of cultural knowledge that they hold. This discovery then led to the recognition that the indigenous people also determined who can share the knowledge, and to whom the knowledge can be shared based on the knowledge types. These elements provided the basis for the finding of a Tiered Knowledge System, as discussed in the next section.

5. Findings

Close analysis of the data revealed different kinds of knowledge as summarised in Table 1 below.

<table>
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<tr>
<th>Tiers of Knowledge</th>
<th>Characteristic</th>
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<tr>
<td>Tier 3 Sacred knowledge</td>
<td>Sacred requirements; knowledge held by a few knowledge holders; sought or bestowed upon; knowledge keepers/holders vs. knowledge owners.</td>
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<tr>
<td>Tier 2 Ceremonial and ritual knowledge</td>
<td>Deeper knowledge; sharing and transfer of knowledge pro-active; active participation and practice</td>
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<tr>
<td>Tier 1 Base knowledge</td>
<td>Shared foundation; communal sharing; accessible to all</td>
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Tier 1, the base knowledge, was found to be shared passively, i.e. where the type of knowledge is usable for everyone, and serves as the foundation for a person if she or he decides to take the knowledge further into Tier 2. This knowledge was easily accessible to the community, and manifested in communal events.

Tier 2 comprised knowledge that was accessible to those wanting to be an understudy of a master knowledge holder. This deeper level of knowledge was shared and transferred by the master knowledge holder to his/her understudy via tutelage and observation of hands on practice of the knowledge holder. In order to gain this knowledge, knowledge seekers had to be proactive in seeking it from the knowledge holder. Tier 2 involved active knowledge sharing and transfer.

Tier 3 knowledge was sacrosanct; kept by very few knowledge holders. Sharing of knowledge in this tier was highly selective, and involved either (a) transferring the knowledge to the person who sought the knowledge, (b) transferring the knowledge to a chosen recipient, or (c) receiving it as a result of dreams or spiritual visions. At this level, recipients did not necessarily actively seek for the knowledge. They could have knowledge is ‘bestowed’ upon them. Certain requirements needed to be fulfilled in order to share and transfer knowledge in this tier.

The three kinds of knowledge were grouped into three tiers of knowledge, based on three main ways of sharing knowledge (passive, active, selective) to develop a framework for a tiered knowledge system illustrated in Figure 1 below. The diagram illustrates how the number of knowledge holders reduces as the tier of knowledge increases. However, the depth of knowledge also increases as the tier level increases.

Figure 1 Tiers of indigenous knowledge

To illustrate this system and how knowledge at each tier is shared and transferred, the next section recounts a story about pua a textile woven by Iban
women that is iconic in the Iban culture. In presenting this story, we demonstrate how the different tiers of knowledge are contained in (a) the TCEs associated in the making of the *pua*, (b) the practical methods of weaving the *pua*, (c) the methods of knowledge sharing and transfer at each stage of the *pua* weaving process, and (d) knowledge about the traditional uses of *pua*.

**The Story of Pua**

This story is based on an interview with Margaret, an accomplished Iban *pua* weaver, who also worked with a team that organised awareness programs on the revival of this ancient art of weaving.

The woven cloth *Pua kumbu*, according to Margaret, literally means a blanket to cover or wrap one’s body. Chieffains or community leaders use this cloth during many community functions in the Iban society, for several purposes: to mark one’s life journey from birth to death; to receive a new baby in the longhouse; during weddings and other Iban ceremonial *gawai* in the longhouse (e.g., *Gawai Antu*, a festival in remembrance of those who have died); and to cover the body of a deceased.

Margaret explained that the making of the *pua* to her understudies. Margaret explained that in the past, warriors used *pua* woven with war-related themes or icons, such as trophy heads or crocodile motifs. Sometimes a design with a space in the middle of the *pua* indicated that the spirits were being kept inside the *pua*. In the past, it was believed that *pua* which had icons that carry powerful and/or spiritual meanings in the *pua* designs were used as a shield, to protect the owner or user from spirits of the underworld, curses or charms. The icons used in the *pua* depict the purpose of the *pua*.

Margaret’s story illustrates how the *pua*, as a TCE, relates to the three tiers of knowledge: The first tier or base knowledge can be seen in the chieffains’ use of *pua* during communal celebrations, which provides a public sharing of the significance of the *pua* in Iban culture. Knowledge of when, where and how the *pua* is to be used in specific Iban rituals exemplifies knowledge at the second tier. The third tier of knowledge, contained in the *pua* itself, is the embedded in the icons, which can symbolise potent or powerful, almost spirituous meanings. According to Margaret, only the weaver can explain the sacred meanings of the icons... Thus, traditional indigenous knowledge of the *pua* exists (i) in the usage of the *pua*, (ii) in the icons used in the design of the *pua*, and (iii) in the tacit interpretations in the minds of the weaver as the knowledge holder.

The following section outlines in detail the processes of making a *pua*, as described by Margaret. These processes still follows strong beliefs and involve the need to observe many taboos, from the making of ritual offerings when starting the weaving project, to deciding on the icons to be used in the design.

**The miring before the commencement of weaving.** Margaret explained that the making of the *pua* has to start with a *miring* or offering. *Miring* involves requesting divine or spiritual assistance with the process of producing a *pua*, regardless of the size of the weaving project. These offerings usually consist of *tuak* or rice wine, betel nuts and *sireh* or betel leaves. Chants are recited to ask assistance from the gods, to ensure the smooth flow of the process of weaving.

**The ngar and the dyeing process of the yarns.** Another ritual has to be conducted before the dyeing of the yarn: the *ngar* ritual, which has to be led by master dyers. The purpose of the *ngar* is to ensure that the clean cotton yarns can ‘accept’ the dye, made from the roots of the *engkudu* plants that give the red colour that is quintessentially the identity of a *pua*.

Margaret stressed that it was believed that cotton yarns could not ‘accept’ the dye of the *engkudu* plant if the *ngar* ritual was not carried out. She explained that in the past, the *ngar* ritual was “like going to war” as the ritual is complicated with many taboos; things you cannot do and say during the process.

Knowledge sharing processes occur during the carrying out of both these rituals, but are confined to the women involved in the making of the *pua*. The *miring* and the *ngar* can be seen as combining the three tiers of knowledge. The rituals are conducted by the women weavers and watched by apprentices who acquire the base knowledge. Other women who have achieved a certain level of mastery in the making of the *pua* carry out the ritual process, which comprises the second tier of knowledge. However, certain parts of the rituals must be carried out only by the priestess. These special rituals form the third tier of knowledge. All the women taking part in these activities contributed to the sharing and transfer of knowledge, from the master dyers to the other weavers, from the priestess to her understudies.

**The designing stage: choosing the icons.** Margaret explained that the icons or motifs to be used in the design of a *pua* had to be carefully chosen, as certain

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1 *Engkudu* or *mengkudu* A plant also commonly known as Noni or *Morinda citrifolia* (L)
sacred requirements needed to be observed. For example, the designs of the pua that were kept in a family, could only be used by others outside the family if a pengeras or token is given to the family to fulfil a sacred requirement. In the past, this token was in the form of another artefact. The kind of artefact required depended on the level of the icon/design. However, money is now used to replace the tokens as some types of tokens cannot be readily found now.

According to Margaret, the master weaver shares knowledge with the apprentice weaver about the icons and patterns that can be used by a weaver at that level. The apprentice weaver will also be informed of the designs she is allowed to copy. A beginner usually begins with simple designs, and is not able to use designs of human figures until she has woven a few pua. It is mali or taboo for an apprentice weaver to use human figures. If the master weaver did not provide guidance on the designs to be used, she (the master weaver) would get alah ayu, becoming sick, or even dying. This is where the belief of spiritual elements in the process of weaving pua could do detrimental things to the master weaver or the weaver if the sacred requirement is not being adhered to properly.

**Weaving.** In the process of weaving, it is imperative for the master weaver to share with an apprentice the spiritual requirements. Margaret stressed that it is essential for a weaver, regardless of their level of expertise, to use another piece of cloth to cover the designs that she has put on the loom during the designing stage. She needs to advise the apprentice weaver on the kind of design that could be used as an ‘accompaniment’ to make the ‘spirit’ of the design happy. If the design uses human figures, it is considered taboo for an apprentice weaver to mention the parts of the human body. The master weaver has to ensure her apprentice does not mention the designs to anyone at any point during the weaving process. It is feared that speaking of or mentioning the motif or design could invoke the spirit of the design to do harmful things to the weaver. This is the sacred part of the traditional pua design.

An accomplished weaver is not supposed to tell people of the elements used in her designs. Someone else has to explain on her behalf. This provides an interesting example of how one person makes verbally explicit the tacit knowledge of another. The knowledge in the designs is implicit in the visual representations. The decision on the types of icons that could be used was based on the number of pua an apprentice had woven. Giving a pengeras or a token to the originator of the icon design, is required to honour the intellectual property and origins of the motif.

When an apprentice weaver commences design with a sacred icon, the master weaver has to start the work. Only then can the apprentice continue, with the master weaver continuing to help, recounting the meanings of the images/designs, and explaining taboos to do with the icons and making processes. This ‘hand-holding’ between the master weaver, the knowledge holder, and the apprentice weaver, the knowledge receiver, continues until the pua is complete. The tacit knowing of the master weaver has been shared during this ‘hand-holding’ process.

This story shows that traditional indigenous knowledge on the processes and the meanings of the designs is ingrained deeply in the master weaver as she repeats the meanings of the sacred icons or designs to other apprentice weavers. These practices, by ingraining the knowledge deeper in the minds of both the master weaver and her apprentices, helps preserve traditional knowledge. In summary, the pua, as a TCE, and the process of making and using it, can be seen to contain knowledge which is multidimensional in nature. This is illustrated in the diagram below, showing how the tiers of knowledge are embedded in pua, and in a network of carriers of aspects of its knowledge: the people, the ceremonies and rituals of the use and making of pua, and the icons and designs of the pua. As the type of knowledge progresses to higher tiers, fewer people hold the knowledge.

![Figure 2 Multidimensional knowledge embedded in a pua, an Iban TCE.](image-url)
6. Discussion

This section discusses in more depth the tiers of knowledge, with examples from all three indigenous groups. It also briefly explores synergies between the findings of this study and Snowden’s third generation knowledge management [39, 40]

Tier 1: Base knowledge

This first tier of indigenous knowledge is shared publicly within the indigenous communities. According to the participants, this knowledge is accessible to all, and there is no need to ask for it. This knowledge is imparted during communal events in which everyone can observe, listen or partake. It is the duty of elders to impart essential life skills knowledge to family and community members. The intangible TCEs used during these events include music, dance and chants, while the material TCEs include gongs and the paraphernalia appropriate for the events. When communal participation is the norm in the carrying out of the processes for the events, this is the time for the sharing and transfer of knowledge to occur. It is during socialization amongst the community members when this type of knowledge is made accessible to all, for people to observe, and for participation of those who are willing. This first tier of knowledge provides the base knowledge to enable a person who is interested to pursue this knowledge further.

Communal events described by the participants include the rites for the passage of life, such as birth ceremonies, betrothal, funerals, to ceremonies such as the commencement of building a house. These events also include community celebrations such as those connected to beliefs and legends and which usually require the total involvement of community members, young and old, from across the community’s structure.

The first tier of knowledge category also includes ‘unspoken’ knowledge associated with TCEs, such as identity or status indicators. For example, the Orang Ulu group use hornbill feathers in men’s ceremonial hats to indicate the different strata of people within their community. The significance of the feathers as a TCE is as an identity indicator: the number of feathers carries the intrinsic knowledge of the status, authority and identity of the person who wears them.

Observing these events provides the community with prior shared knowledge that is common to everyone, and which improves with repeated exposure. Ingraining such knowledge in the minds of the community requires a conscious effort on the part of the community members. This is shared responsibility.

Sharing of base knowledge also provides knowledge of ‘who knows what’ and ‘who knows who’ in the community. It is essential for those interested in the second tier of knowledge to know these points of reference.

Tier 2: Ceremonial and ritual knowledge

Once a person has a grasp of the base knowledge, if he or she chooses to pursue acquiring the knowledge further from the knowledge holder, she or he will have to undergo a period of apprenticeship under the guidance of the knowledge holder.

An example of the second tier of knowledge is of the sharing and transfer of knowledge through intangible TCEs, in the rich oral traditions of the Iban. Susil, an Iban, explained that oral traditions are used in different circumstances in Iban communities. For example, sabaq2 or dirges are chanted for the dead during funerals or during Gawai Antu, an annual remembrance ceremony. The timang3, sampik and embiao4 are solely recited by men, while pantun5, sabaq, ensera6 can be recited by both male and female, and sabaq is commonly done by women.

These oral traditions are common knowledge to the Iban community. To elevate one’s knowledge of these oral traditions to Tier 2, one has to learn these oral traditions under the respective knowledge holders: There are different knowledge holders for different oral traditions. During the transfer of knowledge about these TCEs, issues such as who can perform them or which gender can render recitations are made known.

The tacit nature of this second tier of knowledge expressed in such TCEs, i.e. songs or other oral traditions, is usually transmitted orally. Practising under the tutelage of the knowledge holder is a form of knowledge transfer. The ways of chanting or singing verses can also differ between the lemamhang and bards. To help the bards remember, they sometimes used a mnemonic device to master long poems, called papan turai, where symbols and icons used in the chants were carved onto a wooden board. These writing boards were a form of TCEs. However, the symbols or writings on the papan turai would not be understood by, or useful to, a bard in another community in a different location.

The story above illustrates that traditional indigenous knowledge is distributed amongst different members in the circle of practitioners, in

2 Ritual dirges or chants;
3 Invocatory chants
4 Ceremonial oratories or traditional prayers
5 Traditional praise songs
6 Legend or poetic epics
This example, the group of bards; and part of the knowledge is contained in the TCE, i.e. the *papan turai*. The transfer of such complex and compartmentalised knowledge is only possible by active participation between the knowledge holder and the knowledge seeker.

Similarly, a Melanau informant discussed the example of traditional indigenous knowledge of the blacksmith in the making of a *parang* or machete, a common tangible TCE amongst the indigenous groups. One can learn making a *parang* by becoming an apprentice, understudying and observing the knowledge holder. Repetitively following the steps of the expert in ways of making the *parang* is a form of knowledge transfer. The process of knowledge transfer, according to this informant, is ‘straightforward’, as there is no need to beckon spiritual or divine help or assistance, no rituals that need to be observed, and the learning is not confined by age, gender, time or social status, or a need to be the ‘chosen’ one in the community.

**Tier 3: Sacred knowledge**

The final tier of knowledge requires fulfilling requirements which almost always have a ‘third’ dimension, i.e. the involvement of spiritual or ‘divine’ intervention. Certain types of knowledge within this category need to be sought or requested from the knowledge holder. Another type of knowledge is bestowed upon a recipient who is chosen by the knowledge holder. Some knowledge is not to be shared at all. These types of knowledge form the top tier of indigenous knowledge, and are not accessible to all.

There are certain sacred requirements needed in carrying out the processes of using the knowledge. As such, these requirements also need to be fulfilled in the sharing or transfer of such knowledge. For this level of knowledge, one can ask to acquire this knowledge from the knowledge holder, or one is chosen by the knowledge holder to be the person to pass on the knowledge to. There are also situations where knowledge seekers of these kinds of knowledge were turned away or not ‘granted’ the knowledge. This could be due to several factors such as age, gender, suitability, or even genealogy. According to the informants, there are types of knowledge in this tier where it is not the decision of the knowledge holder to identify or decide on the recipient. It would be the decision of the ‘spiritual owner’ of the knowledge, relaying the message to the knowledge holder through dreams or visions. In this example, the knowledge holder is just the ‘knowledge keeper’.

This final tier of indigenous knowledge is limited to a special kinship or circle of the community, confined to a small group of knowledge holders. This limitation has an impact on the sharing and transfer of such knowledge, as at times, it is not just between knowledge holder and knowledge receiver, but the role of an additional element in the knowledge process, that of ‘divine’ or ‘spiritual’ intervention.

**The importance of shared context**

The challenges of sharing knowledge that is deeply embedded in community context has been previously recognised in the organisational literature by Snowden [39, 40]. Arguing against the dominant idea that the primary objective of knowledge management should be the codification of tacit knowledge, Snowden’s third generation theory of knowledge management argues for the creation of shared context and the use of narratives as a knowledge repository that permits discourse across time and space. The findings of this study can be seen as supporting Snowden’s arguments that (a) the content of knowledge containers needs to be connected with the knowledge holders to be understood, and (b) it is interactivity between humans that generates and creates collective knowledge.

**7. Summary, implications and conclusion**

In this study, the indigenous knowledge of three Sarawak peoples was found to be distributed and multidimensional. Different kinds and levels of traditional indigenous knowledge determined how and in what contexts the knowledge was transferred. We have conceptualised this as a three-tiered system of inter-related knowledge dimensions. Each tier has distinct properties and is linked with particular methods of knowledge transfer, arising from cultural understandings of the nature, value, and scarcity of knowledge. The whole is like an ecosystem in which every part of the knowledge, the knowledge holders and the receivers, the TCEs that accompany the knowledge, and the network of knowledge holders in the community play important roles.

This framework can be seen as having several potential implications for CHIs that are charged with acquiring knowledge to complement TCEs. First and foremost, the tiered system has the potential to enable CHIs to approach the governance and management of knowledge acquisition with a structured view that aligns with the knowledge views of their key heritage and preservation stakeholders: Rather than focus on the diversity and complexity of indigenous
knowledge linked with TCEs per se (as is evident in the multiple rituals associated with pua weaving), the model provides opportunities to shift to a higher level view that allows prioritisation and resource allocation of projects, and the application of differential approaches to knowledge management. Asking questions such as, how should Tier 1 level be managed? Where and by whom? may lead to a shared governance model. For example, CHIs may see their role as supporting elders in creating and managing distributed knowledge repositories, in cases where knowledge is scarce, unavailable, and linked with spiritual risks. The framework could also help CHIs to plan for managing the knowledge acquisition over time, for example by engaging with appropriate peoples to follow the season of rituals that exposes tier 1 knowledge associated with a variety of TCEs.

In order to align with the indigenous Tiers of Knowledge and the ways of sharing, CHIs’ processes and methods of acquiring knowledge from the indigenous knowledge holder should depend on the kinds of knowledge on the respective tiers. Understanding the tiers of knowledge within a TCE can help CHIs to decide on practical questions on how the knowledge is to be acquired, and up to what level of the tier of knowledge should the CHI acquire. If the knowledge has sacred accompaniments, how will the acquired TCEs be managed?

This will have further implications on the post-acquisition management of the acquired traditional indigenous knowledge. This includes aspects of categorization and classification, methods of ‘packaging’ knowledge, and (in material culture-focussed CHIs such as a museums and art galleries), aspects of care: One of the informants spoke of the need to call traditional experts for conducting the rituals before commencing maintenance on a burial post exhibited at the CHI he worked at.

While some CHIs acquire traditional indigenous knowledge for preservation purposes, others disseminate knowledge, packaging it in catalogues, or making the knowledge available and accessible online. The policy decisions of the CHIs on the extent of accessibility on traditional indigenous knowledge in such instances should take into account sacred tenets of traditional indigenous knowledge. This is in line with one of Battiste and Henderson’s [7] structures for the indigenous ways of knowing, that sacred traditions and persons who know these traditions are responsible for teaching ‘moral and ethics’ to practitioners who are then given responsibility for this specialised knowledge and its dissemination.

The three-tier model therefore provides an opportunity for CHIs to re-examine their knowledge acquisition policies at a structural level that has economy, allows high level decision-making, and aligns with the world views of indigenous peoples.

The study findings also have potential implications for the indigenous peoples. As knowledge holders, they will continue to be sought by the CHIs to collaborate on the preservation of their knowledge. Sharing the model with the indigenous peoples may make them aware of the wider role of their knowledge, and provide insights into the challenges CHIs face in their preservation efforts. This awareness may lead to further understanding of their knowledge as a resource, and, of the need for protection of their intellectual property rights.

For researchers, there is potential to explore whether this model has further applicability outside of the communities studied, and to further explore the synergies with Snowden’s work on third generation knowledge management.

The focus of the present study has been on three main indigenous groups in Sarawak. There are more than 20 other indigenous groups in Sarawak, and future studies can expand into these other groups. However, the main contribution of this study is the potential usefulness of the framework for other researchers in studying indigenous knowledge. Understanding the model of the Tiered Knowledge System of indigenous knowledge has the potential for other researchers working on indigenous knowledge for applied sciences, for example, uses of plants, knowledge in indigenous environmental conservation, indigenous identity and personality development, and inter-indigenous groups cross-cultural studies, to name a few. This study adds to prior studies by generating new understanding about the ways of sharing indigenous knowledge [6, 41, 42], the importance of knowledge context and its inseparability from the knowledge holder. However, this three-tiered model adds to current views that the types of indigenous knowledge (sacred, ceremonial, base) are being recognised by the three main ways of knowledge sharing (passive, active and selective). The tiered knowledge system highlights the progressive restricted accessibility of knowledge at higher levels. In a sense, this would be a challenge to knowledge management, where sharing of knowledge is a form of knowledge preservation. This also challenges the notion of wider accessibility to knowledge as advocated by the UNESCO Convention of 2003[12].
5. References


