(re)collections:

developing a metadata application profile for the Quinkan Culture Matchbox

Thesis submitted by

Sophie LISSONNET

(M. Bus. I. T (Information Management), RMIT University, 2002)

in July 2004

for the degree of Masters of Indigenous Studies

in the School of Indigenous Australian Studies

James Cook University

APPROVALS

ACKNOWLEDGEMENTS

The researcher wishes to thank the residents of Laura and surrounds for their support, hospitality and for sharing their knowledge and affection for Quinkan Country.

Team mates, staff and friends at James Cook University (SIAS) and La Trobe University (CS & CE) are also acknowledged with gratitude. Thanks must be extended to the institutions that have provided advice and support.

This research was supported by an ARC Linkage Grant (C00107679) and an Australian Postgraduate Award (Industry).

CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

The Quinkan community has chosen to use online technology to repatriate some of the widely dispersed content that forms part of its culture. Metadata about resources can be aggregated without the need to aggregate resources. Dublin Core (qualified), with its focus of resource discovery, has been chosen as one of the building blocks of the 'virtual cultural institution', the Quinkan Matchbox. Some of the resources to be repatriated are not yet identified. Others have been described according to a great variety of guidelines or to suit a variety of purposes. This research takes advantage of the modularity and extensibility of the Dublin Core architecture to develop a unifying metadata application profile (MAP) to describe the content of the Quinkan Matchbox. The profile must support the importation of records produced by a variety of intellectual communities with tolerable levels of loss. It must also reflect the Quinkan community's view of cultural heritage, possibly through the addition of local usage elements, element refinements and vocabularies.

The building of the Quinkan Matchbox is informed by the differing Western and Indigenous views on heritage. It places the preservation of Indigenous heritage through online networks and multi-media technology in the context of cultural globalisation, control over intellectual property and traditional modes of transmission of cultural knowledge. The design of a composite profile follows the Aggregation, Rationalisation, Harmonisation (ARH) framework (Currie et al., 2002). Following a review of a number of metadata standards used in the cultural heritage community, the draft application profile is assembled by aggregating, then rationalising metadata elements from Dublin Core with elements from other metadata element sets. Cataloguing of existing resources

is used to test the MAP's ability to accommodate the cataloguing practices of organisations holdings records of interest to the Quinkan community and to adjust the design of the profile in order to minimise loss or distortion. It is suggested that specialised, more granular MAPs could be developed to support specific purposes. The lack of insider's knowledge of the culture profiled makes it difficult to evaluate whether the local refinements and vocabularies introduced reflects the contours and relief of the Quinkan cultural landscape. In the end, the MAP is to be regarded as one component of a large assembly of technical infrastructure, legal agreements and human resources that still remain to be built, validated and staffed. The relevance and usefulness of the Quinkan Matchbox as a cultural tool will be fully realised if it can be woven into cultural practices and assist the community in affirming its sense of identity.

USAGE AND SPELLING

Rock Art: the usage of upper case follows the lead of N. Cole, who has studied extensively the Rock Art of Quinkan Country.

Schemata: the plural form of the term ‘schema’ is ‘schemata’. It has been adopted throughout this thesis, with the exception of direct quotes using the term ‘schemas’ that have been kept unchanged.

The Web: The complete set of documents residing on all Internet servers that use the HTTP protocol, accessible to users via a simple point-and-click system[1].

[1] The American Heritage Dictionary of the English Language (2000), Fourth Edition. Online: http://www.bartleby.com/61

GLOSSARY

Each of the following resources contain a glossary section of metadata-related terms that can be consulted online:

Arms, W. Y. (2000). *Digital libraries*, 2005, from http://www.cs.cornell.edu/wya/DigLib/MS1999/glossary.html

Baca, M., ed. (2000). *Introduction to metadata: glossary. Version 2.0,* 2005, from http://www.getty.edu/research/conducting_research/standards/intrometadata/glossary.html

Duval, E., Hodgins, W., Sutton, S., & Weibel, S. L. (2002). *Metadata principles and practicalities*, 2003, from http://www.dlib.org/dlib/april02/weibel/04weibel.html

Heery, R., & Day, M. (2002). *Application profiles: interoperable friend or foe?,* 2005, from http://www.europeanlibrary.org/doc/tel_milconf_presentation_day.doc

Lanzi, E. (1998, 2000). *Introduction to vocabularies: enhancing access to cultural heritage information*, 2005, from http://www.getty.edu/research/institute/vocabulary/introvocabs/

Powell, A., Nilsson, M., Naeve, A. & Johnston, P. (2004). *DCMI Abstract Model*, 2005, from http://www.ukoln.ac.uk/metadata/dcmi/abstract-model/

Woodley, M. S., Clement, G. & Winn, P. (2005). *DCMI Glossary*, 2005, from http://dublincore.org/documents/usageguide/glossary.shtml

"In England, a crassly Philistine Utilitarianism was rapidly becoming the dominant ideology of the industrial middle class, fetishing fact, reducing human relations to market exchanges, and dismissing art as unprofitable ornamentation."
Terry Eagleton, 1983, *Literary theory: an introduction*, p. 19.

"Twentieth-century identities no longer presuppose continuous cultures or traditions. Everywhere individuals and groups improvise local performances from (re)collected pasts, drawing on foreign media, symbols and languages."
James Clifford, 1988, *The predicament of culture: twentieth-century ethnography, literature, and art*, p. 14.

"Ce que j'apprend ici sans toi vaut-il ce que j'oublie de nous?"[2]
Abderrahmane Sissako, 1998, *La vie sur terre* (Life on earth)[videorecording].

[2] Is what I learn away from you worth what I forget about us?

(RE)COLLECTIONS: DEVELOPING A METADATA APPLICATION PROFILE FOR THE QUINKAN CULTURE MATCHBOX

Introduction

"Though we speak of sharing our memories with others, we could no more share a memory than we could share a pain."
B. S. Benjamin (quoted in D. Lowenthal, 1985, *The past is a foreign country*, p. 195)

CHAPTER 1: PROFILING THE UNKNOWN

The Quinkan community (described later) is interested in using online technology to repatriate some of the widely dispersed content that forms part of the Quinkan culture and build a 'virtual institution' for cultural management and preservation (hereafter Quinkan Matchbox). Buildings and systems involve complex technical and design choices, and very often these choices are informed by the nature of the content they are intended to house or the usage to which they will be put. In the case of the Quinkan culture, the future content of the proposed virtual cultural institution is not defined, or (co)-located, or bounded. The users are not known. The nature of their future interaction with Quinkan Matchbox is not easily predicted. For the researcher, this presents an unusual challenge. Is it possible to profile unbounded collections and meet the information needs of various undefined users? Is it possible to achieve this in a way that is culturally appropriate for an Indigenous community, while at the same time maintaining a base standard for information exchange and inter-operability?

The Quinkan community of Tropical North Queensland has a history of displacement and cultural disruption. It is the research project's assumption that a possible avenue for strengthening a community's bond with the past and securing its future cultural survival is to regain control over the management and use of its cultural property. In the case of the Quinkan community, some of this cultural property consists of an estimated 100,000 Rock Art paintings scattered throughout Quinkan country, some is held in variety of cultural and government institutions, such as museums, libraries and archives. More intangible cultural property is embedded in local knowledge and human experience. Repatriation and preservation of cultural content (artefacts, cultural and intellectual property) is a vital part of strengthening or

revitalising local Indigenous communities (Fforde, Hubert, & Turnbull, 2002). Online systems offer an alternative to physical repatriation for those communities who may not have the means to support and maintain a hard-built cultural infrastructure. It can also fit within and complement such infrastructure.

In 1999, a computer workshop was held at James Cook University in Cairns following a number of visits to Laura by University staff. Quinkan Elders and other guests accessed the Web and some local Web pages containing a recent video of Elders talking about a honey tree. The viewing of this video prompted participants to tell other stories or their own version of a similar story. They also realised that a multimedia catalogue could act as a prompt for new stories and explanations and perhaps save the need to travel to far away story places (Nevile & Lissonnet, 2003). Following the workshop, a number of assumptions started to emerge with regard to the relationship between Indigenous culture(s) and the Web. Perhaps the Web could be harnessed as a prompt for cultural activity and assist communities in documenting stories locally and privately, as well as incite new narratives.

Following this workshop, the Quinkan Matchbox Project has been set up as a two-year ARC Project. Originally established in partnership with the Ang-gnarra Aboriginal Corporation, James Cook University (JCU), and others, it is now operated in a partnership between JCU, La Trobe University and Motile Research Pty. Ltd., with the support of the Quinkan Indigenous Community. The industry partners are engaged in the development of a metadata repository and content rendering system that will be given to the Community when it is completed ([Matchbox], 2002). The project comprises a (multi-disciplinary) research team of four post-graduate students with a background in Computer Science, Information Management and Indigenous Studies, each addressing a specific research question contributing to the overall aim

and design of the project. The research described in this thesis is one component of the Quinkan Matchbox Project.

A digital collective for the Quinkan culture

The Web allows the combination and integration of objects from distributed collections. As content becomes increasingly available across networked space, the traditional definitions and boundaries of what constitute a collection have shifted considerably. Dempsey (2000) remarks that collections have been unified by collocation and asks: “What does it mean to develop a collection in an environment where collocation is not a requirement? What criteria govern its assembly? How is it managed? Where resources are brought together from different locations to create a collection, what framework needs to be put in place to ensure its continuity?” (section 4.4). Dempsey’s questions were addressed to European libraries, archives and museums and were intended as a preamble to define a common research framework to accompany their move into a shared network space. They are equally relevant to communities with an interest in taking advantage of networked space to create (or re-assemble) their own collections. Gundestrup and Wanning (2004) describe the Web as “the ideal medium for reconstruction of exhibitions no longer in existence, and even for personalised exhibitions which will never come into existence except in cyberspace” (para. 2). Following a series of workshops as part of the Cultural Heritage Preservation Institute (CHPI) held in Native American communities, Smith and Holland have devised a possible model for the integration of distributed objects and collections called ‘a digital collective’ (Holland & Smith, 1999; Smith, K., 2002).

Holland and Smith’s digital collective model stresses the notion of collective responsibility in providing data and metadata about cultural objects. In the digital collective model, institutions of memory contribute on a par with individuals to the

collective, as the model acknowledges that users of the system are also potential contributors. The model is of particular relevance to the Quinkan context, because of the distributed nature of the Quinkan cultural materials and cultural property.

Figure 1. A model for the digital collective (Holland & Smith, 1999, Digital Collective Model Overview section).

Smith and Holland's model is in line with the work undertaken by large institutions and communities of practice. Examples include the Renardus service ([RENARDUS]), The European Library ([TEL]) and PictureAustralia ([PictureAustralia]) which seek to provide a single entry-point to resources held in a multiplicity of repositories or available on the Web. Distributed digital libraries have altered the traditional definitions and boundaries of what constitutes a 'collection'. In the physical library world, a collection is usually defined by physical demarcation or co-location of resources. In the networked world, objects need not be co-located. They can exist in multiple collections, have multiple instantiations and retain differing cataloguing and administration rules (Lagoze & Fielding, 1998; Lee, 2000). Distributed systems include collections of components deployed at different sites that are usually carefully designed to work together. By contrast, federated or heterogenous systems are cooperating systems in which components are designed and operated autonomously (Paepcke, Chen-Chuan, Winograd, & Garcia-Molina, 1998). PictureAustralia is one example of a distributed collection that uses a unified cataloguing profile to describe photographic items held by participating agencies.

It is possible to envisage the future 'Quinkan collection' as sharing the characteristics of the distributed systems described by Paepcke et al. Organisations and individuals could be asked to contribute materials, or at least descriptions of materials and information about ways to access them. The centrepiece of the system would then be a unifying catalogue profile for all materials contributed that would supply a single user entry point for discovery. In museums, libraries and government agencies, item description and database profiles have been designed to suit local use and purposes. They are informed by the requirements for the practice of art history, museum collection management or heritage protection. Database records describe

items presented in a multitude of formats, ranging from physical objects and their multi-media digital surrogates, to print and 'born digital' intellectual content. The challenge for distributed systems is to create common ground to share, represent and make digital content available to users. Behind the concept of 'inter-operability' stand the combined goals of using and re-using content widely, portability (across networks, systems and organisations) and longevity (portability across time) (Gill & Miller, 2002).

Consistency and standards are essential to achieve inter-operability. Although the choice of standards to describe digital content (cultural or otherwise) can be overwhelming, a number of principles are common to all domains of metadata. These principles inform the design of metadata schemata or applications. They are modularity, extensibility, refinement and multilingualism (Duval, Hodgins, Sutton, & Weibel, 2002). Metadata is defined as "structured, standardized descriptions of resources, whether digital or physical, that aid in the discovery, retrieval and use of those resources" (Hillmann, 2003a, section 1). Metadata is a 'grammar' that allows for lightweight, portable description of resources in a form of machine-readable statements (Baker, T., 2000a). A prescribed set of possible descriptive statements is known as an element set. These statements expressed using a variety of syntax (i.e., HTML, XML, RDF) are known as 'schemata'.

Dublin Core metadata is recognised as the standard of choice to describe resources for the purpose of discovery (NISO, 2001). The Dublin Core Metadata Element Set is a standard for cross-domain information resource description ([DCMES], 2003). It consists of 15 elements to describe the content, instantiation and intellectual property of resources (digital or not). A single set of metadata elements is rarely sufficient to describe all types of resources, for all sorts of

purposes. The modularity principle allows system designers to mix and match elements (and schemata) from a variety of metadata sets in order to suit their own local purpose. These composite schemata are known as application profiles. They can be defined as “schemata that consist of data elements drawn from one or more element sets, combined together by implementers, and optimised for a particular local application” (Heery & Patel, 2000, Background section). Dublin Core Working groups and large intellectual communities have created metadata application profiles (MAPs) for the education, library and government domains. Local implementers usually borrow elements from existing metadata sets. In theory, this flexibility should be the base for manipulating metadata with a view to sharing or exchanging it. In reality, the borrowed elements are often declared according to local rules and local practices that bear little resemblance to the original context. The proliferation of new profiles and schemata has lead to a high level of information diversity. In turn, this diversity has fostered semantic and syntactic confusion, rather than inter-operability (Gill & Miller, 2002).

Rationale

The Dublin Core Metadata element set is deeply influenced by the library and bibliographic tradition of resource description. The museum and cultural heritage groups expressed their doubts as to the suitability of the early DC (Simple) to describe cultural heritage material or to support the documentation needs of the museum community ([CIMI], 1999). Dublin Core has evolved since these assessments were made. Processes have been introduced to refine the original 15 elements. One of the original research questions for the overall Quinkan Matchbox project proposed to investigate the value added by these enhancements, specifically “the richer, deeper structured description of resources” supported by qualified Dublin Core ([Matchbox],

2002, Research questions section). The Quinkan Matchbox project also created an opportunity to test whether application profiles offer sufficient flexibility to design resource descriptions that are globally interoperable and reflect highly localised worldviews and concepts.

Aim

The aim of this research is to develop a metadata application profile (MAP) for the content of the Quinkan Matchbox. An essential requirement is to support the importation of records produced by a variety of intellectual communities with tolerable levels of loss. It must be Dublin Core compliant and inter-operate with records of institutions (or classes of institutions) most likely to enter in a partnership with the Quinkan community. Organisations such as the Australian Institute of Aboriginal and Torres Straits Islander Studies (AIATSIS), the National Museum of Australia (NMA), as well as PictureAustralia (through its contributing agencies) and the Environmental Protection Agency (EPA Qld) have been identified as holding material of interest to the Quinkan community. Libraries in Australia (and overseas) may also contribute valuable records. The yet uncatalogued Trezise Collection of archaeological charts and drawings of Quinkan Rock Art held at James Cook University are also considered for inclusion. The addition of local usage elements, refinements and vocabularies, to be determined in consultation with the Quinkan community, should ensure that the profile is suitably localised for use by the Quinkan people.

Challenges

In Australia, the establishment of community archives in Indigenous communities has been promoted through initiatives such as the Australian Indigenous

Cultural Network (AICN)[3] as well as State based initiatives, aiming at the creation of Indigenous Knowledge Centres (IKC). In the Northern Territory ([NT-Treasury], 2002), the development of IKC is designed "to use a range of multi-media technologies in the delivery of training and information, to better accommodate the differences in cultures based on oral and visual traditions" (p. 54). IKC initiatives focus primarily on infrastructure building and support as well as training opportunities ([Arts-Qld], 2003). Other projects involve the return of cultural materials through the creation of digital surrogates of artefacts that are then held locally ([ARA], 2003; Partos, 2003). Other initiatives can include a travelling exhibition ([Museum-Vic], 2003). The Berndt Museum of Anthropology has been running a project called "Bringing the Photographs Home". The project team has stressed the necessity to repatriate materials both in a digital and hardcopy format, in order to respond to the need of Indigenous communities to access their own archives ([Berdnt], 2003a; Stanton, 2003; UNESCO, 2001). Community archives are primarily organised around local use and local needs, not for interaction with other systems. Compliance with standards and inter-operablity are not considered as relevant issues in these activities. The focus on local use and repatriation via digital surrogates may reduce the need to make the archive interoperable. The challenge for the present research is to design an application profile for the Quinkan Matchbox records that is downward compatible and interoperable with standards-compliant DC records of existing subject gateways, libraries and other Australian (and international) collections. This should facilitate the importation (or harvesting) of metadata about cultural material without having to negotiate the return of digitised materials.

[3] Hosted at the Australian Institute of Aboriginal and Torres Straits Islander Studies (AIATSIS) in Canberra.

For Indigenous communities, the desire for return of cultural property and control over its use is matched by an equally strong ambition to produce and disseminate content for public consumption. The Lajamanu Elders chose CD-ROM technology to produce “Dream Trackers” (Glowczewski, 2000). The Yanyuwa community maintains a public Website ([Yanyuwa]). The Queensland Government is funding a string of regional visitor centres displaying interpretive content on fixed panels as part of its Queensland Heritage Trails Network ([QHTN], 2002). These methods of cultural content dissemination share the common characteristic of being static. Even with non-linear systems, such as CD-ROMs and Websites, the content usually remains classified according to pre-set (hard-coded) categories and is presented in a pre-determined arrangement with limited navigational options. The museum community is acknowledging that meeting the needs of the online users of cultural content will require new ways of fielding data and new ways of creating content (Cameron, 2003). Digital cultural content is often profiled in institutional information systems to support management and curatorial functions. As was the case in the pre-digital era, the Western point of view on management and interpretation of cultural materials is prevalent. In the digital era, online users of cultural material set new challenges to the traditional way of managing artefacts. Cameron (2003) foresees a move away from empirical and authoritative statements about objects towards multiple and more subjective narratives.

The basic functionality of an information system dedicated to cultural management should also respond to the specific challenges set by for its future use by an Indigenous community. The system should be more than just a catalogue enumeration and should aim to provide a ‘cultural environment’. In very simple terms, it should provide an environment that allows users to connect things that they

perceive as being related. This aim is informed by the project team's understanding of the concepts of culture and heritage from an Indigenous point-of-view and best summed up as 'Country' or cultural landscape (Allen, 1997; Langton, 1994; Rose, 1996; Rose & Clarke, 1997; Strang, 1997).

Scope

This research comprises the aggregation, harmonisation and testing of a proposed metadata application profile to be used to describe the resources to form part of the future Quinkan Matchbox collection. Testing of the draft MAP includes re-cataloguing real records from online library and museum catalogues and the Web using the draft MAP. This batch of sample records should be sufficient to test that pre-existing records can be transferred into the Quinkan catalogue without any loss or with an acceptable level of loss.

When the Quinkan Matchbox system is delivered, the adequacy of the descriptions will be further tested with the writing of queries with a view to establish that records can be easily discovered through either the Search or Browse section of the system. This essential long-term part of the research and development process is not reported in this thesis. This research will not cover the development of a full ontology for this Indigenous culture. It will not include the gathering of sensitive Indigenous content, although some content will be used for testing. This research also recognises the limits imposed by the researcher's necessarily 'outsider status' to produce a suitably localised and customised MAP and acknowledges the necessity to seek further input from the Quinkan community.

The proposed MAP is only a starting point to build a virtual cultural institution. It acknowledges the fact that issues such as Web development and IT training and technical support will need to be addressed in order to secure the viability

and sustain the interest of the community in the system. This research does not intend to solve technical issues, such as user authentication, security, system maintenance, some of which will be considered by other members of the project team. The negotiation of memoranda of understanding (MoU) between potential content providers and the Quinkan community is not part of this research.

This research recognises the contradiction between acknowledging Indigenous cultures as living cultures and attempting to hold them captive in 'systems' for preservation (Michaels, 1986; Merlan, 2000). It is aware that repatriation of objects or archival materials (digitised or not) may have a destabilising effect on communities if not handled with sensitivity and with respect for Indigenous protocols (Edwards, 2003; Saunders, 2002). The negotiation of these protocols is not covered in this thesis.

Outline of the thesis

Chapter 2 introduces briefly 'Quinkan country' in southeast Cape York, its geography, history and the township of Laura. The design of a profile for the Quinkan Matchbox leads to problems of cultural and content definition. Chapter 2 also includes a survey of the literature showing the differing Western and Indigenous views on heritage. The review also places the preservation of Indigenous heritage through online networks and multi-media technology in the context of cultural globalisation, control over intellectual property and traditional modes of transmission of cultural knowledge.

Chapter 3 explores the digital collective model and examines its potential for practical implementation in the Quinkan context. This chapter also examines the opportunities afforded by metadata, with particular regard to Dublin Core. As the Quinkan Matchbox project recognises the necessity of accommodating data from a

large variety of external sources, the basic strategies leading to inter-operabilty between federated systems are also assessed.

Chapter 4 and 5 detail the methodology used to assemble a draft metadata profile. Chapter 4 reviews a number of metadata specifications used in the cultural heritage community and justifies their selection (in whole or in part) for the Quinkan profile. A draft application profile is assembled in Chapter 5 by aggregating, then harmonising metadata elements from Dublin Core with elements from other metadata sets. In Chapter 6 the composite profile is tested by cataloguing 'real' resources in order to evaluate the ability of the MAP to accommodate the cataloguing practices of anticipated members of the collective, with minimum loss or distortion. Chapter 7 will discuss the localisation of the profile. The introduction of local usage elements (and their refinements) and classification schemes may enhance the profile's ability to reflect in a more accurate way the contours and reliefs of the Quinkan cultural landscape. This chapter will also discuss the difficulties encountered in elaborating a 'local' taxonomy based on grounded categories.

In conclusion, the research will also discuss the difficulty and inadequacies of applying conventional requirement gathering techniques in this Indigenous context. In the digital collective model, the metadata is only a small component of a large assembly of technical infrastructure, legal agreements and human engagement that is still to be built, financed and staffed. Far from being a final delivery, the production of the MAP is only the first iteration of a process requiring the ongoing scrutiny, assessment and feedback of the Quinkan community.

Methodology

The process for assembling the Quinkan application profile follows the 'ARH' framework: aggregation, rationalisation and harmonisation (Currie, Geilesky, Nevile, & Woodman, 2002). The methodology was developed by Currie et al. in an attempt to help information managers from various Victorian State agencies to visualise inter-operability. The purpose was to develop "a central, comprehensive application profile derived from the current requirements and foci of all users" (p. 179). The 'users' are State government agencies in this context. The ensuing central profile does not place "limits on high level local specificity but enables deep and comprehensive metadata inter-operability across the particular participating groups" (p. 179).

The design of the Quinkan Matchbox application profile presents a unique challenge for the researcher. The collection is unbounded and undefined. The users are largely unknown. Although the future owners of the system have indicated some interest in using technology to solve their 'business problem', they are not sufficiently familiar with it to articulate wants and needs that could be translated into technical and functional requirements. In Laura, as in many Aboriginal communities, the time and commitment of a small group of persons is solicited from many to attend to too many pressing matters. More specifically, the building and management of the future Quinkan interpretive centre (as part of the QHTN initiative), native title matters, health and everyday business affairs, and more, have competed for the limited time and energy of the same people who have a stake in the Quinkan Matchbox project.

Methodologies and tools used for information systems development presuppose that needs are clearly identified and that system analysts will be assisted in their investigations by the future users of the system. Available tools include any combination of interviews, questionnaires, observations *in situ*, review of existing

documentation and procedures, the conduct of Joint Application Design sessions (JAD), structured walk-throughs and many more (Satzinger, Jackson, & Burd, 2000). Some of these tools (and the basic assumptions that led to their development) do not fit well within the Quinkan context. This is an environment where exchange of information is strictly regulated. One is not free to walk into the field and ask questions at random. Stakeholders and researchers alike will have difficulties talking into existence a technological tool that is still an abstract entity.

Systems design starts with the researcher attempting to understand (and model) how business is conducted. In a business or organisational setting, simple questions like ‘What do you do?’, ‘What steps do you follow?’ and ‘What do you need to know to do your work?’ can be powerful investigation starters. Actors can be observed, documentation and procedures can be analysed. This concrete and empirical base contributes to a better understanding of the kind of activities that are conducted ‘here’. The activities conducted in the Quinkan field are different. It is not so much business processes as cultural processes that need to be investigated. In this case, how can one ask questions like ‘How do you do culture?’, ‘What is your world view?’, ‘How do you organise your world?’ and expect an answer.

Reviewing documentation and existing procedures does not have any equivalent for human activity as a meaningful whole. Anthropological material about this region is scarce and may not be an appropriate base from which to analyse the Quinkan environment. Important events can be highly codified without being documented. The research must also consider that living cultures re-invent traditions continuously must also be factored in. Culture is ‘in the doing’ and a point of view could perhaps be formed through observation. However, many cultural activities are of a secret/sacred nature. Conducting anthropological research in Laura is a task for

which the researcher has no qualifications or mandate and whose scope would far exceed the allocated timeframe.

Gathering cultural content is also outside the mandate of this research. Applying anthropological methods would see the research flirting dangerously with placing the community in the role of investigated subject, instead of active participants in the project. As much as fieldwork is seen as essential to get to know the people and the country, its limitations are evident. During the extremely short stay in Laura (August 2002, April 2003), few questions could be asked that would directly translate into technical implementation. Fieldwork is more about getting a 'feel' for the location than finding definite answers to practical questions.

The methodologies and tools described above apply to system design in general. There is little literature about methodologies to design schemata. Dekkers (2001) contends that most schema designers follow processes that can be summed up in four main steps. First define metadata requirements. Then select the most appropriate existing standard metadata element set. Where possible, use standard elements for locally required elements, possibly narrowing semantics and adding local rules and vocabularies. Finally, define any remaining elements in a private namespace. Schema design is either user or resource driven because either (or both) are well known. Standards are paramount.

In the Matchbox project, Dublin Core (qualified) is the paramount standard from which an application profile is to be designed. Resources are not clearly identified, but the type of resource can be expected to include, at least, books, reports, objects, films, and sound recordings. The description of these resources can be informed by the types of activities these resources will support (i.e., stylistic analysis, management, history or geology). The kind of functionality the designer wants to

offer to users of the system (simple search, advanced search, browse, filters, sorting) may influence the design. Some description requirements are inherent as resources themselves (pagination for a book, footage for a film reel).

A review of the standards and best practices used in the cultural heritage domain will provide the base for assembling a (draft) application profile that is interoperable with those of other identified organisations holding Quinkan material. The researcher's very embryonic knowledge of the Quinkan culture can be used to suggest ways to refine and localise the profile (in anticipation of community feedback). Considering the particular circumstances in which this research is carried out and having regard to the difficulties of engaging the main stakeholders with the abstraction that is Matchbox, the building of a prototype may provide all parties with a concrete base. The prototype will be imperfect, at best a series of suggestions, from which to exchange ideas and interact with the technology. As much as the original 1999 workshop used a video recording as a trigger for cultural activity, it is envisaged that the prototype will act as a similar trigger to elicit user feedback.

For Avison and Fitzgerald (1995), prototyping addresses some of the problems of traditional systems analysis, in particular, the complaint that users only saw their information system at implementation time when it was too late to make changes. They note, "by implementing a prototype first, the analyst can show the users something tangible, inputs, intermediary stages and outputs, before finally committing the user to the new design" (p. 77). They also advance that the prototype approach may be the only way "the users discover exactly what they want from the system, as well as what is feasible. It is also possible to try out a run using real data, perhaps generated by users themselves" (p. 77). The authors list circumstances when this approach is particularly appropriate:

- "The application is not well defined
- The organisation is not familiar with the technology required for the application
- The communication between users and analysts is not good
- The cost of rejection would be too high
- There is a requirement to assess the impact of a prospective information system" (p. 77-78).

Avison and Fitzgerald note that prototyping is also a way to encourage user participation. This approach is, however, not perfect. It is time consuming and costly and in this case would require complex and costly logistics for moving the prototype and people between Laura and Melbourne. The production of the first iteration of the prototype (MAP and underlying software) has largely consumed the time available for the project. Producing the 'real' Quinkan MAP may take years, and would probably require an on-going commitment (and financial support) by all parties involved.

Deliverables

The main deliverable for this research is a Dublin Core based Quinkan-specific MAP for the Quinkan Matchbox. The MAP is to be written using the formal technical writing standards specified by the Dublin Core Working Groups ([DCMI-WG], 2003) with additional explanation about the source and purpose of each element and encoding schemes used in the profile (see Appendix 3). A sketch showing how the MAP is used for discovery and content rendering at user interface level is included in the submission (see Appendix 2). Papers written during the course of this research and accepted for presentation at refereed conferences are referenced in Appendix 1. A tentative taxonomy will also be proposed to organise resources for browsing in the working version of the Quinkan Matchbox.

CHAPTER 2: QUINKAN COUNTRY: INTERPRETIVE CONTACT ZONE?

The country

'Quinkan Country' is located in Tropical North Queensland, in the southeast region of Cape York at the very northeast corner of Australia. Quinkan country is bounded by the Laura sandstone ridge, which extends 100 km along an east-west axis from the Cooktown hinterland to the Hann tablelands. The southern boundary follows the course of the Palmer River. The northern boundary is located along the alluvial plains of the lower Normanby River and the hinterland of Princess Charlotte Bay (Cole, 1995). The main population centre, Laura, is situated approximately 290 km to the north west of Cairns. The region is famous for its Rock Art: an estimated 100,000 paintings and engravings are scattered in natural galleries and sites throughout the lush savannah and high escarpments of Quinkan country.

Evidence of habitation in the Cape York Peninsula area goes as far back as 40,000 years. Contact with Europeans is thought to have begun with the explorations of Dutch navigators in the early 17th century. Captain Cook landed near the present town of Cooktown in 1770, with many more ships following for exploratory work or as passing traders. European exploration and settlement started in the mid-1800s, with a movement of expansion from the established colonies of the southeast coast of the continent towards the north and inland. Colonisation and settlement started in 1863 with the establishment of the Somerset settlement and the issuing of the first pastoral leases. By the 1870s, gold was discovered in the Palmer River area, prompting a rush of new arrivals. Local histories mention that by August 1874, 5,000 Europeans and 2,000 Chinese were panning for gold in the region. Cooktown became the hub of a permanent line of supply, with goods shipped in from the southern centres and freighted to a string of boomtowns established along the Palmer River. The

Indigenous contact with European and Chinese immigrants was often extremely violent, resulting in massacres and displacement of local Aboriginal groups from ancestral land to the fringes of mining camps and newly built towns (Maytown, Cooktown) and, later on, missions and reserves. The gold rush prompted a rapid uptake of large pastoral leases. Unlike the goldfields, the newly established land leases were in need of labour. This situation marked the beginning of the long and often vital involvement of Aboriginal labour with the pastoral industry. The township of Laura was founded in 1888 when the railway from Cooktown, and intended to service the goldfields, was extended. By 1897, Laura had become a thriving community servicing the inland populations of the pastoral industries and the, by then declining, goldfields (Morwood & Hobbs, 1995; Ruig & Morwood, 1995).

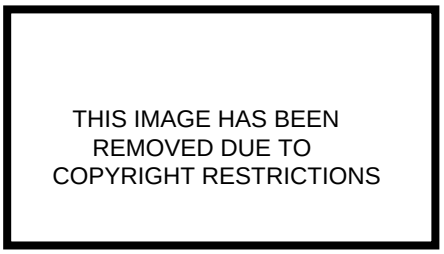


Figure 2. Laura in SE Cape York.
Source: Pacific Island Travel

Modern Laura is in the centre of Quinkan Country on the main north/south and east/west road junction in Cape York. In 1962 the railway from Cooktown to Laura was dismantled. The loss of the rail connection and the end of gold fever left Laura as only a shadow of its former self. Today, Laura is a community with only about 60 residents and at best is a very

small service centre for both the nearby pastoral properties and the travellers heading further north. The facilities include a hotel, a roadhouse, a general store with a post office and a petrol pump, a small community centre with a tiny library, and two or three seasonal camping grounds. The local residents pin much hope on cultural tourism to secure the town's continuing development but a lot needs to be done to realise such a goal. Many bus tours and independent tourists pass through Laura on their way to the tip of Cape York or the fishing spots of the northern waters. Few travellers take more than a cursory glance at Split Rock, the only publicly accessible Rock Art site, which is located 10 km south of Laura. Up to date and locally produced tourist information that would entice travellers to visit the locality is sadly lacking, online or in print.

The local Indigenous community is composed of a number of families representing different language groups, some of which are descendants of the original inhabitants. The Ang-gnarra Aboriginal Corporation was established to manage the Ang-gnarra Lands (formerly Quinkan Reserves). Although the displacement of the original inhabitants caused a great deal of disruption to traditional life, the sense of connection with ancestral places remains strong. Much of the Rock Art was 're-discovered' in the 1960s by bush pilot Percy J. Trezise who started documenting paintings and recording stories with Aboriginal people whose country covered the Laura sandstone region and beyond (Trezise, 1993). The return of the land to the community represents a further opportunity to strengthen the sense of connection between the local Indigenous community and its heritage.

The Ang-gnarra Aboriginal Corporation has at times run a Ranger program designed to care for the Rock Art sites and guide visitors (Musgrave & Steffenson, 2000). The local and remotely located Elders are very active in cultural heritage and

conservation issues. Laura is also known for the Aboriginal dance festival held on the local festival grounds near Split Rock. A new interpretive centre is in the process of being built as part of the Queensland Heritage Trail Network ([QHTN], 2002). Locally, the interest in heritage promotion, Indigenous and otherwise, is strong. But many questions regarding the production and management of Aboriginal cultural content for public consumption, online or on display panels remain open for consideration.

Defining cultural content

The Quinkan Matchbox is intended as a cultural tool. This might have presupposed that the contour of cultural content for any community can be drawn or that culture can be defined before being profiled, but this is not the case or presumption here. The project recognises the fluctuant, porous nature of human and cultural boundaries in most societies. The development of a metadata profile for the Quinkan culture introduces questions of cultural definitions. The researcher is also confronted with a methodological and ethical dilemma. How does an outsider investigate ‘culture’ in an environment where the right to speak is highly regulated? Can systems represent the infinite nuances and variations of human experience and affects? Is the creation of a digital archive sufficient to ensure the revitalisation or the strengthening of community identity?

A registry of tangible assets

When designing application profiles, the main parameters are usually users and objects. The most visible incarnation of the Quinkan culture is represented by a large corpus of Rock Art. For these types of objects, descriptive profiles are readily available or easily devised. A catalogue with an archaeological focus can easily be built that would describe archaeological artefacts ranging from an isolated Rock Art

motif to a large site and its immediate environment. Its profile could replicate the record-keeping structure of archaeologists or environmental agencies with much attention paid to physical description, condition and degradation reports. If need be, a few interpretive stories could be appended. It is unlikely that a standard material heritage management system would represent Quinkan culture as a whole or that it could replicate the kind of ‘cultural doing‘ taking place in real life.

The focus on material artefacts is too narrow and does not encompass the wealth of human experience that makes up ‘culture’. The search for the future content of the Quinkan Matchbox is also a search for definitions for ’culture‘ and ’heritage‘ and what it might mean in the Quinkan community context. The common definitions of these terms have been in constant evolution, over time and across intellectual disciplines. These changing definitions in turn have had an impact on preservation practices and philosophies, as well as the legal framework in which the preservation work takes place. Slowly, preservation practices are seeking to reflect and encapsulate Indigenous views on matters of culture and heritage.

For Trigger (1984; 1989), archaeology has been exported to Australia as part and parcel of the colonial baggage. Byrne (1991) describes how archaeology was used in the Australian colonial context to justify and maintain relations of power at a local level. The early preservation work undertaken by museums has also been be interpreted as an expression of guilt or even complicity in the destruction of cultures operating with different modes of transmission, such as oral traditions (Healy, 1997; Sculthorpe, 1985). ‘Cultural heritage management’ was born in urgency, with the necessity for preserving fast disappearing sites. It was also administered in a bureaucratic style through the establishment of agencies attached to either museums or government departments (Byrne, 1991). Writing ten years later, Byrne remains

adamant that the heritage assessment process in Australia is still prisoner of a registrar's vision of heritage. Heritage assessment is still very much steeped in architecture and archaeology, and largely ignorant of the social sciences (Byrne, Brayshaw, & Ireland, 2001). As an example, Byrne criticises the administration for engaging Indigenous consultants in archaeological work only and failing to bring information on Aboriginal social values into the assessment process. Byrne feels that heritage values are still perceived as being 'in the field' rather than in communities. And he goes on to describe inventories as "commodifiers" through which "the recording becomes more real than the place itself" (p. 56).

In her charting of the evolution of archaeological practices in Australia, Colley (2002) offers a reminder that in Western societies, it (heritage) is often split between humanly produced heritage (buildings, artwork) and environmental/natural heritage (landscape, place, animals). For Colley, this split, commonly embedded in national and international laws, is inappropriate to Indigenous worldviews, although it is apparently acceptable in the context of scientific research.

Reading cultural landscapes

Definitions of content that are more relevant can be derived from a better understanding of the Indigenous view of 'heritage' and the role played by archaeological sites in it. When Indigenous authors explain their world (or world view) to a wider, non-Indigenous audience through writing, the central and recurring word is always 'Country' (Rose, 1996; Sharp, 2002). Langton (1994) points to the necessity of understanding cultural landscapes. "The concept of 'country' embraces all the values, places, resources, stories and cultural obligations associated with the geographical area" (p. 16).

Strang (1997) has documented the different readings of the landscape of both the White and Indigenous communities of Kowanyama and surrounds (Western Cape York). She notes that "'Country' as an organising force thus remains central to personal identity, group identity and relations between people and land. 'Which mob you belong to?' is invariably answered geographically and socially" (p. 138). As part of her work, she has conducted 'mapping' campaigns with Elders who wanted to record cultural information for younger generations. She took each Elder to a different part of Country for several days and let them decide what was important for her to learn. "Their information focused immediately on the spiritual and social aspects of the landscape – the Dreaming tracks, the stories, the poison places and who belonged where. This was followed by a wealth of environmental and historical information – bush lore, traditional uses, massacres, meeting-places and suchlike. The result was a precise European-style map containing wholly Aboriginal information about the country" (p. 223).

Colley (2002) provides three examples of the impact of a holistic approach to heritage on archaeological and heritage management practices. She cites Allen (1997) about revisiting environmental management practices in Kakadu. Allen explains that the Indigenous Management Committee wanted research directed "away from archaeology and Rock Art and towards oral histories of the Elders associated with the park (p. 145). Colley also mentions the work of Knight (1997)[4] in South Australia. Knight has described Indigenous understandings of landscapes, which incorporate places and things archaeologists call sites and artefacts in terms of messages, which knowledgeable Indigenous people can read through a series of cultural rules.

[4] Knight, J. (1997). *Perception of the archaeological record.* Australian Association of Consulting Archaeologists Incorporated Newsletter 72: 11-13. (original source not consulted)

Ross (1996), also quoted by Colley, provides another example with a community archaeology project run in association with the Quandamooka people. This project uncovered previously ignored values associated with land and water marking. The Quandamooka vision of heritage has been further explained by Ross who compared the EPA point of view on heritage and heritage management with that of the members of the Quandamooka Land Council. Ross's research pointed toward some crucial shortcomings in conventional site recording practices. While site records keep track of grid coordinates and static and bounded locations, they fail to establish minimal records of relationship with other sites and do not mention synergy between place and setting, whereas Quandamooka people always link heritage place to landscape or seascape. Ross's research demonstrates that archaeological sites are by-products of heritage, not heritage itself. It also shows that sites cannot be treated separately from the country and the people who live there. Ross notes that from a Quandamooka perspective "a heritage landscape is more that the sum of its parts" (p. 110).

Heritage as social process

Cultural heritage professionals have been concerned with finding new theoretical bases for cultural heritage assessment that move away from the 'registrar view' to include social processes (Byrne et al., 2001). Traditionally, archaeologists adopt the 'inherent' value model, by which the value of a place can be read from the place. Byrne et al. would like more attention paid to the 'attributed' meaning model. In Byrne's model, significance and meaning are conferred on a place by the community. This model places communities, not objects, at the centre in the overall scheme of cultural heritage. It recognises the primacy of local knowledge in ascribing social value and meaning to heritage sites. Byrne builds his argument around the

definition of local knowledge coined by cultural anthropologist Geertz's definition of "significant worlds and the indigenous outlooks that give them life" (Byrne et al., 2001, p. 48)[5]. Byrne proposes a vision of heritage work in the wider community that is quite similar to the Indigenous way of reading a cultural landscape (Langton, 1994; Rose, 1996; Strang, 1997). It is about deciphering the tenuous and invisible markings in the landscape and understanding the discreet network of relationships between place, people and meanings. For Byrne, social significance assessment is concerned with the "landscape of memory: the invisible component of the cultural environment which consists of the *associations* which both natural and 'built' features of the landscape have for people" (p. 52).

Local memories and national narratives

Byrne's call to take local knowledge into account in the heritage assessment process is echoed by the increasing interest of museum curators in the inclusion of local histories and personal histories in curatorial practices. Commenting on the way Australian museums represent Aboriginal histories, Sculthorpe (2001) notes, "local histories and cultures are largely absent. Rather emphasis is placed either on regions, broad culture areas or pan-Aboriginal approaches, although local case studies are occasionally included" (p. 80). She contends, "for Indigenous people, the subject of greatest interest in museums are usually local ones. Interest in local Indigenous histories and cultures is evident throughout Australia with the establishment of many keeping places, cultural centres, language centres and the writing of personal histories" (p. 80).

[5] Geertz, C. (1983) *Local knowledge: further essays in interpretive anthropology.* New York: Basic Books. The spelling of the word 'indigenous' is from the original source.

Sculthorpe (2001) opposes the anthropological approach within museums to the historical approach. She defines 'Aboriginal histories' as "stories about Aboriginal people that consider chronological perspectives, that consider the relationship between Indigenous people and other Australians, and that make use of historical sources such as social history objects and documents. This is in contrast to anthropological or cultural approaches within museums that are essentially ahistoric in approach, that focus on the internal dynamics of Aboriginal societies and that make primary use of ethnographic collections" (p. 74). Her reflections about Aboriginal histories are very much informed by the recent Australian context of the history wars and debate over reconciliation. Museums are keen on attracting mass audiences. Sculthorpe, in her capacity as Director of Indigenous programs at Museum Victoria, is fully aware that the general public is more at ease with Aboriginal culture (i.e., use of Aboriginal symbols on jumbo jets and other corporate logos), but less so with history, as it would force the recognition of past mistreatment [6] (Sculthorpe, 2001). She remains convinced that local history provides an opportunity to understand national debates and themes, such as histories about pastoralism, frontier violence, killing times, dispossession, and work conditions or contributions to pastoralism and national development. "Compared to grand (national) narratives, local histories allow one to relate to protagonists as individual people with specific and complex motivations and to explore the wider issues at close range" (p. 70).

The idea of using local histories to re-appraise national narratives is also defended by Kavanagh (1996) in the wider context of historical museums. "In many

[6] See also John Ah Kit: "People chose to be blind to this living heritage because it confronts them with a shared history of colonialism in the Northern Territory – and it makes them uncomfortable" (Ah Kit, 1995, p. 35).

ways, museums are a meeting ground for official and formal versions of the past called *histories*, offered through exhibitions, and the individual or collective accounts of reflective personal experience called *memories*, encountered during the visit prompted because of it. History and memory meet in the collections, within the research process and within a museum visit" (Kavanagh, 1996, p. 1).

Culture and tradition: frozen assets or living practises?

The discourse on the permanence of tradition is particularly potent in Western societies. It is as illusory as it is useful to cope with the pace of change that seems at times out of control. In his examination of Western societies' relationship to the past, Lowenthal (1985) notes "recognizing the impact of the present on the past, we confront anew the paradox implicit in preservation. Vestiges are saved to stave off decay, destruction, and replacement and to keep an unspoilt heritage. Yet preservation itself reveals that permanence is an illusion. The more we save, the more aware we become that such remains are continually altered and reinterpreted. We suspend their erosion only to transform them in other ways. And saviours of the past no less than iconoclasts are bent on its destruction" (p. 410).

The discourse on tradition and its permanence is a double-edged sword. It can become detrimental to Indigenous interests, especially when it is underlined by visions of frozen cultural continuity and unchanged rituals. The argument that contact with immigrant cultures destroyed traditional cultures (popularised by the press and Indigenous advocacy alike) is often used to deny recognition of 'tradition' understood as continuity. Harrison (2000) argues that this vision provided a basis for the rejection of the Yorta Yorta's Native Title Claim. In his judgment, Justice Olney emphasised the history of contact between the claimants and European settlers and the changes that are perceived as having ensued as a result of it. Harrison criticises this view,

because what is seen as ‘authentic’ sends us back to a deep past instead of recognising present culture as a continuation or an adaptation of tradition. The judgement fails to recognise the constant adjustments of traditions to the present reality. It is emblematic of the differing appreciation of ‘the past’ between societies relying on the spoken and the written world as a source of authority. For Lowenthal (1985), “people in so-called traditional societies confidently assert that things are (and should be) the way they always have been, for oral transmission accumulates actual alterations unconsciously, continually readjusting the past to fit the present. Literate societies less easily sustain such fiction, for written – and especially printed – records reveal a past unlike the present: the archives show tradition eroded by time and corrupted by novelty, by no means faithfully adhered to” (pp 40-41).

Material culture is used to support claims to power, knowledge and territory. In the case of a culturally disrupted region, the argument of continuity can deliver the final blow against claimants. Layton (1995) describes three historical reasons to explain why Australian archaeologists have been reluctant to accept that living people knew anything about the Rock Art around them. First, there was the failure to interpret Aboriginal statements within their cultural context. Archaeologists have often interpreted “Dreaming” stories about Rock Art as being separated from the current culture. Secondly, the prevalent vision of Indigenous people as a “doomed race” informed the belief that traditional knowledge had not survived disruption. Finally, Layton argues that archaeologists had an inadequate theoretical framework to make interpretive statements about culture. Layton illustrates his point with statements made about Rock Art at Laura by a Traditional Owner and a young ranger. Layton asks about the correspondence between the current readings of the Rock Art and those that could have been obtained 100 years ago. He concludes that current

meanings have been “renegotiated” by current custodians, but concedes that, as an outsider, he has no right to judge whether the current readings are authentic or not. Only the living Aboriginal community can make this judgement.

In *A certain heritage*, Coombs et al. (1983) assert “No human tradition is fixed and unchanging. Traditions are part of social processes, which are always undergoing adjustments, manipulations, re-appraisal and adaptations”. Further on, “These transformations in no way impinge on the central themes or imperatives or values of that tradition” (p. 28). The authors illustrate their point by citing a number of studies that have demonstrated the adaptation and endurance of Aboriginal culture and identity following contact and displacement. One of these studies is Langton’s debunking of the social scientists’ great deception about urban Aborigines and their failing to recognise the ‘Aboriginality’ of adjustments to city life (Langton, 1981).

(re)collecting together

Collection definition and development provide a backdrop to explore further the digital collective model developed by Holland and Smith (1999) and examine its potential for practical implementation in the Quinkan setting. The model was born from the authors’ interaction with Native American groups and the realisation that the dispersal of collections combined with the lack of exhibition space in museums presented Native American communities and the general public alike with a major hindrance to access (Holland & Smith, 1999; Smith, K., 2002). This is very much the situation faced by Australian Indigenous communities whose efforts to strengthen or revive cultural identity are often marred by their inability to access cultural materials held by large cultural institutions and private collections, thousands of miles away. Communities are approaching cultural institutions to request the effective repatriation of objects and artefacts in increasing numbers. In some cases, they trade safekeeping

in distant institutions for easy access and temporary loans. Others have received original or digitised surrogates of ancient photographs from the museums, to be added to a community archive ([ARA], 2003; [Berdnt], 2003a; Partos, 2003). Many communities cannot, however, afford the cost of building and supporting the facilities required in order to house cultural materials locally. Commenting on the North American situation, Clifford (1997) has noted “some native groups do not want physical possession of traditional objects; they simply want ongoing connection and control” (p. 212).

In selecting the word ‘collective’ instead of ‘collection’ for their model, Smith and Holland (1999) propose “an organizational structure that draws in contributions from individuals and collectors and encourages comment and connections amongst viewers” (Defining a digital collective section). Their ideal collective goes beyond the electronic window that is now part of most cultural institutions. Smith (2002) describes the collective as “a complex system for storing, describing, accessing, and using digitized multiformat materials”. The digital collective is envisaged as “a community space where non experts and ordinary people can enter their digital objects along with their information, stories, and experiences about their own or other objects in the collective database”. Another major difference with cultural institutions is that the collective is interested in collecting current object and information, rather than waiting until they reach an archive, library, or museum. Smith (2002) contends that “ by allowing people to self-select materials to contribute to a collective and add their own knowledge about materials already in it, the collective becomes a record of society itself in addition to a rich repository of objects and descriptive information” (Principle five section).

Holland and Smith's proposal emphasises the collective responsibility of individuals and institutions in assisting Indigenous communities piecing their culture back together. A collective can be interpreted as an invitation to the general public to join Indigenous communities in a cultural heritage partnership and contribute personally to the growth of their collection. For Byrne et al. (2001), the term '(re)collected' coined by Clifford in *The Predicament of Culture*, conveys the sense of remembering and gathering together. It is still a contentious and unresolved question whether culture can be captured in a catalogue and handed down without the mediation of knowledgeable Elders. It is equally contentious to purport that digitising materials is sufficient to ensure cultural preservation.

Fienup-Riordan (2003) has described a visit by Yup'ik Elders (from Alaska) to the Berlin Museum of Ethnology as 'fieldwork turned on its head' and an example of what she calls 'visual repatriation'. Elders were granted unrestricted access to many objects held in the German museum. Their intention was not to reclaim the objects, rather "to re-own the knowledge and experiences the objects embodied" (p. 39). Objects evoked names, stories, personal experiences, actions and songs. The Elders' documenting of their fieldwork in Berlin included not just taking photos and videos of their work sessions, but also recording the sound produced by certain objects.

Worcman (2002), director of the Museum of the Person in Brazil, invites believers in an all-technical solution to consider a few simple but crucial points: "Will digitizing the culture or history of these collective entities in fact include the communities in the process of formation and diffusion of their knowledge? Or will the digitization process simply reproduce the Western conception of storing in museums and libraries what those in the west deem to have cultural value? Does the mere act of

digitizing artifacts and recording narratives of oral traditions contribute to reinforcing the self-esteem of the group whose cultural knowledge is being digitized?" (Digital Technology and Social Inclusion section). There is a growing recognition that the damage done by 200 years of social and cultural disruption cannot be mended without resorting to creative strategies.

In Australia, Elders like Matilda House of the Ngunnawal people have delivered powerful calls for a project of reconstruction of the past that is collective and reaches beyond the confines of communities. They have also pointed at the extreme difficulties faced by modern elders who have to recreate stories for the benefit of the younger generation (House, 1995). Byrne, an advocate of the inclusion of the notion of social significance in heritage work, notes that people's involvement in heritage work contributes to the strengthening of the community identity as a whole. For Byrne, social significance places people and communities at the centre of the process, both as heritage workers and heritage makers. Recognising the contribution of individuals to heritage work also contributes to widening the notion of what constitutes 'culture' beyond the confines of precious and ancient artefacts belonging to a distant past (Byrne et al., 2001).

Kavanagh (1996) notes "Memories are the substance of the oral histories museums gather and should be, in theory at least, a good part of the records behind the object collected" (p. 1). Staff at AIATSIS and NMA have indicated that visiting Elders are often asked to give information about objects held in the vaults (Field Notes, November 2002). Should the digital collective be implemented, objects could be returned to the community via digital surrogates, and documented by the Elders for the benefit of both cultural institutions and the local community. Larson (quoted by Holland & Smith, 1999) also notes that the Internet allows oral cultures to be returned

and maintained in their original format (complete with emotion, inflection and background noise) and to be shared with larger audiences, free of the denaturation caused by the transfer to a written document.

The notion of ‘collective‘ could also be extended to encompass system ‘reflexivity‘. Reflexivity may be the key to the long-term viability of a digital collective. In time, individuals may expect more than a one-way contribution to the collective. They may want to make connections with the collective, either for a one on one conversation with a moderator or with other members of the collective.

Collections as contact zones

The concept of collective paves the way to visions of collaborative practices, renegotiations of power relationships and control over cultural representation. Museums are grappling with the issue of including the Indigenous viewpoint in every step of the curatorial process. Practical solutions have included an overhaul of curatorial practices, changes in displays and labelling of exhibits, the recruitment of Indigenous curators and routine consultation with communities.

Invited to witness a consultation between local Tlingit Elders and the Portland Art Museum (Oregon, USA), Clifford (1997) felt the power relationship between the museum and the community shifting. “As the meeting progressed, the basement of the Portland Art Museum became something more than a place of consultation or research; it became a *contact zone*” (p. 192). Clifford borrows the term from Pratt (1992). Pratt defines the term “contact zone” as the “space of colonial encounters, the space in which peoples geographically and historically separated come into contact with each other and establish ongoing relations, usually involving conditions of coercion, radical inequality, and intractable conflict” (p. 6). By contrast, Pratt defines the term “frontier” as “grounded within a European expansionist perspective (the

frontier is a frontier only with respect to Europe)" (p. 7). According to Clifford, "when museums are seen as contact zones, their organizing structures as a *collection* becomes an ongoing historical, political, moral *relationship* – a power-charged set of exchanges, of push and pull" (p. 192).

Edwards (2003) describes photographic and film materials as "a site of intersecting histories – the visual legacy and historical deposits of sets of encounters and relationships. They emerge from a multiplicity of shared experiences, from the violent and intrusive to those of friendship" (p. 83). Edwards rates highly the potential of such materials as memory-salvation tools. Although she situates photo elicitation within the "classic power relation of anthropology, its methods and goals" (p. 87), she remains optimistic that healthier premises can be found for the re-engagement of communities with their own images. In Edwards' view, emphasis should be less about 'questioning the natives' for the benefit of museum personnel and more about acknowledging sensitivities, boundaries and the social impact. For Edwards, photos and films are not passive images of the past, but active and dynamic. They are "interlocutors in the process of telling stories" (p. 87). If the vision of the digital collective were to be fully realised, Indigenous communities would be empowered, in Clifford's words, to share authority over the curation and interpretation of materials. Their status would be upgraded from that of native informant to co-curator.

Indigenous cultures in a global world

This section does not purport to analyse and assess in detail the impact of global information technologies on Indigenous cultures. It is appropriate, however, to situate projects aiming at placing Indigenous cultural content online in the context of globalisation and the fight for rights (human rights, land rights) and identity. Indigenous communities in Australia and around the world are building systems with

a variety of names and catch phrases: virtual keeping place, Indigenous knowledge centre, virtual camp fire, digital archives, cultural networks, to name a few ([ABC], 2003; [ARA], 2003; [Yarrabah], 2003). All share the common feature and goal to store and preserve, in a computer system, intellectual capital that has been held previously by people and to repatriate, somehow, resources (about the culture and community) held in museums, agencies, and private collections.

Most Indigenous communities in Australia have experienced various degrees of destruction of their traditional knowledge transmission systems. Collectively, they have endured being objectified, classified and judged. While this experience of vulnerability may have prompted the desire to preserve culture using all means available, there is also a strong desire expressed by communities to exercise control over their heritage and its representation. According to Smith (2001), the struggle for control over cultural representation is now at the heart of the preservation agenda.

Threats and opportunities in equal measure

Smith and Ward (2000) remind us that the process of globalisation began in the West and has mainly fostered the expansion of Western ideas, values, lifestyles and technologies. For Indigenous people, globalisation threatens to complete the process of colonisation that began 400 years ago. Globalisation also constitutes an unprecedented opportunity for Indigenous empowerment.

Global technologies may well deliver traditional cultures to a wider audience, with the possible result of a wave of support for their struggle. Equally, Indigenous communities can foresee the risk of yet another round of dispossession, loss of control over their identities and their cultural properties. On the Web, everything is available, for free or for sale. Will a borderless world still have room for local identities? Will global technologies empower traditional communities to communicate and reinforce

their sense of self through the building of wider networks? Can the inequity of access to technology be turned on its head to allow a greater level of participation in the political process? What will be left of Indigenous systems of knowledge if information is readily available to all?

Social movements (including Indigenous groups all over the world) are using ICT as part of a political process to advance the recognition of their human rights. Havemann (2000) notes the emergence of an ICT-assisted politics of rights among Indigenous people worldwide. First Nations have invested massively in ICT "to build sites of counter-hegemonic power which give unprecedented exposure to their politics of naming and shaming to reclaim their traditions and lands through the assertion of rights" (p. 21). Similarly, Smith (2001) advances that "Networking has become an efficient medium for stimulating information flows, educating people quickly about issues and creating extensive international talking circles. Building networks is about building knowledge databases which are based on the principles of relationships and connections" (p. 156). Smith (2001) and Havemann (2000) seem to agree that networking by Indigenous people is a form of resistance. Looking back at the introduction of TV in remote communities in the 1980s offers an appropriate point of illustration of this sense of fear and expectation. It is also a base from which to look back at the way communities have tamed the technology and to assess the impact on their lives.

Broadcast media and the politics of knowledge

In the early 1980s, Michaels (1986) studied the introduction of broadcast television in Central Australia and its subsequent 're-invention' by the Warlpiri. His initial concern was "what problem do mass media pose to Aborigines?" and "what will television do to Aboriginal culture?" (p.129). Michaels asserted that mass media

always carry the risk of subverting the culture in which they are introduced, because, for example “mass media are logically and practically the inverse of the personal Aboriginal information exchange system” (p. 5). It is therefore the responsibility of the person introducing the technology to ensure it does not harm the local ways. This is achieved by taking into account “traditional forms” (p. 3). The essence of the ‘traditional form’ can be found in a good understanding of the Indigenous information management tradition, which de-emphasises material wealth, and values information.

In most Indigenous societies, information is personal property and stored mentally. Dances, designs, stories and songs are all formats for storing information and for displaying it in ceremonial and educational settings” (p. 3). Michaels emphasises that “knowledge is the currency of Aboriginal life” (p. 2). He goes on to explain that “Knowledge of the Law includes secret and public components” (p. 4). Further on, he remarks “Rights to secrets are accessible on the basis of locality, gender, kinship, descent categories and age. In face-to-face communication, information access can be differentiated as right to hear (see), right to know (own), right to speak (perform or paint) (p. 4). Rights of access are usually highly normalised (although they fluctuate) and stories can have versions. Michaels also notes “What is secret in one community may be public in another. Only senior male or female owners of information may determine in each situation what can be revealed and what must be concealed” (p. 4). As a result, any attempt at unleashing freedom of speech can have destructive consequences.

Rose (1996) sums up the ‘politics of knowledge’ in the Aboriginal context as “Law belongs to country and to people. It is embedded, of course in society and culture, and it is intellectual property, which is not freely available to all. Essentially, if knowledge is constituted as evidence of relationships among persons and between

persons and country, then it is most assuredly not available to all and sundry. Such a system is subverted through any form of ‘freedom of information’. If there is one thing that is absolutely not free, in Aboriginal land tenure systems and in Aboriginal politics, it is knowledge” (p 32).

While traditional knowledge systems are usually characterised as localised, personal and restricted, Michaels notes that broadcast systems make information equally accessible to audiences everywhere, instantaneously, and at no apparent cost. To paraphrase Mortimer (2000), the Internet is about maximum access for a maximum number of people; Indigenous knowledge is about restricted access for authorised people. These identified contradictions lead Michaels (1986) to foresee five major types of threats to the Aboriginal tradition, if the medium is not customised to suit the Indigenous context. They include usurping the prerogative of senior people, challenging to the localism of knowledge that is the basis of autonomy and (in the case of traditional content) of the exchange system and the violation of mortuary rules. Since “social structures and speaking rights enforce the status of Elders by according them singular authority” (p. 130), all novelty, outside the control of senior members of the community is threatening. Capturing stories and ceremonies on a storage medium is also ripe with contradictions. Any mediated storage or retrieval system is at risk of being construed as an external, archival, impersonal authority that may challenge the final authority of Elders or the Law. The ‘authoritative’ if not ‘definitive’ version of a story is held by Elders and may evolve as generations re-tell it and adapt it. The medium can only capture a version in a moment in time. To an extent, storing for preserving runs against the principle of living, self-perpetuating cultures. A similar concern has been expressed by Merlan (2000) with regards to producing information about Indigenous cultures for public consumption. She

remarks on the incongruities of producing enduring representation for the wider public, when, in reality, “the vitality of tradition depends upon a degree of instability and constant readjustment of it in living practice” (p. 25).

Adopting and adapting local forms

Batty (1993) has conducted research among the community of Ernabella in Central Australia. His work analyses how Ernabella TV (ETV) has gradually become pivotal to cultural life in Pitjantjatjara Lands. He recounts how people asked that ceremonies and other items of insider’s knowledge be recorded for future reference. Some of these programs have been stored, but not broadcast, and can be used for instruction of young men and women. The choice of a simple video technology has also allowed the Ernabella community to retain complete control over all aspects of production, without having to rely on experts and technicians from outside the community. Batty attributes the success of the ETV experience to the fact that the community did not reject the technology, rather it became familiar with it and sought ways of adapting it to local use. But he also stresses the singularly strong position of the community, with its secure tenure over land, majority population and its strong connection to its cultural base.

In July 1998, Buchtmann (2000) travelled to the Warlpiri lands to report on how the communities had adopted modern communication technologies and to see if there had been social changes as a result. Buchtmann found that, overall, “traditional culture and social practices have been mainly enhanced by the new technology, which has helped restore, and possibly improve traditional communication” (p. 71). Walpiri media has done much to preserve culture, but also has supported health education campaigns, provided employment opportunities and entertainment. She concluded that “the use of modern media could have undermined the social structure of Warlpiri

society, yet there is strong evidence the Elders ultimately still control the broadcasting through the Warlpiri Media Association even though younger adults broadcast" (p. 71). Buchtmann points out that "Indigenous broadcasting is not a linear evolutionary model from oral tradition to print to electronic media" (p. 71). Rather, Aboriginal communities have integrated the new technologies into their traditional practices to re-establish some of their traditional communications and to establish a link with non-Aboriginal Australia.

Strengthening the Law, gaining respect from others

There are multiple and often conflicting agendas driving the revitalisation of interest in Indigenous knowledge and its preservation, the world over. One of them is clearly articulated in a report from the Canadian government: "Preserving Indigenous knowledge will also contribute to the cultural and political goals of self-identity, self-reliance (specially the ability to support traditional lifestyle), and self-government by creating a strong, on-going, appreciation within the community of its history and its roots" (Brascoupe & Mann, 2001, p. 6).

In Australia, the Native Title process has forced communities to openly articulate identity in order to secure claims over land (Byrne et al., 2001; Harrison, 2000; Jacobs, 1988). The 2001 State of the Environment report acknowledges that Indigenous communities have to make difficult choices between maintaining secrecy over heritage information or sharing it ([SoE], 2001). Security, trust and certainty about how the information is going to be used will inform community decision on matters such as how much to share and with whom. Indigenous communities are usually keen on educating visitors about their Country, in the hope that teaching outsiders will lead to greater appreciation of culture and values. Strang (1997) reports that people at Kowanyama regard tourism as an avenue for information to be

disseminated to white Australians. Linking with white Australia and seeking respect through education seems also to be the prime motivator for an exhibition like "Pathways" held at the Australian Centre for the Moving Image (ACMI) in Melbourne that introduces the Ngarinyin culture of the Kimberleys ([ACMI], 2003).

Bolton (2003) notes that Aboriginal communities of northern and western Australia first focused their effort on setting up Keeping Places, where objects are kept until needed for use. She describes a more recent shift towards producing display, mostly of objects and photographic materials, designed largely for visitors. She also remarks that communities where objects are still being made are now showing more interest in historical materials, namely archival photos and photos of living people. Control over heritage and cultural representation touches on many connected domains, such as the updating of the Australian (and International Law) to protect adequately Indigenous Cultural and Property Rights (ICPR) (Janke, 1998; Mansell, 1997). Control over heritage (material or otherwise) is also linked to Land Rights and the struggle for self-determination. The theme report on "Natural and Cultural Heritage" produced for the State of the Environment report states that ultimately, "the ideal way for Indigenous communities to maintain control over their heritage is to have ownership of their lands" ([SoE], 2001, p. 120).

A sustainable proposal?

In Smith and Holland's model (1999), the collective is to be directed and shaped by information specialists (see Figure 1). Smith and Holland foresee the need for both a curator and an archivist, with the task to create the database and its profile, solicit materials, appraise them against collection guidelines, register and catalogue the digitised content and create content by way of online exhibitions, educational programs and various flow-on products. Technical support may also be needed to

maintain continuity of service. The mediation of information specialists, often non-Indigenous may be perceived by Indigenous communities as an impediment and a cost they can ill afford. The Quinkan Matchbox Project as a whole is taking responsibility for building the system and this research in particular is looking into the best way of profiling the future content, but ongoing funding, training and support will be needed if the collective is to be viable. Of equal importance is sustaining community interest in the collective by launching curatorial and various content producing initiatives.

Worcman (2002) asserts that one of the great challenges for digital inclusion is to create channels allowing cultural digitisation projects to be self-sustaining. She offers that "Partnerships between the communities and universities and training members of the communities to be able to use digital technology themselves could be analyzed as possible ways of creating sustainable digital resources" (Challenges section). Bolton (2003) comments that the fluctuations of interest in community museums reflect a political reality as "the establishment of a museum or the return to it of Aboriginal objects asserts Aboriginal control over Aboriginal identity" (p. 47). Once this is realised, the communities may not be interested in pursuing an engagement with the objects based on museological preoccupations. Smith and Holland's model suggests that trained information specialists should be employed to maintain the content and infrastructure of the collective.

Mortimer (2000) has described how many Australian schemes designed to provide Internet access to Indigenous communities have promised more than they have delivered for lack of follow-up. In her experience, local technical support and advice to ensure continuity of service is critical as problems have often resulted in inhibitions or discouragement. For those communities who have chosen to have a

Web presence, training in Web development and maintenance is an essential part of the follow-up process.

Commenting on the successful take up of television and production material at Ernabella, Batty (1993) praised the community's deliberate choice of a simple, easily learned and low maintenance technology. If culture is 'in the doing', interaction with the system should take precedence over third-party mediation and limits imposed by the technical environment.

Community benefits

Worcman (2002) warns of the dangers in placing too much faith in all technical solutions. She is confident that "projects that integrate communities, memory, and digital technology can have a measurable social impact on communities" and that recording oral tradition will assist in preserving the community's history (Social impact section). Still, she asks: "But preserved for whom? How can repeating the colonialization and appropriation of a group's culture, such as that which occurred previously with physical resources, be avoided when its knowledge is being recorded for the virtual world?" (Digital Technology and Social Inclusion section). Worcman is also concerned with the power relationships in a group that may lead to individuals constructing the history of the group or replicating 'official' history. For Worcman, too many projects are initiated in the belief that digital inclusion will result in social inclusion: "to merely digitize the artifacts and historical narratives of communities does not guarantee social inclusion. On the other hand, to simply distribute computers among communities (Indigenous and others) does not guarantee digital inclusion" (Social impact section).

First, there needs to be a deeper reflection on ways to make computers and their use meaningful to the people who will be using the computers. According to

Worcman, “communities need to be engaged in the digitization of their own stories as a means of social affirmation. It is also critical that communities feel the “need” and/or have the will to publicize and integrate their cultures” (Social impact section). She suggests “the most important factor of the digitization project is not the creation of the “digital collection“ as such, but the group's engagement in the process that motivates new generations to value their history” (Challenges section). Edwards (2003) argues that photographs or films that were produced as colonial documents and became ‘ethnographic’ records become family, clan or community history once repatriated. While they may be returned to the same locations, they are returning to very different social relations. Edwards is adamant that “communities are faced with what is known to them from their own ways of remembering, through the eyes of an outsider, with very different resonances” (p. 86).

Commenting on ScreenSound Australia’s Indigenous material policy, Saunders (2002) advanced that repatriation of cultural material, for all its feel good factor, may in some cases tear communities apart. Saunders describes the case of communities that have developed or redeveloped systems outside materials held in collections and absent for over 100 years. Their return may have a destabilising impact.

Addressing the World Archaeological Congress on Aboriginal perceptions of the past, Creamer (1990) stated that the past cannot be controlled, reconstructions of it can be used to achieve present needs and aspirations. A digital archive cannot be a replica of traditional systems of knowledge. At best, it may become a complementary way of strengthening identity. In addition to this endeavour, communities may still feel the need to offer outsiders a window into their world. According to Worcman (2002), this need may have several motivations. A typical one is explicitly stated by

Wabua Xavante on the Ideti Website: “No one respects what they do not know. We must show the whites who we are, the strength of our culture. Only then will they respect our rights, because they'll understand and admire what we've got” (Worcman, 2002, Social impact section).

CHAPTER 3: METADATA AND INTEROPERABILTY

Smith and Holland (1999) have indicated that accessibility and compliance with emerging standards for databases and networks are at the core of the digital collective project. For Lee (2000), the role of the Information Retrieval System (IRS) is to support navigation across collections and across levels of access. But the IRS is only going to fulfil these tasks if the resources are described with quality metadata. In the collective model, users are also contributors. It is expected that they will contribute their own material and enough metadata to facilitate the identification of the resource. Thomas and Griffin (1998) have described the lack of incentive for resource creators to provide companion quality metadata for the Internet. Even in institutional settings, quality metadata can be difficult to extract from authors. Greenberg et al. (2001) have surveyed the (Dublin Core) metadata produced for the National Institute of Environmental Health Science (NIEHS). Their findings show that resource creators are the best placed and the most willing to contribute best-intentioned metadata, but they will only do so if the input form is simple, intuitive and contains prompts and help files that will guide them through the process.

Expanded opportunities for use and access

Metadata consists of structured, standardised descriptions of resources, whether digital or physical ([NINCH], 2002). Gilliland-Swetland (2000) proposes to think about metadata as "the sum total of what one can say about any information object at any level of aggregation" (p. 1). The purpose of these statements about information objects is to assist in the discovery, retrieval and use (or re-use), management and exchange of these resources (Hillmann, 2003a; [NINCH], 2002). It may also be useful to look at metadata as cataloguing by another name (Hillmann, 2003b)

There are several categories of metadata, serving functions other than resource description: structural, administrative, preservation and technical metadata (Gilliland-Swetland, 2000). Descriptive metadata assists users in resource discovery and identification. Administrative metadata helps collection managers keep track of objects for rights management, preservation and version control. Structural metadata describes interrelations between objects (for instance a journal title and its volumes and issues) or inside an object (for instance, the chapters of a book) ([IMLS], 2001). The underlying data structure of the collective model described by Holland and Smith (1999) relies on descriptive (and structural) metadata standards. Categories of metadata frequently overlap as there are no clear boundaries between element sets and their functional attribution. Most metadata sets serve one (and sometimes all) functions described above, with various degrees of precision and detail.

The features of information objects that can be reflected in metadata are of three main types: content, context and structure (Gilliland-Swetland, 2000). Content relates to what the object contains or is about, and is intrinsic to an information object. In a library catalogue, content would be described in fields such as Title, Subject or Description (Abstract). Structure relates to the formal set of associations within or among individual information objects and can be intrinsic or extrinsic. Structure has become increasingly important in the technical or machine-readable environment. The more structure is provided for an information object, the more amenable it becomes to searching, manipulation and interrelating with other information objects. Context is associated with the "who, what, why, where, how aspects of the object's creation" (p. 1). Context has been the main concern of cultural heritage professionals. Context information is essential in cultural heritage work as it assists in preserving the evidential value of records (and artefacts). It also supports the authentication and

interpretation of resources. Without context, museums are only registrars of 'silent objects'. Context and interpretation give them life by making explicit "the interrelations between objects, collections, people, places, events, movements" (p. 10).

Context and authentification are only two of the many returns afforded by carefully crafted metadata. Gilliland-Swetland cites 'increased accessibility[7]' and 'expanded use' as some of the immediate rewards. Networked resources described using the common language of metadata become more easily accessible to the general public as they are free of the administrative and management constraints imposed on physical resources (Gilliland-Swetland, 2000; Lagoze & Fielding, 1998; Lee, 2000). The metadata can be aggregated without the need to aggregate resources. Thus, resources held in various locations can be searched from a single access point. Equally, resources managed as part of distinct sub-divisions can be searched as single collection entities. This, in turn, supports 'expanded use' as economic and geographic barriers to access are removed.

Access and use of cultural material are vital to the cultural revitalisation of communities (Fforde et al., 2002; Peers & Brown, 2003). People in remote Australian Indigenous communities, however, can ill-afford the cost of travelling to the various locations where their materials are held. The majority of communities cannot support the cost of repatriating all materials 'in Country' and maintaining a Keeping Place. The principle of expanded use would help realise, in part, the goal of promoting

[7] The term used here does not describe "Web content accessibility" as defined by W3C's Web Accessibility Initiative (WAI), which promotes a high degree of usability of the Web for people with disabilities.

access to cultural material without imposing the cost of supporting a cultural institution.

Expanded access and use creates the challenge to make resources intellectually accessible to an extended (and often undefined) user base. Metadata offers a flexible platform from which to tailor site searching, browsing and navigating, and displays of search results, to suit user needs (Hearst, English, Sinha, Swearingen, & Yee, 2002). Digital technologies have allowed the creation of digital surrogates of objects in many formats and resolutions. Metadata also supports efforts to manage 'multi-versioning' by providing, among other things, a way of relating the many instantiations of an object to the parent object (be it physical or digital).

As digital objects proliferate freely and access to resources improves, misappropriation and misuse of Indigenous cultural materials continues unabated[8]. The Indigenous world is filled with stories (and court cases) of traditional motifs finding their way from images on the Web to tee-shirts on market stalls without any permission or benefits to the communities of origin. Restricted materials are often made accessible to all, at all times, irrespective of traditional cultural restrictions. The House of Aboriginality project is one of several projects documenting these abuses ([HOA], 2002).

Janke (1998) has documented the many instances where the laws protecting copyright and intellectual property rights fail to take into account the specificity of the Indigenous context. As a result, they also fail to grant adequate protection, ways to assert rights and avenues to seek redress. Complex layers of rights, including

[8] "Prince stole our culture: Aboriginals". The Age (2003-08-20). Online: http://www.theage.com.au/articles/2003/08/20/1061261182182.html

copyright control and other rights of access associated with resources, can be managed with metadata.

Dublin Core

The Dublin Core Metadata Element Set ([DCMES], 2003) is a set of 15 elements used for the simple description of a great variety of resources, generally networked. Baker (2000b) suggests Dublin Core is a grammar that allows for short 'pidgin' statements about information objects.

The Dublin Core Metadata Element Set is the result of a consensus between diverse communities and domains, such as libraries, museums, publishing, government, education, computer science all working under the auspices of the Dublin Core Metadata Initiative ([DCMI], 2002). The Dublin Core Metadata Element Set ([DCMES], 2003) has been developed as a simple set of elements, so that it would be accessible to information specialists and end-users alike, and maximise the discovery potential of a variety of resources. This minimal set has a 'grammar' that enables users to extend it to suit local implementation needs. The 15 DC elements are commonly grouped under three aspects of the resource they serve to describe (i. e., content, intellectual property and instantiation) (Hillman, 2001).

Modularity

The DCMES adheres to a number of basic principles shared by most metadata sets: modularity, extensibility, refinements and multilingualism (Duval et al., 2002). Modularity is "a key organizing principle for environments characterised by vastly diverse sources of content, styles of content management, and approaches to resource description" (Duval et al., 2002, Modularity section). This principle enables designers of metadata profiles to mix elements borrowed from established metadata sets to serve their own local implementation. For instance, cultural heritage projects usually

straddle several intellectual domains (libraries, museums, the environment, rights management) for which specialised metadata element sets or metadata application profiles already exist.

There is an inherent tension in the work undertaken by DCMI between simplicity and structure (Arms, 2000). Arms sums up this tension by describing, on one side, the ‘minimalist’ approach. This approach leans towards a simple set of elements and equally simple cataloguing rules. On the other side, the ‘structuralist’ approach favours more complex and more tightly controlled cataloguing rules. While the minimalist approach seems to support the widest adoption of metadata by lay users, it also opens up issues such as the trustworthiness of metadata (spamming) and search precision. The benefit of adhering to stricter cataloguing rules (such as using controlled vocabularies) is reaped in the way of increased search precision, but it is paid for ‘at the source’, in terms of time and specialisation of the metadata authoring workforce. Arms notes that DCMI’s current strategy is to retain both options (running more or less along the divide between DC Simple and DC Qualified), to suit the skill levels and budget of metadata users. Granularity is not just guided by technical or financial considerations. In the case of federated systems, the ability to pre-structure can be hampered by the incompatibility of the metadata contributed by participants.

Application profiles, syntax and semantics

Application profiles, syntax and semantics, and association models are some of the practicalities flowing on from the metadata principles described by Duval et al. (2002). No single metadata element set will be expected to always accommodate all the functional requirements of any metadata application (Duval et al., 2002; Heery & Patel, 2000).

As the Web removes the physical and intellectual boundaries that have traditionally stood between resources, metadata repositories have to reflect the hybrid nature and varied origin of resources. Elements borrowed from various sets can be combined in a metadata application profile. An application profile is an assemblage of metadata elements selected from one or more metadata schemata and combined in a compound schema. Application profiles provide the means to express principles of modularity and extensibility. The purpose of an application profile is to adapt or combine existing schemata into a package that is tailored to the functional requirements of a particular application, while retaining inter-operability with the original base schema (Duval et al., 2002).

Heery (2000) points out the difference between a namespace schema and an application profile schema. She defines a namespace schema as a means of declaring (or registering) standard element sets or new elements. The modularity principle makes the element set amenable to be mixed with elements borrowed from other namespaces. The mixed and matched elements are optimised for a local application, and the resulting application profile is a way of declaring what the local application needs to understand. While namespace schemata are authoritative declarations of terms, application profiles are declarations of usage (Heery & Day, 2002). For Baker (2000b), application profiles "re-use semantics from namespaces and repackage them for a particular purpose" (Some Definitions section). DC Working Groups have recommended some domain-specific application profiles, and the DC Usage Board has endorsed some such as DC Education, DC Library, or DC Government ([DCMI-WG], 2003).

Schemata are defined as "a formal grammar for a metadata element set expressed in a formal schema language" (Duval et al., 2002, Glossary section),

usually XML or RDF. A schema provides an authoritative declaration of terms. It indicates the semantic relationships between terms and supports the unique identification of terms (Heery & Day, 2002). Most importantly, this declaration is machine-readable. XML “is the idiom of choice for the encoding and exchange of structured data” (Duval et al., 2002, Syntax section). The Resource Description Framework ([RDF], 2003) is constrained XML and works as an additional layer on top of XML that is intended to simplify the reuse of vocabulary terms across namespaces by providing additional structure (Duval et al., 2002). Full XML carries additional information about both the internal structure of resources and their inter-relations in a machine-readable syntax. While XML syntax is so open it requires that structure is pre-defined in each case, RDF syntax is constrained and so, by being able to rely on its structure, it adds extra freedom. In her justification for using RDF syntax for the Quinkan Matchbox, Nevile asserts that the freedom of making association between objects ‘on the fly’ should be compatible with the kind of cultural ‘doing’ of Indigenous people. She also notes that it relieves system designers from the task of pre-structuring their resource descriptions to the needs and expectations of an undefined and unpredictable user base (Nevile & Lissonnet, 2003).

There are many ways of associating resources and metadata. Metadata can be embedded in the resource itself, in between the <head> tags of Web pages. Associated metadata can be linked to the resource and managed separately. Metadata can exist independently from the resource. The Education Network of Australia ([EdNA], 2003) is an example of metadata repository operating as a Union catalogue of educational resources. EdNA generates metadata to describe educational resources available on the Web. While EdNA has no control over the lifecycle of these resources, users can search the descriptions stored in the EdNA repository to identify

and locate a wide range of local and international resources. EdNA holds and manages these records, created and classified according to Australian education criterions. It is possible to envisage that metadata could be used to give Indigenous communities a voice for describing resources produced by, often unauthorised, outsiders. Third-party metadata can be created that describe, rate, validate (or not) these resources and re-classify them according to a local organisation scheme.

Inter-operability

Many metadata-based systems choose to store the metadata centrally, while the resources can be kept locally (distributed). Federated or heterogenous systems are co-operating systems in which components are designed and operated autonomously (Paepcke et al., 1998). At the heart of federated systems lies the challenge of creating sufficient common ground to be able to exchange, search and display resources that have been described to suit the local requirements of the federation's members. Inter-operability is what will bring these heterogenous components together in a seamless service.

Based on their experience with the National Science Digital Library (NSDL) project, Arms et al. (2002) have defined “a spectrum for inter-operability” covering three levels of agreements between participants. “The goal of inter-operability is to build coherent services for users, from components that are technically different and managed by different organizations. This requires agreements to cooperate at three levels: technical, content and organizational” (Arms et al., 2002, Inter-operability section). Technical agreements cover formats, protocols and security systems, and facilitate the exchange of messages. This would include, among other things, agreement on syntax such as the use of shared XML schemata for encoding the records. Organisational agreements cover the ground rules for access, preservation of

collections and services, payment and user authentication. Content agreements cover the data and metadata, and include semantic agreements on the interpretation of the information.

Miller (2000) sees inter-operability in terms of ‘flavours’. While technical and semantic inter-operability rank high on his list of flavours, Miller also adds a more human component, which includes political (or human) inter-operability, as well as inter-community, legal and international inter-operability. Technical and organisational agreements are out of the scope for this research. Content agreements have been identified as one of the cornerstones of the ‘digital collective model’ (Holland & Smith, 1999).

Figure 3. A possible vision for inter-operability. Adapted from Tennant (2000).[9]

[9] In this illustration of inter-operability, the user is sending a query via a single query interface. The query is sent on to an array of inter-operable repositories. The retrieved set is displayed to the user as the result of a single search via a style sheet.

The DCMI Glossary's defines 'inter-operability' as "the ability of different types of computers, networks, operating systems, and applications to work together effectively, without prior communication, in order to exchange information in a useful and meaningful manner. There are three aspects of inter-operability: semantic, structural and syntactical" (Woodley, M, Clement, & Winn, 2003). According to Duval et al. (2002), the three aspects are mutually dependent for effective inter-operability. "Semantics is about meaning; syntax is about form. Agreements about both are necessary for two communities to share metadata. Two communities may agree about the meaning of the term title or creator or identifier, but until they have a shared convention for identifying and encoding values, they cannot easily exchange their metadata" (Syntax section). Duval et al. also mention 'content vocabularies' as another requirement for inter-operability. Syntactic and semantic agreements do not need to cover all the components of inter-operating schemata. Inter-operability can occur when only these elements for which values are to be exchanged can be mapped to one another.

Cultural heritage information is by nature cross-domain. Large cultural heritage groups (museums, libraries, archives) often work together to devise DC-based schemata to describe the resources they intend to pool together. The Colorado Digitisation Project brings together the collections of 23 institutions spread over 4 US States. Its metadata Working Group ([WSDSG], 2003) recommended the adoption of DC as the standard to support inter-operability between participants. The group recognised that it adequately described resources found in the library, archives and museum communities and provides the broadest level of commonality of elements, flexibility and application among the institutions. The groups felt that DC and its cross-walks paved the way for inter-operablity.

The process of cross-walking (also referred to as metadata mapping) was born out of the new imperative to grant universal access to resources. To achieve this, descriptions have to be easily translated from one metadata standard to the next. “A cross-walk is a specification for mapping one metadata standard to another. Cross-walks provide the ability to make the contents of elements defined in one metadata standard available to communities using related metadata standards.” (St Pierre & LaPlant, 1998). Cross-walks and transformation rules are used when agreement between standards (or schemata) could not be planned. Thus they are a *post-hoc* means of achieving inter-operability and information exchange, but they are rarely as smooth and lossless as pre-planned agreements.

Dublin Core has been mapped to a large number of other metadata standards. These cross-walks are maintained by individuals or agencies, with a responsibility to monitor the evolution of the source and the target standard (Day, 2002; Harpring, Woodley, Gilliland-Swetland, & Baca, 2000). A complete cross-walk specifies the correspondence (or semantic mappings) between elements. It also indicates rules for conversion of the metadata. The main objective is “to convert the metadata record content compliant to a source metadata standard into a record whose contents are compliant with a target metadata standard” (St Pierre & LaPlant, 1998, Crosswalk section).

The NSDL project identified considerable differences in the syntax and the semantics of the metadata created by the participating collections. In order to maintain consistency across the NDSL service, all item-level metadata records were ‘normalized’ by metadata cross-walks to Dublin Core (Arms et al., 2002). Some issues of semantic inter-operability can be dealt with at international level by standards organisations.

Source schema label	DC element	Explanation	Example in HTML
Photographer	Creator	Indicate the person, people, company, institution, etc responsible for the existence or discovery of the object. Standard format is last name, first name This field should not be mapped if the value is "?" or "unknown"	<META NAME="DC.Creator" LANG="en" CONTENT="Citizen, John">

Table 1. Example of cross-walk from 'a schema' to DC.

Arms notes that "the traditional approach to inter-operability is for all participants to agree to use the same standards. If each service implements a comprehensive set of standards then inter-operability follows." In practice, however, inter-operability through comprehensive standardisation is hard to achieve (Arms et al., 2002). In their white paper on cross-walking content metadata standards, St. Pierre and LaPlant (1998) point to the terminology drift that affects many metadata integration projects. Even though metadata designers may read from the same specification documents and always purport to apply standards, a careful examination of their implementation practices will often reveal a vast range of interpretations of the semantics of metadata elements (Currie et al., 2002). A commonly highlighted example is that of repositories using different labels for the same thing (creator, author, composer) or using the same label for different things (typically, different kinds of Date) (Tennant, 2000).

St. Pierre and LaPlant (1998) call for an improved harmonisation of metadata standards. The first step should be taken towards extracting "the common terminology, properties, organization, and processes used by many of the metadata standards, and create a generic framework in which to develop new or revise existing metadata standards" (Introduction section). Although cross-walks support semantic

inter-operability, they have limitations. Though they may be seen as “the path to universal access”, Woodley (2000) warns that a one-to-one correspondence between the fields or data elements in different information systems is a rare occurrence. Semantic inter-operability is often reached by sacrificing data specificity (or granularity) for the sake of compliance.

Work can also be undertaken at inter-community level to try and smooth differences in description practices, terminology or perceived user needs. As a strategy, Tennant (2000) suggests focusing on common problems and working towards customisation. The outcome for many metadata integration projects is usually the focus of best practice documents. These documents contain the definition and scope of each element for the particular application, usually as a list of allowed values as well as guidelines to ensure consistent data entry ([CIMI], 1999; Waibel, 2002; [WSDSG], 2003).

At the mid-point between international and inter-community inter-operability stands the current push for the adoption of formal registries as ways of declaring, sharing and re-using application profiles. Heery and Day (2002) also advocate the adoption of best practice in schema definition. In their view, before schemata can be shared, they need to express, in a comparable way, which standard terms are used in an application, how terms are adapted or used locally and other related usage notes. The registry process bears similarities with the process of sharing data dictionaries between databases.

Heery and Day (2002) lament the fact that standards are made public, but that local variations in implementations are not. This, in turn, leads to a frenzy of schema creation, complete with unnecessary duplication of effort and uncontrolled proliferation of local practices. They promote the use of a common registry as a kind

of schema stock exchange that would also contribute to the harmonisation work done by the standards community.

A metadata schema registry is defined by the DCMI Glossary as a "publicly accessible system that records the semantics, structure and interchange formats of any type of metadata. A formal authority, or agency, maintains and manages the development and evolution of a metadata registry. The authority is responsible for policies pertaining to registry contents and operation" (Woodley, M et al., 2003). In even simpler terms, they operate as databases of schemata and should support the automated process of sharing application profiles (Wagner & Heery, 2002). The registry becomes the reference point for namespaces, where authoritative information is kept about names, definitions and usage. It is also the place where agencies can maintain cross-walks and metadata designers can monitor the evolution and the alignment of elements from different standards.

A registry would become a showcase of real-world examples of MAPs. By encouraging disclosure of schemata and making them easily searchable, registry advocates hope to promote effective re-use of profiles and constrain the proliferation of schemata that has become counter-productive to inter-operability (Duval et al., 2002; Heery & Day, 2002).

Simplicity from underlying complexity

All these remarks and conditions seem to take the MAP design work far away from DC's initial ambition to create a simple device to facilitate resource description and discovery. The idea is that simplicity is often engineered from underlying complexity (Bearman & Trant, 1999). "Simple resource description was among the primary motivations for embarking on the development of the Dublin Core. The idea of an intuitive semantic framework that anyone –- from creators of the work on the

one hand to a skilled cataloger on the other –- could use to describe resources is appealing. The modeling described in this paper seems to fly in the face of this goal of simplicity. It is often the case, however, that simplicity can only be achieved through detailed engineering that helps to mitigate the underlying complexity of a problem. Lego ™ is child's play. Any three-year old can use them. But the inter-operability of Lego blocks across 6 decades (and that satisfying “click” as they snap together) is the result of precise engineering to tolerances that approach those necessary for internal combustion engines” (Bearman & Trant, 1999, Conclusions section).

Method

CHAPTER 4: METADATA FOR CULTURAL HERITAGE

Dublin Core, with its focus on resource discovery, does not cover the vast range of functions metadata can be applied to. It does not handle all of the information needed for museum collections such as management, documentation or rights management ([CHIN], 2002). Lightle and Ridgway of the Eisenhower National Clearinghouse (ENC) advise digital libraries to select the schemata that best reflect the nature of their resources and their cataloguing goals. A schema may be developed by cross-walking from one metadata standard to several others in order describe resources in rich ways and make them available through a variety of portals and search interfaces (Lightle & Ridgway, 2003). The extensibility principle and extensible architecture of DC allows communities to develop their own extensions of DC for discipline specific purposes. This is done through the mechanism of application profiles (Heery & Patel, 2000).

In their introductory guide to metadata, the Canadian Heritage Information Network (CHIN), notes that communities often proceed in reverse, by developing discipline-specific standards (such as the CHIN Data Dictionaries) and then extract a subset of their data to map to DC elements ([CHIN], 2002). Alternatively, some designers consider the kind of functionality they want to offer users and tailor their metadata accordingly (van Veen, 2003).

In the absence of clear user requirements or collection boundaries, a review of standards in use in the cultural heritage and library domains, both in Australia and internationally, assisted in defining a set of base categories to create rich, interoperable and compliant descriptions for the Quinkan materials. Reviewing current standards in the cultural heritage domain was the methodology adopted in the initial phase of the Visual

Arts Data Service (VADS) in the UK (Gill, Grout, & Smith, 1997). VADS now provides access and preservation to UK-wide collections of visual arts digital resources. Gill used the standards review in 1999 again as a base to define a data set for the RLG Cultural Materials service. He surveyed the current descriptive standards in use across the spectrum of ‘memory institutions’. This review approach was partly motivated by the lack of available information about users' access points to cultural resources.

The RLG Cultural materials (Gill, 2002) catalogue is very similar in spirit to what the Quinkan Matchbox (QM) catalogue seeks to achieve. It is “a virtual collection of cultural works and artefacts from RLG member institutions, in the form of an online database of digital multimedia representations (or “surrogates”) of works and their corresponding textual descriptions” (Introduction section). This collection receives contributions from an alliance of 50 member institutions made up of museums, libraries, archives, and historical societies (mostly based in the US with some contributions from Australia).

Gill (2002) compares RLG to a union catalogue in that it provides integrated access to dispersed resources. Gill remarks that the library community (from where union catalogues originate) has been well supported in this effort by the MARC family of standards for the description and control of bibliographic materials. In sharp contrast, cultural repositories do not share a common descriptive standard. In the cultural domain, there is, in fact, a plethora of descriptive models “that differ by institution type, collection type, curatorial methodology, level of detail and granularity, and intended applications and audiences” (Introduction section).

Gill remains an advocate of 'infodiversity' and states strongly the necessity of multiple views in the cultural domain. For Gill, "cultural infodiversity is the natural and appropriate outcome of diverse memory institutions documenting varied collections for different audiences and applications" (Gill, 2002, Introduction).

The following section is based on a review of the schemata proposed by a number of working groups related to the museum and heritage community. It describes some of the specific requirements and problems related to describing resources in the Quinkan context.

Standards Review

The Categories for the Description of Works of Art 2.0 (CDWA) were produced by the Art Information Task Force (AITF) at the J. Paul Getty Trust. They are guidelines for formulating the content of art databases (Baca & Harpring, 2000).

The Categories were devised with an academic and scholarly focus on art history. They serve to describe physical objects with great precision, including their curatorial history and all the related textual and visual documentation. The Categories are presented in a Core set, covering Object/Work, Classification, Titles/or Names, Measurement, Materials and techniques, Creation, Subject Matter Current Location and an expanded set. In their presentation of CDWA, Baca and Harpring (2000) specify that CDWA articulate "an intellectual structure for descriptions of objects and images: in this sense they constitute a schematic representation of the requirements and assumptions implicit in the practice of the discipline of art history" (Introduction section).

Information that is intrinsic to the object (description, measurements) is distinguished from information that is extrinsic. Extrinsic information is stored in

authority records (and recorded once only). Extrinsic information (akin to contextual information) covers persons, places, events related to the work. CDWA also encourages the use of controlled vocabularies for key information elements. The Getty Thesaurus of Geographic names ([TGN], 2000) is a registered encoding scheme for DCMES 1.1 for the Coverage element. The Art & Architecture Thesaurus ([AAT], 2000), also developed by the Getty organisation, is widely deployed by 'memory institutions' to describe both the subject and the type of their cultural materials.

Art history is not the prime focus of the Quinkan Matchbox. However, the CDWA offers a broad spectrum of requirements for documenting both physical objects (e.g., painting, artefacts) and their digital surrogates (photographs, thumbnail images) in a museum setting. It is also a useful base for a core set of elements specially dedicated to Physical Objects. The full set of CDWA categories offers a level of granularity in description that may not be warranted in the Quinkan Matchbox, but the hierarchical structure, coupled with DC's modularity, means that the level of detail of the Quinkan metadata application profile could easily be increased.

Gill (2002) also praised hierarchical structures of the CDWA set as being particularly well suited to XML encoding. These categories map to or are the basis for other metadata standards for describing works of art and material culture, such as the Art Museum Image Consortium (AMICO), The International Committee for Documentation of the International Council of Museums (ICOM-CIDOC), CIMI's Access Points, MDA's SPECTRUM and others (Baca & Harpring, 2000). CDWA has been mapped to USMARC, DC qualified and CIMI (Harpring et al., 2000). CDWA is also the base for several, more focussed data sets, such as Object-ID and VRA Core. The Visual

Resources Association Data Standards Committee expanded upon certain sections of the CDWA to formulate the VRA Core Categories. They are specifically designed "to facilitate the sharing of information among visual resources collections about *works* and *images*" ([VRA], 2002, Introduction section).

Object-ID is a small subset of the CDWA categories, developed to help identify objects for the purpose of protecting them as cultural property. Launched in 1997 by the Council for the Prevention of Art Theft, the Object-ID metadata standard is a core standard for the identification of art, antiques and antiquities. In the event of theft, Object ID is intended to allow the quick transmission of information about stolen objects among museums, police and customs agencies, the art trade and collectors ([Object-ID], 1999). The Council has published two other internationally agreed standards for the documentation of the cultural heritage: the Core Data Index to Historic Buildings and Monuments of the Architectural Heritage and the International Core Data Standard for Archaeological Sites and Monuments (Thornes & Bold, 1998). These standards are used for documenting archaeological, architectural, and movable heritage.

As with CDWA and Physical Objects, the Core Data Standard can be considered as a base for reflection on how to document archaeological sites in Quinkan Matchbox. The EPA's Indigenous Site Cards Database ([EPA-Qld], 2001) and the Australian Heritage Commission's Register of the National Estate ([RNE]) database exhibit many similarities with the Core Data Standard. They share a common emphasis on recording the geographical location and extent of monuments and sites, as well as an interest in recording information about legal preservation status and physical condition.

The now defunct CIMI Consortium (Consortium for the Computer Interchange of Museum Information) ([CIMI], 2002) produced research on Dublin Core metadata and its application in the museum context. Between 1998 and 2000, CIMI conducted the CIMI Dublin Core Metadata Test Bed designed to test two major sets of assumptions. At the beginning of 1998, Phase 1 examined the DCMES v. 1.1. Today this would be the equivalent of DC Simple. In the middle of 1999, the second test explored in depth the potential for a prototype qualification of the core fifteen elements as a mean to assist in the discovery of richer, more descriptive museum information ([CIMI], 2000). At the time, CIMI was concerned with DCMI's shift away from "fundamental high-level inter-operability" as it saw DCMI considering proposals to make the process of element qualification or extension a domain-specific activity. Such a 'liberalisation' was perceived by CIMI as a threat to cross-domain inter-operability. Phase 2 of the testbed revealed that, at the time, the DCMES was too focussed on the description of digital resources and did not cater sufficiently for museums' need to describe physical objects. CIMI also expressed doubts as to the ability of Dublin Core, a description standard too deeply embedded in the Bibliographic tradition (as it was then), to adapt to the specific needs of the museum community. For instance, the Date element (unqualified) could not reflect the multiplicity of dates associated with the life cycle of a Museum object that are essential to its management (date of creation, collection or acquisition).

CIMI commented that "the museum community has a need to provide contextual information, about people, places and events and the relationships between them and objects, artefacts, and specimens (collectors, painters, engravers). Relationships that articulate ideas about how artefacts were used, by whom and for which purposes are a

key component of how museums describe and interpret objects and why they are collected and preserved" (p. 15). For CIMI, the need to provide contextual information was in direct conflict with DC's erstwhile dumb down and 1:1 principles that worked to exclude it. In the conclusion to the report, CIMI encouraged the use of the DCMES for coarse level inter-operability, but "in conjunction with a domain specific model that can be used between museums sharing rich, complex records" (p. 18).

Much of what CIMI reported is still valid, although Dublin Core has undergone significant changes and many of the short-comings reported in 2000 have since been overcome. In particular, CIMI's experiment relied heavily on the dumb-down[10] principle for inter-operability. This rule has been largely supplanted by cross-walks and applications profiles.

The AGLS Metadata Standard ([AGLS], 2000) is a set of 19 descriptive elements used by Australian government departments and agencies to describe their resources and services. It is based on the DCMES with the addition of the elements, Function, Availability, Mandate and Audience. AGLS is an Australian Standard and it is now the standard mandated for government departments and agencies. It was not designed with cultural heritage in mind. It is included in this review because a number of Australian cultural institutions under government authority have indicated their obligation to comply with AGLS.

[10] The principle is defined as follows in the DCMI Glossary: "The qualification of Dublin Core Elements is guided by a rule known colloquially as the Dumb-Down Principle. According to this rule, a client should be able to ignore any qualifier and use the value as if it were unqualified. While this may result in some loss of specificity, the remaining term value (minus the qualifier) must continue to be generally correct and useful for discovery. Qualification is therefore supposed only to refine, not extend the semantic scope of an Element" (Woodley, M et al., 2003).

Specific requirements of cultural heritage information

Roles

The Library and Museum communities are interested in recording the role played by a person in the creation of cultural materials (illustrator, sculptor, engraver and more). The DC-Libraries Working Group and CIMI have proposed the inclusion of Roles as semantic refinements for Creator, Contributor and possibly Publisher ([CIMI], 2000; Guenther, 2002). At present, DCMI does not have recommended qualifiers for the Creator and Contributor elements but recommends the use of application profiles for this purpose. At the time of writing, the method for using role values as element refinements is awaiting consideration by the DCMI Usage Board after recommendations are received from the DCMI Agents Working Group ([DC-Agents], 2003).

Biographical information

Recording biographical information about artists is another special feature of documenting resources in the cultural heritage domain. The boundary between empirical and interpretive statements about resources is rather tenuous. The CDWA provides an example of a data set where extrinsic or contextual information about resources is given as much attention as intrinsic information. As with roles, the issue is about structuring the data to be recorded. The J. Paul Getty Trust has developed the Union List of Artists Names ([ULAN], 2000) to serve as the authority for the Creator category. It contains more that 255,000 artists' names, complete with biographical and bibliographic information. Authorities are maintained separately from records, but are linked to them. This means they only need to be created and maintained once within the system. There is no mechanism to do this in the DCMES.

DCMI's Agents Working Group has been rechartered with the aim to develop a core set of metadata elements for unambiguously describing agents (people or groups) associated with resources. The work plan also includes the development of an identifier scheme to identify unambiguously a specific individual agent (Wilson & Clayphan, 2004). The draft proposal for people is very much inspired by the necessity of describing contemporary (living) agents, with its emphasis on location and contact. Such scheme could also be used in the rights area to describe rights holders. It bears similarities with the widely used vCard structure ([vCard]), but it is unlikely to support the recording of detailed biographical information about artist or cultures needed in heritage work. The DC-Agents Working Group also has concerns that privacy laws may forbid the collection (and the publication) of such personal information.

In the cultural heritage and library domains, many of the agents described are often historical figures (sometimes known only identified their place affiliation, e. g, "Master of Leyden"). The emphasis of the agent's description in this context moves away from contact and towards related dates and places, affiliation to language, ethnic or cultural groups, life roles and other biographical details (see Tables 3 and 4 below).

The encoding of the biographical details is also open to discussion. CIMI (2000) has rejected the use of a standard such as vCard "until it can be proven effective for accommodating the detailed information about people and cultures that museums require" ([CIMI], 2000, p. 17), although many other communities have found it a useful scheme. Creator, Contributor and Publisher data content can be structured using AglsAgent that draws heavily from the vCard structure: Personal Name, Corporate Name, Address, Contact, Jurisdiction, e-mail, sector. With their focus on contact details,

Agents and vCard are unlikely to fulfil CIMI's expectations for a rich structure for Authorities in the cultural heritage domain. The AGLS manual supplies this example of a typical AglsAgent -encoded entry:

```
<META NAME="DC.Creator"
SCHEME="AglsAgent"
CONTENT="corporateName=Attorney-General's Department;
contact=Native Title Division, Robert Garran Offices, National Circuit,
Barton, ACT 2600, phone: 6250 5540">
```

Table 2. Example of a data entry for Creator using AglsAgent as an encoding scheme.

The following table shows the far richer structures suggested by CDWA and SPECTRUM for information about people in the context of museums (Baca & Harpring, 2000; [MDA], 2002).

People (authorithy)	
CDWA	SPECTRUM schema

• name [core]
  • variant names
• dates/locations [core]
• birth date [core]
• death date [core]
  • earliest active date
  • latest active date
  • place of birth
  • place of death
  • places of activity
  • nationality/culture/race
• nationality/citizenship [core]
  • culture
  • race/ethnicity
  • gender
• life roles [core]
  • related people
  • relationship type
  • name
  • remarks
  • citations
	• complex type: people
	  • culture
	  • group
	  • linguistic-group
	• complex type: person
	  • address
	  • biographical-note
	• complex type: birth
	  • date
	  • place
	• complex type: death
	  • date
	  • place
	  • gender
	  • group
	• complex type: name
	  • additions
	  • forename
	  • initials
	  • note
	  • surname
	  • nationality
	  • occupation
	  • person-title
	  • reference
	  • salutation
	  • school-style

Table 3. Information about people structured according to the CDWA and SPECTRUM schemata.

Contextual information is not limited to people. CDWA and SPECTRUM have also devised a complex structure for Place that covers geographic coordinates, name variations, date (or date range), ownership as well as bibliographic reference.

Place (authorithy)	
CDWA	SPECTRUM

• place name [core]
  • variant place names
  • dates
  • earliest date
  • latest date
  • coordinates
• place types [core]
• related places [core]
  • relationship type
  • name
  • remarks
  • citations
	• complex type: place
	• complex type: coordinates
	  • qualifier
	  • type
	  • value
	  • environmental-details
	• complex type: feature
	  • date
	  • keyword
	  • system
	  • name
	  • name-type
	  • note
	• complex type: owner
	• complex type: reference
	  • number
	  • status

Table 4. Information about place structured according to the CDWA and SPECTRUM schemata.

Type and possible refinements

With the proliferation of objects in the digital environment, it becomes arduous to differentiate between originals and surrogates and to keep track of the generation levels of resources. Besser's diagram of the sheep and its image families illustrates this challenge. An original object may be related to an extensive family of versions and formats (Besser, 2002). Besser suggest that NISO's efforts to create a Technical Imaging Metadata Standard that incorporates 'change history' and 'source data' will deal in part with this problem.

Figure 4. Image families (Besser, 2002).

VRA 3.0's contribution is to suggest the values 'work' and 'image' to be implemented as additional values for Type. In the context of the *VRA Core 3.0*, a *work* is a physical entity that exists, has existed at some time in the past, or that could exist in the future. An image is a visual representation of a work ([VRA], 2002). CIMI also recommended the use of the Type element to differentiate an 'original' from a 'surrogate' ([CIMI], 1999).

For CIMI, the DCMI Type vocabulary failed to address the need of the museum community. CIMI proposed the addition of pairs of values to the type list to improve resource discovery. Organisations like AMOL follow the CIMI's Best Practice guidelines and use these values (B. Dewhurst, personal communication, 24 March 2003). For example, the values 'party' or 'place' are proposed by CIMI to describe people, places or organisations that would otherwise be classified as 'physical objects'. The second list of museum-related values for Type proposed by CIMI ('natural' or 'cultural') would be problematic to apply to Indigenous resources. Indigenous authors who have tried to explain the meaning of 'Country' as the location of culture have stressed that what is natural is (almost) always cultural.

The following examples, taken from CIMI's Best Practice Guide illustrate the use of the CIMI Type values ([CIMI], 1999).

For a painting: • image • physical object • original • cultural	For a photograph of a painting: • image • surrogate • physical object • cultural
For a mountain: • place • original • natural	For a building: • physical object • original • cultural

Table 5. Examples of data entry for DC.Type following CIMI's Best Practice Guide.

Type is a highly contended element. Other communities or specific projects have suggested the introduction of secondary value lists that would refine the original values of the DCMI Type vocabulary. For the Type element, AGLS introduces three qualifiers and their respective value lists: aggregation level (collection or document), category (service, document, agency) and document type list. The European Library application

profile ([TEL], 2002) uses DCMIType for “compatibility reasons” (Type section), but recommends an extended value list (TELType) “to prevent conflicts with other applications” (TELType section). TELType takes the values from DCMIType and adds others suggested by the holdings of the TEL partners like maps, music sheets or illuminated manuscripts.

Measurements

Measurements or physical characteristics of resources are of greater interest to museums than most libraries. Measurements or physical characteristics can be essential identifying information for physical objects. There are many ways of measuring an object, depending on its shape (length, diameter, circumference), whether it is on its own or part of a group, whether it stands on a pedestal and the pedestal is included or not, whether it is real size or reduced according to a scale. There are just as many measurement units (cm, pica, inch). The extent of recorded material is often expressed in footage and duration, and that of printed material can include the pagination or the number of volumes.

VRA defines Measurements as “the size, shape, scale, dimensions, format, or storage configuration of the Work or Image. Dimensions may include such measurements as volume, weight, area or running time. The unit used in the measurement must be specified” ([VRA], 2002, Measurements section). VRA suggests adhering to standards for data content. CDWA is even more specific, and suggests articulating Dimension around Extent, Type (of dimension), Value, Unit, Qualifier and Date, while DC is content with allowing free text notations.

CIMI (1999, 2000) had also suggested describing the Format of natural specimen resources with the terms “telescopic” and “microscopic”, thus indicating to the user that an instrument is required to access the resource.

Materials and technique

CIMI’s report (2000) pointed to DC’s bias in favour of describing digital resources. It also felt that the newly accepted refinements for Format (Medium and Extent) did not sufficiently separate “the properties of the resource from the physical characteristics of the resource” (p. 15). The Best Practice Guide (1999) recommends, that technique, material and medium should be added to Description, in contradiction with DC ‘s recommendation that it belongs to Format (medium).

Coverage

VRA offers a timely reminder that in the Cultural Heritage domain, matters of temporal coverage for a resource need to be expressed not just as dates or date intervals but also as terms, preferably selected from a controlled vocabulary. VRA’s element Culture and Style/Period cannot be confined to a strict date interval, and are expected to comprise entries such as “Italian Renaissance”, “Art Nouveau”, “Bronze Age” or “Aztec”. This is relevant to the Quinkan MAP as Australian Archaeological Periods are named differently from their European counterparts and have their own distinct chronology.

Dating cultural materials precisely is rarely possible. CDS and CDWA introduce the notion of data accuracy (or date type) and recommend various refinements for such data: date absolute, date earliest, date latest, or circa. The CDWA sample gives an example of this variety (see Table 6). It is also recognises that other calendar systems

exist and that dates expressed in systems other than the Gregorian system should be clearly so designated. Data entry guidelines will be required to assist users of the Quinkan Matchbox in formatting relative dates according to the chosen standards, so that they remain machine-readable.

- 1889
- 12 December 1991
- Christmas 1472
- before 952 BCE
- 1940-1949
- ca. 1537
- late 4th century BCE
- 17th century
- reign of Ramses II
- An II de la Republique (1794)
- illuminated 2nd quarter of 11th century, binding probably dates from 12th century
- printed in 1983 from a negative dating ca. 1960 (for photographs)
- 1372, reworked 1377-1379 (for a sculpture)

Table 6. A sample of Date/Coverage entries for cultural heritage artefacts suggested by CDWA

Towards a Quinkan 'data dictionary'

As noted by CHIN (2002), a common methodology for communities is to develop their own standards and extract a subset to be mapped to DC for exchange. The approach taken in the Quinkan case is quite different. Its starting point is inter-operability and extending Dublin Core in order to reflect local specificity without compromising interoperability. This is possible because the chosen base standard (Dublin Core) provided a formal process for refinement and localisation. So long as the DC architecture is maintained, new refinements can be introduced without breaking inter-operability. The next step is to ensure that opportunities to cater for and reflect local specificity have not been sacrificed in the draft Quinkan MAP.

CHAPTER 5: DRAFTING A MAP FOR THE QUINKAN MATCHBOX

The ARH Framework

The process for assembling the Quinkan application profile follows the 'ARH' framework: aggregation, rationalisation and harmonisation (Currie et al., 2002). The methodology was developed by Currie et al. in an attempt to help information managers from various Victorian State agencies to visualise inter-operability. In many ways, the Victorian visualisation task and the Quinkan Matchbox endeavour are similar. Typically, metadata is created by various agencies to serve a variety of internal purposes or to represent specific points of view. Currie et al. (2002) argue that such metadata may not have to be "technically different" (p. 178). They propose to develop "a central, comprehensive application profile derived from the current requirements and foci of all users, that does not place limits on high level local specificity but enables deep and comprehensive metadata inter-operability across the particular participating groups" (p. 179). The central profile is not conceived as an imposition 'from the top' to conform to a unique view of resource description. Rather, it is an invitation to increase interest in harmonisation by using consensus to design a cross-community profile. The authors also suggest accompanying the central profile with transformation rules and cross-walks to and from other metadata sets.

The ARH framework provides a methodology to assemble the Quinkan profile and ensure its inter-operability. The first step, aggregation, consists of the collection and analysis of element usage and usage variations. The second step, rationalisation, looks at all the metadata elements aggregated in step one and eliminates unnecessary variations. Elements are merged if no substantive semantic differences between them are found. In

the Quinkan Matchbox context, the aggregation stage produced redundancies across several data sets with fields or elements named differently although they had similar scope and definitions. The rationalisation process is intended to reduce the number of elements, and therefore simplify the application profile, while increasing inter-operability. The rationalisation of the MAP v. 5. 0. was greatly assisted by the existence of several cross-walks: the Getty cross-walk from CDWA to DC (Simple), USMARC, Object-ID, VRA Core 3.0 and CIMI (Harpring et al., 2000), the MARC21 to DC (Qualified) cross-walk produced by the Library of Congress ([MARC-to-DC], 2001) and the VRA Core to MARC cross-walk produced by VRA (Clarke, 2001). In keeping with one of CIMI's test bed outcomes, value lists that would serve to localise the application profile (see Chapter 7) and reinforce its semantics have been favoured over the introduction of new elements and qualifiers. The third step is the harmonisation of the metadata. The third step may not apply immediately as the Quinkan Matchbox is not seeking to influence the data structuring and formatting of its future partners. At least three agencies have already offered data sets for importation into Matchbox. One of them has indicated they would be interested in obtaining feedback from the import exercise with a view to adjust or revise their own record structure (M. Sutton, Australian Heritage Commission, February 2004, personal communication).

A number of 'local' catalogues were scrutinised with particular interest in the aggregation process of developing the Quinkan MAP. They were identified as holding records about Quinkan resources. The catalogue of the Institute of Aboriginal and Torres Straits Islanders Institute (AIATSIS) is a rich source of bibliographic records about Quinkan materials, ranging from press clippings to sound recordings, from collections of

slides to bequests of archaeological charts and drawings. The Institute's current cataloguing system has been developed from the original card catalogue, with reference to Dublin Core and AGLS (Field Notes, November 2002). It contains records at item and collection levels. Collection level items relate to deposits or donations that the Institute want to make visible in the catalogue but has not yet had time to itemise. With a large user base of Indigenous researchers, the Institute has good experience of their interaction with the catalogue and has structured its profile accordingly.

The Queensland Environmental Protection Agency (EPA) paper-based site cards represented an attempt to standardise the information collected by EPA staff, consulting archaeologists, rangers, and others throughout Queensland for the purpose of conservation, or damage monitoring. The cards have since been transferred to a Microsoft Access Database known as the Indigenous Site Card Database ([EPA-Qld], 2001). Although archaeologists build their own categories according to the kind of research question they are seeking to answer, (N. Cole, 18 February 2003, personal communication), EPA site cards provide a well accepted common ground for site recording. The Australian Heritage Commission (now Department of the Environment and Heritage) has compiled the Register of the National Estate (RNE) since 1976. It contains in excess of 13,000 places of natural, historic and Indigenous significance. The Australian Heritage Places Inventory contains summary information about places listed in State, Territory and Commonwealth Heritage Registers ([AHPI], 1999).

Other data sets have been examined that will be identified throughout this section. They have provided an overview of terms and refinements used by potential Quinkan Matchbox partners. They have also provided a sample of user interface (UI) functionality,

some of which can be derived directly from the structure of the profile. Additional suggestions were collected from various readings about Indigenous culture and about the Quinkan region as well as from notes taken during fieldwork. This overview has limitations. No schemata (XML or other) have been collected. In some cases, the published application profiles and best practice documents were consulted. In others, only catalogue interfaces and sample records were available.

The aggregation process described by Currie et al. (2002) has been applied to assemble a basic Quinkan data dictionary. Staff at the National Museum of Australia (NMA), suggested that a simple set of three questions would take user satisfaction a long way: “What is it? Where is it? How can I access it?”(Field Notes, November 2002) In the absence of pre-established collection content and well-defined user requirements, the MAP is designed for discovery purposes. The MAP needs to support the description of ‘real’ physical objects and their digital surrogates, and be able to differentiate one from the other and relate them.

The available information has been aggregated in a table formatted so that each DC (Qualified) element occupied a single cell. Column two was reserved for encoding schemes and a third column for data entry. All the schemes recommended as part of the DCMES 1.1 were added. Terms from the DC-Libraries and DC-Education Application profiles have also been included in the mix, together with elements from the draft Collection Level Description application profile and AGLS. Some of the proposals from the DC-Government group for the Rights elements have also been considered.

Aggregating the Quinkan MAP (v. 5.0.)

Rights

The protection of intellectual and cultural property rights is an ongoing concern for Indigenous communities. One of the reasons for making Matchbox was to try and give the Quinkan community a tool that would assist the Elders in exercising some kind of control over the use and representation of their culture. Ideally, the Matchbox system should replicate the complex network of rights and restrictions on information that exist in real life.

The DC-Government Working Group is considering refinements for the Rights element, such as access rights, access control and security clearance level ([DC-Government], 2003). The DC Collection Working Group (DC-Collections) is interested in keeping track of what kinds of rights are granted with access to a collection.

AIATSIS records presented in the MURA catalogue ([MURA]) bear mention of restrictions that relate to cultural restrictions (based on gender, sorrow and other reasons) and to special handling or storage advice. Certain materials held at AIATSIS can be accessed but not copied or permission must be sought from traditional owners before accessing the materials. This notion of access control is also included in Hunters' work with the Indigenous collection of the Smithsonian Institution (Hunter, Koopman, & Sledge, 2003) and in the draft of DC-Collections level MAP current at the time ([DC-Collections], 2003b). The recommended value for "access control" in DC-Collections' proposal first draft application profile was defined as "a statement of any access restrictions placed on the collection, including allowed users, charge". In the draft

Quinkan MAP (v 5.0), this definition has been narrowed to cover notes on storage and handling and other culturally appropriate restrictions as suggested in Hunter's work.

Strang (1997) has noted that permission and restrictions often apply to places as much as to objects. In the course of her work at Kowanyama, she has encountered restrictions to place access such as, enter this location downwind only, or under other specified circumstances. In his writing about Warlpiri television, Michaels (1986) noted that "kinship can also be thought of as a communication model. It establishes who will communicate to whom, around what issue and in which setting. A chart of a kinship system then can also be treated as a cybernetic model for information flows, accounting for the circulation of news and knowledge around the kin network" (p. 8). By extension, a mapping of kinship in Laura, could be modelled and form the base for the Quinkan Matchbox's rights and authentication sub-system.

Description

The Queensland EPA has created a set of reporting cards to assist in the recording of sites and products of the art contained in a particular site or gallery. With this system, each motif is categorised by colour, motifs and technique. Each category is then tallied up. This data can be used later in site analysis and monitoring. For the purpose of testing the MAP (v. 5.0), a site description 'module' has been considered as the alternative way of writing an abstract or a site summary.

Descriptions in the RNE are articulated around three main categories: statement of significance, condition of integrity and description (abstract). In many ways, the statement of significance is the contextual information that brings cultural heritage records 'alive'. It contains much richer information than would otherwise be constrained

into a Subject or Coverage entry. It is interesting to note that CDWA recommends maintaining contextual information in essay form in a descriptive note, but it also recommends indexing it in other fields, using controlled vocabularies as much as possible. DC's Description element was never conceived for this purpose. It is a matter of choice of implementation strategy to decide to introduce a new element to accommodate these values, or to create specific refinements for Description or to attach the information, as suggested, to Subject. What is important is that this information is recorded 'somewhere' in a way that is interoperable with the EPA structure and that it can be viewed and (possibly) exported to be used by other systems.

Object Name

The DC Collection Description first draft MAP suggested an element called "Object name", as a sub-property of Subject. This element is also found in Object-ID with "Type of Object". A similar element appears in a proposal for a common record format issued by the Australian Universities Museums Online ([AUMOL]) with "Category of object" and "Type of object". In the Collection Description MAP (first draft), Object name is defined as "an object name associated with the items in the collection" and it refines Subject ([DC-Collections], 2003b). Object name also fits well within the existing AIATSIS structuring of the Subject area that is articulated around four sub-categories (Topical, Person, Place and Language or Cultural Group), which can also be regarded as four distinct facets for a given subject.

Date

It is anticipated at drafting stage that more qualifiers for the Date element will be needed. Extra qualifiers may be useful to accommodate Cole's advice with regards to

archaeological drawings that the most important information is the date of recording, as it helps monitor damage to sites (Field notes, August 2002). It is necessary, however, to test if these new refinements really add a new dimension or if they can be conflated without loss with “Date Issued”, “Date Created” or any other date refinement already included in the DCMES.

Type

The Quinkan MAP has to anticipate that a number of partners will either not use Type as an element or will use local values. This is the situation experienced by the University of Illinois OAI Metadata Harvesting project (Shreeves, 2002). This project undertook to define a two-level hierarchical vocabulary, with a main Type using the DCMI Type list and subtypes of more specific nature that would facilitate resource groupings in a less overarching way than the main type. Shreeves reports that the main type and subtypes were not set up as nested values, with DCMI Type terms acting as the main type and the other terms nested within each type. Instead, they were set up as two distinct value lists.

The Illinois project team decided to create an application-specific vocabulary, but to base it on a combination of recognised vocabularies. They used the DCMI Type list, adding CIMI’s Party and Place. They also created a list of sub-types, drawn from a variety of sources, including The Getty’s AAT, LCSH and the Thesaurus for Graphic Materials II ([TGM-II], 1995). One of the advantages of the type and sub-type notation is that it allows the lists to retain inter-operability at DCMES level and at the same time maintain domain level granularity. The sub-types can also be seen as having a definition (or illustrative) value for the top-level type. More sub-type values can be inserted as the variety of content represented in Matchbox increases. The main type and sub-type

solution has been retained for testing, but the values have been included in a single list. It is equally interesting to evaluate if the greater granularity of the Type list can assist in building better functionality in the search interface.

The document type list suggested by AGLS has been considered a possible source of values, but they are best suited to the government sector (e.g., contract, media release, agenda). Sub-type values need to reflect the type of document most likely to populate the Quinkan Collection. Type is often defined as the genre of the resource and it is quite distinct from the format of the resource. The MARC genre list is a reliable and fairly comprehensive source of terms ([MARC-Genre], 2003). When considering the Quinkan project, Cole (Field notes, 2002), however, suggested a list of document types commonly found in archaeology (i.e., maps, field notes, drawings, prints). These values have been added to the MARC genre list to suit local requirements.

Format (medium and extent)

A short list of physical formats (based on the list proposed by the Museum of Victoria) has been added to the MIME list of Internet media ([MIME]) types supported by the DCMES, in order not to privilege digital resources over physical resources (see Table 7). CIMI's suggestion to indicate whether an instrument is required to access the physical resource has been retained with the inclusion of the values "macroscopic" and "microscopic".

Extent has been structured with values such as duration, resolution, or dimension, which corresponds to the many ways extent is expressed depending on the resource type (and suggested by VRA's refinement for its measurement element, mapped to Format). No unit of measurement scheme has been suggested and users are expected to follow

good data entry guidelines. This compromise solution is necessary to accommodate the diversity of information contained in this area. The type of resources being catalogued influences the structure of the data required. If Type is Text, Extent is more likely to be pagination or word count than duration. The Kinetica Union Catalogue ([Kinetica]) is one example of a cataloguing system offering data input templates customised according to the bibliographic record type chosen at the beginning of the session. (This issue belongs to the area of technical requirements and is beyond the scope of the design of the Quinkan application profile).

Format	
compact disc CD ROM DVD digital audio tape (DAT) digital videocassette film reel microform	S-VHS videocassette slide sound disc (as in an LP record) tape (meaning reel-to-reel) tape cassette transparency U-MAX videocassette VHS videocassette

Table 7. List of physical formats suggested for the Museum Victoria metadata structure.

Language

A language list is required for both the Language element and for language as a Subject. Indigenous languages cannot be encoded with any of the lists recommended in the DCMES. A Quinkan-specific list is required, based on the languages present in the Quinkan area. Alternatively, language lists could be sourced from the Australian Bureau of Statistics (ABS) or AIATSIS. The AIATSIS notation for language is cumbersome. In the AIATSIS catalogue, Language notations are related to a grid reference from the Australian Mapping Grid (AMG). For Kuku Yalandji as Language or Cultural Group, the notation would be “Gugu Yalandji / Kuku Yalanji language (Y78) (Qld SD55-13)”.

The AIATSIS catalogue maintains for each language authority a vast network of ‘See’ and ‘See also’ references leading to spelling variations in language names’ and names of languages in other languages. This complex network of cross-references is necessary to accommodate the fact that Aboriginal language names have no fixed spelling and that in many cases users cannot be expected to know the preferred spelling(s). This facility enables users to search on any possible variation of a language name and retrieve a comprehensive list of records. A similar facility is required for the Quinkan Matchbox, with one preferred term and a discreet mapping to variations. It may also be appropriate for the Matchbox development team to offer icons for language groups.

Coverage

Spatial coverage is crucial in the Quinkan Matchbox context. Many places in the Laura area, however, cannot be identified by officially gazetted names. Place names may refer to different location types (i. e., a reservoir, a hill, and an out-station) that may share the same name, but be a considerable distance from each other. Some locations can only be described by indicating their geo-spatial boundaries or their GPS coordinates. The Australian Gazetteer ([Gazetteer], 2004) is an authoritative source with a framework to help check place names. The Gazetteer uses Feature Codes that include Town or Locality, Watercourse or even Tree, Unbounded Locality, Road Bend, Cliff, and many more. They are used to refine the type of resource described by any given name or coordinates.

The TGN and the Australian gazetteer have been recommended as preferred sources of place names, but for the sake of simplicity the feature codes of the gazetteer

have not been introduced in the Quinkan MAP (v 5.0). Free text entry is allowed in this element as a way of collecting local place names. A list of local physical regions used by Cole (1995) has also been included, although it may be more relevant to academic subject specialists than to local residents of Laura and visitors.

Geo-spatial metadata

Considering the importance of place and country in Indigenous culture, geo-spatial metadata has an important role to play, as both a discovery tool and an aid to resource description and identification. Geo-spatial information is recorded as part of RNE ([RNE]) and EPA records held in the Indigenous Site Card Database ([EPA-Qld], 2001). Spatial coverage can be expressed using DCMI Box (Cox, 2000a; [DCMES], 2003). In the EPA system, a location can be identified, albeit with diminished precision, with a combination of map sheet name and grid reference. RNE records can be searched according to latitude, longitude and map reference (Figure 5).

Figure 5. The Register of the National Estate's geo-spatial and map coordinates search module.

AIATSIS uses a notation including a reference to the Australian Mapping Grid. A typical entry for Laura would read “Laura / Quinkan area (Qld SE Cape York SD55-13)”.

There has been discussion with representatives of the Quinkan community about the implication of recording the precise location of sites and of making GPS information available to the public. In the absence of a gazetted location, some site locations can only be identified through name and geo-spatial coordinates. However, concerns were expressed that sites could become more vulnerable to degradation and uncontrolled access if their exact location were revealed.

The geo-spatial metadata attached to Quinkan resources could follow the standard produced by The Spatial Information Council for the Australian and New Zealand governments (ANZLIC) that has produced metadata guidelines for geographic information, referred to as ANZMETA ([ANZMETA], 2001). ANZMETA is intended to assist in the description of spatial data sets, online and offline. The standard comprises 41 elements that can be mapped easily to AGSLS (Cox, 2000b). Recent additions, not included in Cox’s mapping, include an ANZLIC identifier, specifications for “Geographic Bounding Box”, specifications for structuring the element Geographic Extent Name (GEN) and the adoption of ISO 8601 to encode Dates ([ISO-8601], 2003), which brings it in line with DCMES. An examination of the ANZMETA structure for Geographic Bounding Box strongly supports the implementation of DCMES Point and Box as an encoding scheme for the Coverage element.

Coverage (temporal)

Temporal coverage requires a great variety of data input. It can be expressed as dates, as text for cultural periods (taken from a controlled vocabulary or not) or as time-spans with DCMES Period encoding. Cultural periods expressed as text could be treated as Subject. It is a matter of choice made at implementation time. Using DCMI Period (as recommended in Coverage) as opposed to periods defined in a controlled vocabulary also gives additional flexibility. The Faceted Application of Subject Terminology (FAST) system developed by researchers at Online Computer Library Center Research (OCLC Research) is a simplified LSCH vocabulary developed by 'deconstructing' the subdivisions used to build subject headers (O'Neill & Mai Chan, 2003). The sub-divisions are assigned to relevant DC elements. For example, the geographical facet would be assigned to Coverage (spatial) and the chronological facet would be assigned to Coverage (temporal).

Future resources described in the Quinkan Matchbox may include archaeological sites or artifacts for which the flexibility offered by DCMI Period will be useful. Australian archaeological eras are named and delimited differently from their European equivalents. Laura's Rock Art has its own sequence proposed by Morwood and Hobbs (1995). Archaeological periods are usually expressed as 'negative' dates, as in '18 million years ago'. Carbon dating data is accompanied by a mention of the method by which it was obtained. W3C's Date and Time Formats (W3CDTF, 1997) do not cope well with 'Before Present' (BP) dates and for this reason the Collection Description Working Group has recommended the adoption of ISO 8601 to express these particular dates and periods (Johnston, 2003, 9 September, Section 7) (See also Table 6). A cultural

period expressed with DCMI Period can also be used to generate a time line on a chronological browse category, while a cultural period as subject header may be limited to being treated as text and indexed alphabetically. An indicative list of themes may be useful to express important periods in the life cycle of Laura and the Quinkan region that cannot be framed precisely by dates or these events (social or personal) that are cyclical (season, festival, rituals). A scheme has been suggested (with an indicative value only) in v 5.0. It contains values like ‘Gold Rush’, ‘Pastoral leases’, ‘Chinese (era)’, ‘Missions’. (The role of themes is further discussed in Chapter 7.)

Identifying the location of resources

The Quinkan Matchbox repository aggregates resources from various existing locations and collections. Some have a digital presence that can be identified with a URI, other are only available offline. It is therefore important that users are given a pointer to the location of offline resources. It may also be relevant to record the provenance of the records and make this information visible. A-core metadata would record this information as well, but would keep it hidden ([DC-Admin], 2003).

The Location element from the DC-Libraries application profile is intended to identify “the organization holding the resource or from which access is obtained.” It is recommended to use this element whenever a URI is not appropriate. However, DC-Libraries also recommends that call number and local accession numbers be used as identifiers. In the Quinkan Matchbox, this poses the problem of the uniqueness of these identifiers, and also the relationship between location and item.

The field “Current Location” was suggested by CDWA (and CDS) to record either the repository holding a resource or the geographical location of a site or

monument. In the Getty cross-walk, none of these fields are mapped to a Dublin Core element, but it could be argued that the geographical location of a site can be noted in Coverage (spatial).

In VRA, Location is used to record the history of location (current, past), the past and present site location, as well as creation and discovery location. This historicity has not been deemed valuable for the Quinkan Matchbox, which is mostly concerned with the current location of resources. The values offered in this element could be read from a partner registration module where partners could be described in greater detail (potentially using the vCard structure).

The DC-Collections Working Group's proposal for "hasLocation" as a further refinement to Relation has also been included. It is defined as "the identifier for the physical or online (digital) location of the collection" and the URI encoding scheme must be used.

Availability and Location

The AGLS Availability element, created to describe access characteristics of a person or organisation making non-electronic resources available, is understood as being distinct from (and more precise than) the Location element. The Availability element describes the point of contact in the organisation holding the object (often a person) and the cost of accessing it. It is understood as being distinct from a rights holder's statement. This is of interest for the Quinkan Matchbox in the case where a repository can only disclose the existence of a document and needs to refer the user to a third-party for personal contact. The Availability element follows a specific scheme (AglsAvailability) that has been included in full. The element Location suggested by the DC-Libraries

Working Group for their application profile (Guenther, 2002) has also been included under the name QM-Partner and will name the repository where the resource is held. It has been noted that PictureAustralia uses the Source element to name the contributing institution. In the Quinkan MAP (v. 5.0.), Source has been reserved for future use.

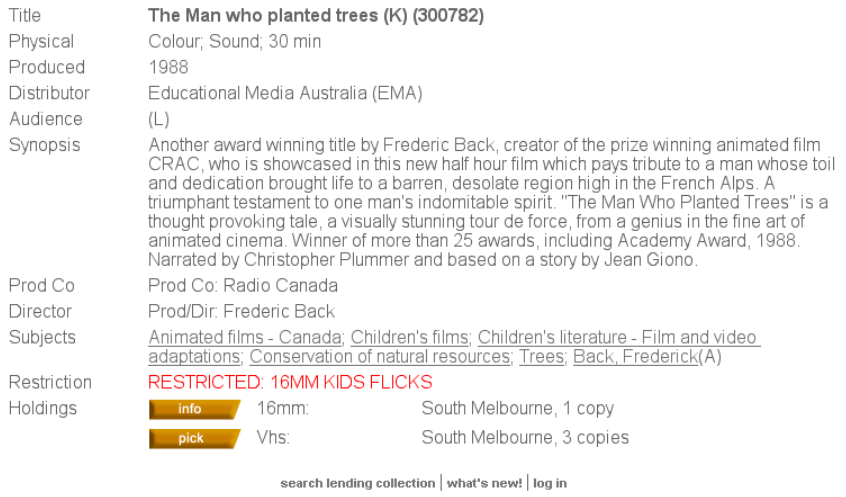
Identifier

The DCMES endorses URI as the preferred form of identifier. DC-Libraries recommends other formal identification systems, like ISBN. Identifiers like ISBN or ISSN numbers can assist in the discovery process, but their unicity could not be guaranteed in a system like Matchbox that aggregates resources from various sources. Further, URI are usually not searchable. The question of globally or locally unique identifiers is connected to the notion of duplicate records. Organisations usually look upon duplicates as a sign of poor record management. In the context of a project that is a stock-take of Quinkan materials, there is however a vested interest in creating duplicates for the sake of being exhaustive and ascertaining how much is ‘out there’ and where.

Business rules and quality assurance policy will be required to keep the metadata repository in good order. The Quinkan Matchbox could implement a naming convention for its content. Record management and harvesting (among other processes) relies on record numbering to update or delete records in the target repository after each round of harvesting. RLG recommends that its contributors use an identifier that is persistent and unique within their own institutions (Waibel, 2002). The NLA has adopted a persistent identifier approach with a local scheme (NLA, 2003).

In the Quinkan MAP (v. 5.0) URI, ISBN, ISSN, have been retained as identifiers. Local accession numbers and record numbers have been allowed, but organisations using

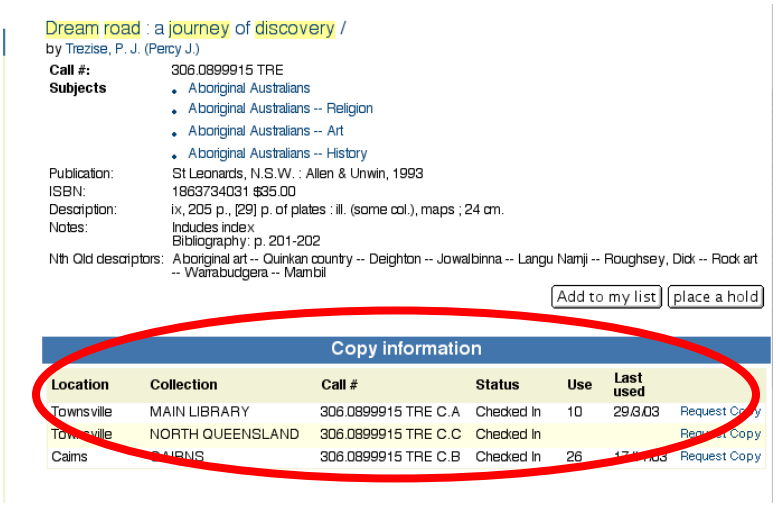
these numbers need to be identified, possibly with a prefix. The question of the relationship between records and locations should also be looked at. Library catalogues try to maintain (whenever possible) unique records for a given item but list all the locations where the item can be found in a Holdings statement (Figures 5 and 6).



Title	**The Man who planted trees (K) (300782)**
Physical	Colour; Sound; 30 min
Produced	1988
Distributor	Educational Media Australia (EMA)
Audience	(L)
Synopsis	Another award winning title by Frederic Back, creator of the prize winning animated film CRAC, who is showcased in this new half hour film which pays tribute to a man whose toil and dedication brought life to a barren, desolate region high in the French Alps. A triumphant testament to one man's indomitable spirit. "The Man Who Planted Trees" is a thought provoking tale, a visually stunning tour de force, from a genius in the fine art of animated cinema. Winner of more than 25 awards, including Academy Award, 1988. Narrated by Christopher Plummer and based on a story by Jean Giono.
Prod Co	Prod Co: Radio Canada
Director	Prod/Dir: Frederic Back
Subjects	Animated films - Canada; Children's films; Children's literature - Film and video adaptations; Conservation of natural resources; Trees; Back, Frederick(A)
Restriction	RESTRICTED: 16MM KIDS FLICKS
Holdings	info 16mm: South Melbourne, 1 copy
	pick Vhs: South Melbourne, 3 copies

search lending collection | what's new! | log in

Figure 6. A record for the ACMI online catalogue showing location, holding and medium available for a given Title ([ACMI-Coll]).



Dream road : a journey of discovery /
by Trezise, P. J. (Percy J.)

Call #:	306.0899915 TRE
Subjects	• Aboriginal Australians • Aboriginal Australians -- Religion • Aboriginal Australians -- Art • Aboriginal Australians -- History
Publication:	St Leonards, N.S.W. : Allen & Unwin, 1993
ISBN:	1863734031 $35.00
Description:	ix, 205 p., [29] p. of plates : ill. (some col.), maps ; 24 cm.
Notes:	Includes index Bibliography: p. 201-202
Nth Qld descriptors:	Aboriginal art -- Quinkan country -- Deighton -- Jowalbinna -- Langu Namji -- Roughsey, Dick -- Rock art -- Warrabudgera -- Mambil

Add to my list | place a hold

Copy information

Location	Collection	Call #	Status	Use	Last used	
Townsville	MAIN LIBRARY	306.0899915 TRE C.A	Checked In	10	29/3/03	Request Copy
Townsville	NORTH QUEENSLAND	306.0899915 TRE C.C	Checked In			Request Copy
Cairns	CAIRNS	306.0899915 TRE C.B	Checked In	26	17/[illegible]/03	Request Copy

Figure 7. A record from the JCU Libraries catalogue showing location, collection, call number for a given Title.

This strategy also speeds up the cataloguing process. Cataloguers only need to locate an existing record for a given resource and attach their organisation code or their collection name, instead of cataloguing an item in full, with a new record.

The Coolcat service is a portal giving access to the catalogues of seventeen Victorian University libraries[11]. The search results are listed for each location (see Figure 8).

Figure 8. Search result display from the Coolcat catalogue ([Coolcat]).

In a secondary screen (see Figure 9 “More Details”), copy information is displayed. Published resources may only represent a fraction of the content of the future Quinkan Matchbox. Unlike Web sites or museum objects, they will contain duplicate entries (e.g., books by P. Trezise).

[11] The Coolcat service uses the Z39.50 protocol to simultaneously cross-search the library catalogues of University libraries that are members of the CAVAL network. A portal provides a single interface from which to search and to display results.

Location:	Call Number:	Availability:
Monash	Gippsland Library 940 PRA	Total 1; Available 1, On Loan 0, On Hold 0
Monash	Matheson Library Main Collection 940 P916.I	Total 1; Available 0, On Loan 1, On Hold 0; Due Date 2004-04-15 23:50:00
Monash	Matheson Library Undergraduate Collection 940 P916.I	Total 1; Available 0, On Loan 1, On Hold 0; Due Date 2004-04-21 23:50:00
Monash	Caulfield Library 940 P916.I 1992	Total 1; Available 0, On Loan 1, On Hold 0; Due Date 2004-04-16 23:59:00

Figure 9. Copy information for one of the items retrieved in the search (displayed in Figure 8).

Roles as qualifiers

The EPA database contains a small list indicating the professional background of people submitting site recordings to the agencies. The Museum Victoria metadata structure (Version 0.9) has defined two, mutually exclusive, short lists of 'typical' roles for Creator and Contributor to be used as qualifiers. These two lists imply a strict distinction between what is first level creative role and second level role (contributor).

DC Author or Creator	**DC Other Contributor**
Definition: *An entity primarily responsible for making the content of the resource. For example, author of written document; artist, photographer, or illustrator of visual resource; or founder of an institution. For natural specimens, this element specifies the determiner, collector and/or observer.* This field will have a qualifier of ROLE which will include the following options: **Qualifier: Role** Artist Author Collector Identifier Illustrator Manufacturer Observer Photographer Sculptor	Definition: *An entity responsible for making contributions to the content of the resource. Examples of a Contributor include a person, an organisation, or a service.* This field will have a qualifier of ROLE which will include the following options: **Qualifier: Role** Artist Benefactor Editor Manufacturer Patron Preparator Sponsor Translator

Table 8. Role values for the elements Creator and Contributor suggested for the Museum Victoria metadata structure.

The EPA and Museum lists fit their specific context well. For the Quinkan MAP version 5.0, values were extracted from the MARC list of roles ([MARC-Roles], 2003), some of which overlap with the Museum Victoria values. The MARC list was chosen because it is part of a widely accepted family of standards. A second list containing non-duplicate values from the EPA database was also included. An “Other“ option was made available to gather role names not covered in the lists. The same list of values was assigned indifferently to Creator and Contributor to take into account the fact that these two elements are often conflated.

The addition of the AglsAgent encoding scheme (Personal name, Corporate name, address, contact, e-mail) offers good cross-walking possibilities with the MARC record structure. But it presents a specific challenge when combined with the DCMES schema. The DCMES is evolving in its architecture and syntax and is moving from being expressed in HTML to XML (and now RDF) syntax. XML would have little difficulty expressing a schema where each creator has an encoding scheme and a value. But the decision taken by DCMI to remain downward compatible with the old HTML syntax makes it too constraining to express nested values. This is a known problem, and one that the DC Agents Working Group has placed on its agenda ([DC-Agents], 2003).

Collection Description

A selection of Collection Description elements has been added to v. 5. 0 as they became available from the DC Collections Description Working Group, in particular, hasLocation, Object Name and Access Control. The draft application profile of the Collections Working Group has been modified in August 2003 following the DC Conference held in Seattle. The elements included in v. 5. 0 of the Quinkan MAP were

those published in the first draft (proposal) of the Collection application profile released in June 2003 ([DC-Collections], 2003a). The Collection Description application profile remains a work in progress and some of these elements may no longer be supported in the time for the Quinkan draft MAP (itself a work in progress).

Summary of the rationalised Quinkan MAP (v. 5.0.)

The rationalised MAP needs to be tested with sample records covering all resource types and described according to the schemata of a large variety of potential Quinkan Matchbox partners. The draft MAP (v 5. 0) is made up of DCMES 1.1 plus AGLS elements. Domain specific value lists and encoding schemes have been favoured over the introduction of new elements. It is hoped that the MAP strikes the appropriate balance between cross-domain inter-operability and local specificity. As the community takes ownership of Matchbox, it is expected that more suggestions to localise the MAP will arise and be implemented. Testing will focus on cross-domain inter-operability, more specifically the ability to import existing records from various sources into Matchbox with an acceptable level of information loss. The testing phase should also establish that the metadata contained in Matchbox supports search, browse and other functionality to meet user expectations. The ultimate validation will be that of the Quinkan community for whom Matchbox is designed.

Results

CHAPTER 6: TESTING THE QUINKAN MAP (V 5.0)

The environment

The Quinkan MAP v. 5.0 has been assembled by building on DC (qualified) and other data sets used by cultural heritage institutions. It also draws from existing repositories of resources with Indigenous subject matter and from the reviewed literature about Indigenous (not exclusively Quinkan) culture. The purpose of this exercise is to test the draft MAP's ability to accommodate records developed by third parties. In accordance with the goal of inter-operability, it is necessary to test that resources catalogued in other systems or according to local profiles can be cross-walked to the Quinkan Matchbox with minimum loss (or at least an acceptable level of loss).

The testing was conducted in a prototype environment (James-Mk II) created by one of the Quinkan Matchbox team members, as replacement for the Matchbox system whose development was behind schedule. The test environment consists of the draft MAP written as a data input form in HTML and a back end file collecting the data in comma separated values (CSV) which can be loaded into an Excel spreadsheet. This environment is sufficient to test the adequacy of the MAP to transform incoming metadata into Quinkan metadata and record the amount of loss or distortion incurred in the process.

The test records were selected from the Web and from various catalogues available online. The owners of the records and the repositories chosen could become partners of the Quinkan collective in the future. Records covered as many types of resource as possible at both item and collection levels. Other items catalogued were not Quinkan related, but represent a certain resource type. Several data input methods were

applied. Records available in MARC format were cross-walked into the Quinkan MAP, with the assistance of the MARC to DCQ cross-walk maintained by the Library of Congress ([MARC-to-DC], 2001). Resources with metadata (either embedded or linked) were cross-walked with no changes or as few as possible. In some cases editing was necessary to ensure the best possible fit. Resources without metadata were catalogued manually.

The sample consists of 263 records, most of which can boast Indigenous or Quinkan subject matter. It includes the full inventory of the archaeological charts deposited by Percy Trezise at JCU's Library. The test sample may appear rather small. The experiment to visualise inter-operability conducted by Currie et al. (2002) with seven Victorian government agencies consisted of only 29 records. Despite the small sample, it was sufficient to demonstrate the point that metadata previously deemed standards compliant and interoperable, in fact strayed from the required standards in many ways (from 29 records only, 49 different metatags were generated). It has been assumed the 263 records, carefully chosen to represent the various possible cataloguing styles and media types, could yield equally rich and illustrative results.

The test environment has limitations. For instance, it does not allow for the repeatability of elements, which is an essential Dublin Core principle. In many cases, resources may have more than one author, or coverage may be expressed in a variety of units or schemes. In these cases, the relevant element would need to be repeated to accommodate as many times as needed to record the values and the name of the scheme they originate from. Drop-down lists make it difficult to choose more than one value for a given element. For example, the Rock Art description module presented in v. 5.0 offers a

long list of possible Rock Art motifs. In the case of a overview description of a particular gallery, more than one motif will be chosen by the user. Similarly, a resource can relate to more than one language or cultural group. The current presentation of values, in long drop-down list and element cloning facility, makes it singularly difficult to assign more than one value to a given element. Clearly, support for both tick boxes and radio buttons is necessary in the real Quinkan Matchbox.

The testing environment did not output XML encoded records, only CSV as there was no XML schema available for the Quinkan MAP at the time of testing. Representing MAPs and their output as an HTML form and CSV does not allow the schema designers to properly visualise the taxonomies derived from the MAP. In other words, data that would normally appear as multi-dimensional is flattened in HTML. Tools are needed to visualise the schema, the richness of the facets created and assist in their manipulation. Tools are needed too that can be used directly by the designers without the technical mediation of the system developers. This means there was a limitation in this aspect of testing.

The test data was shown not to be a very good example of cataloguing although it was true to what is often found in DC-type records made by non-professional cataloguers. Some records need reviewing and some obvious mistakes need to be corrected. It contains errors of interpretation and errors of appreciation as to the correspondence between elements. Some database fields encountered during testing were difficult to interpret and map to DCMES elements with certainty.

A number of cross-walks were used as guides for correspondence between various metadata sets (Clarke, 2001; Harpring et al., 2000; [MARC-to-DC], 2001).They

too have limitations. Some are dated and do not keep up with the evolution of some of the metadata sets they map to. Mappings are often a matter of personal interpretation and so are not always normative. As such they are to be used as guides, not firmly set rules. Cross-walks work well as unidirectional documents, but less so as multi-directional guides. They are by nature fluctuant and subjective documents.

Results and Analysis

Date

The Quinkan MAP v 5.0 only had four refinements for the Date element: valid, created, modified and date data gathered. The first three are conforming to DC, the fourth is a suggestion from the Core Data Standards with regard to heritage and archaeological surveys. Cole has confirmed that he date of data collection (or site recording) constitutes essential information for the purpose of site management and monitoring (Cole, Field Notes, 2002). The rationale was to simplify the map as much as possible to simplify data entry. There was, at the time, confusion between a MAP as a data entry form and a MAP as "what the application understands" (Heery, 2000, Slide 9). If the MAP is to act as the central registration point for all the things the application is meant to understand or interpret at any given time, it has to be a complex and all encompassing document. Simplification or grading according to difficulty levels is a technical requirement that can be handled by the creation of customised data entry templates. More DC-approved Date refinements need to be introduced in the next version of the Quinkan MAP (hereafter v. 6.0, see also in Appendix 3).

Two types of date refinements can be distinguished: refinements to describe milestones in the life of a resource and those to describe the degree of certainty or

accuracy in the dating of a resource. Milestone refinements encountered during the testing have included deposited, acquired, last updated, donated, recorded and registered. DC's Collection Working Group uses accumulation date range and contents date range for collections. SPECTRUM recommends date (absolute), date (earliest), and date (latest) as well as the notion of circa to describe the degree of certainty in the dating of a resource.

It is unlikely that all the candidate refinements encountered are required in the Quinkan MAP. Some of them can be conflated on account of overlapping scope and definition, as there is little difference between created and data gathered, between modified and last updated. Oral histories are accompanied by “date recorded” which is very similar to “date data gathered” used by heritage surveys and archaeological campaigns. In order to describe basic milestones in the life cycle of a museum object, the MAP would require additions like acquired, donated, deposited, loaned and possibly more. The Quinkan team will need to decide whether the purpose of the catalogue is to track the past of a resource or to mark its present location (or both). Date refinements are often inspired by management functions that are not the immediate concern of Quinkan Matchbox.

Expressing the accuracy of dating is problematic with W3C-DTF or ISO 8601 notation. This notation does not handle BP dates either. BP dates may be required to express temporal coverage. As a compromise solution, dates in the Quinkan Matchbox MAP can be written as text, accompanied with notations like “circa”, “BCE” or even, in some cases a question mark.

Date-related problems have been raised to DCMI by a number of member groups. As a result, the Date Working Group was re-charted in October 2003. The Groups new working plan includes the investigation of options to provide for the interoperable representation of commonly-recorded dates which cannot be satisfactorily represented using ISO 8601, such as BCE dates, approximate and questionable dates, open-ended date ranges, non-Gregorian dates and large dates ([DC-Date], 2004). Later iterations of the Quinkan MAP will need to take this group's new recommendations into account.

Type

The Type element in the Quinkan MAP v 5.0 has a complex structure that attempted to replicate the AGLS-style implementation (category, aggregation level and document type). The document type list contained a mixture of DCMI Type values and nested sub-types. Testing has been inconclusive, largely due to bad implementation of the AGLS structure for this element in the test MAP. The CIMI terms (party, place, natural, cultural, original, surrogate) were not encountered during testing. The set-up retained for v. 6.0 includes DCType plus 'Party' and 'Place', with a selection of MARC terms for Genre as sub-type (not nested). The DCMI Collection Type Vocabulary will be included as it becomes available.

Original and Surrogate

Differentiation between original and surrogate resources is ever problematic in the digital world, where it is difficult to trace the generation files belong to (Besser, 2002) (See also Figure 4) . The terms 'Work' and 'Image' suggested by VRA 3.0 have also been included in the Quinkan MAP v. 6.0 because it was felt they would be more useful

than ad hoc values blurred in a vague “Other Types” category. Scope and definitions should be added to clarify the usage of either value.

Format

The Format element receives a great variety of data and data input styles. MARC21 has been used as a guide to clarify scope and definition of this element and its two refinements (extent and medium). In MARC21, field 340$a represents “Physical medium”, that is “the physical substance (e.g., acetate, clay, vellum, wood) and configuration (e.g., cartridge, chip, videotape) on which the information is recorded”. This field is mapped to Medium.

CIMI's best practice guide (1999) recommends entering all information related to material and technique in the Description element, in contradiction with DC. A cataloguing rule is required here to adjudicate the preferred usage for the resources contained in Quinkan Matchbox. It is likely that incoming data will be heavily influenced by library cataloguing practices and will follow the DC and MARC patterns. The CIMI guidelines have the advantage of separating clearly what is “material and technique” from “physical support”. This rule may be useful to draw a more marked distinction between first generation resources and their multiple digital surrogates. Clearly, when writing logical pathways in preparation for data import, the mapping of MARC field 340$a to Description should be considered carefully.

DC	Qualifier / scheme		MARC
Format	IMT	856: electronic location and access $q - Electronic format type (NR) An identification of the electronic format type, which is the data representation of the resource, such as text/HTML, ASCII, Postscript file, executable application, or JPEG image. Electronic format type may be taken from enumerated lists such as registered Internet Media Types (MIME types) Example: 856 40$u http://www.cdc.gov/ncidod/EID/eid.htm$qtext/html	856$q
	Medium	340: Physical medium. $a - Material base and configuration The physical substance (e.g., acetate, clay, vellum, wood) and configuration (e.g., cartridge, chip, videotape) on which the information is recorded. Example: 340 ##$a marble.	340$a

Table 9. Mapping of the Format element according to the MARC to Dublin Core cross-walk ([MARC-to-DC], 2001).

Extent

The choice between allowing free text for extent notations and pre-structuring data entry was encountered during testing. Examples encountered during testing showed that records coming from the catalogues of libraries or museum usually carry well - formed data, often following the MARC or AACR2 styles (See Table 10).

Extent (sample values)
1
5.6 m. (40 boxes)
31 Slides
1.02m x 10.90 m; Scale: 2:1
1 Film reel (27 min.)
106 leaves

Table 10. A sample of the values entered in the Extent element (Quinkan MAP v. 5. 0).

Pre-structuring data entry to cover any kind of combination data entry style may be spurious when considered in detail. It would be simpler to trust that well-formed data will be supplied. In doubtful cases, data entry guidelines or online prompts may guide the novice cataloguer. Also, free text entry may be useful to enter local notes relating to format that would otherwise be less visible if entered in Description. Extent as text, however, cannot be indexed to form a browse or a search category.

Creative roles

Overall, the MARC list of roles ([MARC-Roles], 2003) as refinements to Creator, Contributor and Publisher has provided a good coverage of the values encountered during testing. The metadata embedded in a record from the Environmental Information Network ([ERIN], 1995) suggested the inclusion of the values “originator” and “custodian”. These are quite important roles in heritage conservation, used to identify the person or the organisation that initiates the registration of a site or monument and often takes responsibility for its conservation. Custodian is an equally important role used in ANZMETA to identify the organisation (less often a person) responsible for “ensuring the accuracy, currency, storage, security and distribution of the dataset”. Cox (2000) who produced a mapping of ANZMETA to AGLS notes that accuracy and currency appear to accord with AGLS Creator (defined as entity responsible for the content of the resource), while storage and distribution fit with AGLS Publisher (defined as entity responsible for making the resource available).

One of the records was created from an exhibition catalogue with an entry for "Anmatjera[12] Aranda Territorial Possum Spirit" painted by Tim Tjapaltjarri. In the case of the Tjapaltjarri painting, the AIATSIS catalogue was used as a source for a name authority. It showed a discrepancy in the spelling of the name Tim Leura (or Leurah) Tjapaltjarri. In many other cases, Indigenous name patterns (and restriction rules) may not fit well with the standard notations (Moorcroft & Garwood, 1997) and may require adjustment. The curatorial note found in the exhibition catalogue points to the contribution of Tim's brother Clifford in the creation of the painting. Clifford has been recorded as Artist/Contributor in the Quinkan test catalogue, but the indication of the family link could only be located in Description. The exhibition catalogue also gave the brothers' tribal affiliation. CDWA has a category called "Creator identification – Nationality/Culture/Race" that has no matching element in the DCMES according to the Getty cross-walk (Harpring et al., 2000). In VRA 3.0, admittedly a subset of CDWA, there is a cross-walk from the Culture field to the Coverage element in the DCMES (with no indication of Qualifier). It can be expressed with a term extracted from AAT or LCSH. VRA 3.0 uses the field Style/Period. It also is mapped to Coverage, with a recommendation to use AAT for terms like "Renaissance".

In the Quinkan MAP v. 6.0, the notion of temporal coverage may need to be expressed with more than just dates and should include text entries. A similar facility has been added to express spatial coverage with terms like "Anmantjera tribe" that would not be found in the Thesaurus of geographic names (TGN) or the Australian Gazeteer. Again, the term 'Anmantjera' can be found with many variations in the spelling. At a later stage,

[12] There are also a great variety of spellings in use for this Indigenous group.

the system may require a list of preferred spellings with a discreet network of spelling variation, so as not to impose too many constraints on users with little prior knowledge of Indigenous group names.

Rights

The brief scheme (public, private) in the Quinkan MAP (v. 5.0) does not establish clearly what is to be the access to the resource and to the metadata. The Quinkan users may want to flag those resources stored in the catalogue that are to be kept private and those available over the Web. The Quinkan MAP (v. 5.0) does not begin address the complex network of rights and restrictions running through any Indigenous community, let alone the complex array of rights, restrictions and warnings found in partner organisations. For example, the papers of Henry Reynolds, held at the NLA, are restricted because they are not yet catalogued (and itemised). But the collection level record about the papers is visible in the NLA online catalogue. The test dataset includes two items from the Len Webb Collection (held by Griffith University). In both case they are marked with "rightsUse=Restricted". One of the images is presented online as a sizeable thumbnail (133K, .jpg) depicting Quinkan motifs. The catalogue user is left to assume that what is restricted is access to the original image or the negative. When re-cataloguing such items, members of the Quinkan community may want to indicate a restriction on the motif as well.

In the RNE database, records of places marked as belonging to the Indigenous class only display basic information (title, place and record number, date of registration). All other identifying information (statement of significance, location) is masked. In the final release of the Quinkan Matchbox system, rights set at resource level will interact

with the authentication process that occurs at login stage. These two processes must be regulated by a series of business rules to avoid conflict.

In the records of the Screensound Australia catalogue, the warning or restriction messages regulate access to the physical resource, not the meta-record. In the ACMI records, “Classroom Use Only” is a rights statement related to access to the physical resource and describes a restriction imposed by the rights holder of the physical resource (usually the distributor or the supplier). The ‘access rights’ qualifier was proposed by the DC-Collections Working Group as a way of expressing “restrictions placed on the collection, including allowed users, charges”. It has been used in the Quinkan MAP (v. 5.0) to mention special conditions as mentioned above. The Collections Working Group has also noted that this sub-element should be used to establish what kinds of rights are granted to the person accessing the resource (i.e., right to view, borrow or photocopy).

A number of resources held at AIATSIS bear annotations of a cultural nature, such as “contains women only ceremonies”. Other restrictions have more to do with copyright and access precautions found in other contexts, such as “contact author before quoting from this work”. While a textual statement can be made here, there may be further functionality to be derived from linking this area to a system level module containing a scheme for rights and regulating who is allowed to see what. Similarly, the testing has highlighted there is no place in the system to flag those resources over which the Quinkan community has no control but whose content is either unauthorised or offensive. The qualifier “access control” has been abandoned by the DC Collections Working Group in the third draft of their proposal for an application profile. For local purposes, this qualifier has been used as a container for the Aboriginal warning contained

in ACMI records, although this could easily have been treated as a note and appended to the Abstract. This is a typical example of notes regarding culturally sensitive handling that do not really have a place in access rights, but need to be included in records and displayed to the catalogue user.

ACMI supplied an XML record (Fishtank) that revealed that extensive information about rights holders (usually suppliers) is kept in this area. In some cases rights holders may be quite distinct from the organisations making the resource available or even from the resource's creator. The inclusion of a vCard or AglsAgent scheme in rights should be considered and may be used to indicate the contact information for an Aboriginal organisation or a person able to give access clearance to the resource.

The area of Rights is a complex, yet crucial, area for which more consultation is needed with the Quinkan community. In the Quinkan MAP v 6.0, the Rights element has been extended to allow for the differentiation between rights to metadata and rights to resources. The rights holder can be identified using the AglsAgent scheme. A tentative rating scheme for resources has been introduced.

Identifiers and Location

Test records have uncovered a plethora of identifying and numbering schemes used by potential partner organisations. The local call number, often a Dewey number, cannot be used as an identifier as it will be represented many times over in the repository. In addition, the cross-walk document from MARC to DC also shows that field 082 (Dewey Decimal Classification number) is mapped to Subject, not Identifier.

Many organisations use their own devised call numbering or naming system (NAA, AIATSIS). AHC also uses an internal numbering scheme for Place ID and File

number. Library catalogues display Dewey numbers for the benefits of patrons, but their MARC records show that accession and database numbers are used for records management and identification. In MARC, field 001is for the control number. This is the number assigned by the organization creating, using, or distributing the record. In PictureAustralia, records retain their original identification numbers. The originating organisation is identified in Source. This combination of information will assist the user in identifying the image they may want to order from the source organisation.

The Matchbox developers team may wish to develop, at a later stage, a URI resolver scheme for Quinkan Matchbox inspired by the model developed by the National Library of Australia (NLA, 2003). This could be used to uniquely identify resources and metadata records held locally in the Matchbox repository. For the contributed (or harvested) records, it may be sufficient to retain the original numbering schemes and add an organisational prefix. Assuming each resource can be given a unique identifier, it should be accompanied by information about the location of the physical (or original) resource as shown in Table 11. Policy on mandatory elements has not yet been determined. At a minimum, the Identifier element will be mandated, to ensure that no record can be created without an Identifier.

Identifier	http://www.quinkanmatchbox.org.au/resources/OrganisationPrefix-RecordNumber
Title	A resource
Location	Organisation – Collection – Local call number

Table 11. Proposed scheme for data entry in the Location element.

It seems appropriate to ask what kind of cataloguing and records management Quinkan Matchbox wants to adopt. Copy cataloguing may be useful for those partners who want to look for a given item and simply attach their Location to it. Other partners

may prefer to see their contribution to Matchbox harvested complete with their local identity as the information contained in their records makes them intrinsically different and unique. For instance subject assignation may be unique to a particular partner's point of view. The 'inventory' approach underpinning the project would require the Quinkan Matchbox to accept each entry as a unique record of what is 'out there' and where. For the user, numbering schemes or persistent identifiers are not intuitive or searchable. The ability to identify resources with well-known schemes like ISBN should be maintained as they offer another filtering option (in Advanced Search mode). This is a matter to be resolved with a business rule.

Extending the Description element

Records from the Register of the National Estate ([RNE]) comprise a description of the site, a statement of significance, a description of the site condition and a description of the directions to follow to access the site. When adding RNE records to the Quinkan Matchbox, all these separate database fields are amalgamated into the Description element to form an overlong Abstract. The Description needs more internal structure, partly to increase the clarity of presentation (in the case of a particularly long narrative). There may be some value in attempting to separate the strictly empirical descriptions from more subjective narratives, like the statement of significance.

Cox (2000) has suggested the creation of five qualifiers for Description in order to accommodate information relative to data currency and the data set status outlined in ANZMETA. Two of these qualifiers come with value lists, the other three are free text. Considerations of data quality, which are not bound to a value scheme, can be woven into the Abstract. The table below summarises some of the (candidate) qualifiers encountered

during testing. Bold indicates the refinements included in the MAP v. 6.0. The fields indicated with Italic style have been aggregated to form a single "Data quality" refinement for Description in v. 6.0.

DC	Mura Gadi	AHC/RNE	ANZMETA
Abstract	**Significance**	*Significance*	**Update (Value List)**
Table of Contents	**Description**	*History*	**Progress (Value List)**
	Biographical/ Historical Note	Condition and Integrity	*Positional Accuracy*
		Class (Value List)	*Lineage*
		Legal Status (Value List) & Date	*Logical Consistency*
		Location (as narrative).	*Completeness*
			Attribute Accuracy

Table 12. Candidate qualifiers for the Description element.

The Register of the National Estate database (RNE) maintained by the Australian Heritage Commission introduces the notion of class of sites, whose values are Historic, Natural and Indigenous. The AHC site class values are organisation-specific and do not necessarily represent the Indigenous way of classifying places (or resources) of significance. These values contribute to the debate over what is natural and what is cultural and to whom. The AHC values conform to AHC specifications for the purpose of registration and cannot be used to describe the class of other resources. Also, class values impact on the right to see the information about a resource, as the RNE masks the metadata describing Indigenous sites. It seems appropriate to retain the integrity of the AHC Class scheme in the Quinkan MAP, but to limit its use to AHC resources.

It is a matter of interpretation to decide to which DC element the concepts of class of site map best. In the RNE database, sites of significance are classified according to their class and their legal status. Legal status in the RNE describes the level of protection granted to a site (i.e., registered, indicative, rejected, interim and more). In an early draft of the Collection Description application profile (current at the time of testing, August 2003) 'Legal status' was introduced as refinement for Description to specify the legal status of a collection. Legal Status is also part of the Core Data Structure used to describe the protection status of monuments and sites (Thornes & Bold, 1998). Both AHC schemes (Class and Legal status) have been added as refinements of Description in v. 6.0.

Object name

The Quinkan MAP v. 6.0. includes a refinement for Subject that is called Object name. Object name was originally suggested in the first draft of the DC Collection Working Group and discarded in later iterations. A similar suggestion appeared in documents published online by Australian Universities Museums Online ([AUMOL]). AUMOL documents also mentioned that a two-tier vocabulary should be used, with no further precision as to its content and structure. Such two-tier vocabulary was located on the Berdnt Museum of Anthropology catalogue ([Berdnt], 2003b). Unfortunately, this could not be included in the testing of the Quinkan MAP 5.0. It has been included in v. 6.0 in the hope in might prove useful for the users of the system to organise and browse resources. The Berndt Museum holds one of the foremost collections of Indigenous objects in Australia and its typology of object can easily be adapted to suit the Quinkan context. Some of the values contained in this typology (art, anthropologica) are inherited from older museum classification practices. The distinction between 'art' and artefact',

enshrined in museums of art and anthropology, reflect Western European/North American theories of aesthetics (Ames, 1990). Ames notes that "from the First Nations' point of view, objects may be seen as beautiful, practical, and spiritual all at the same time, and the academic tendency to focus on only some of these values to the exclusion of others diminishes the original holistic or multiplex" (p. 158). The terms suggested by the Berndt Museum offer a base for discussion and from which to create a (possibly shorter) Quinkan list or from which to validate incoming terms. The same terms are also used in the Title field in museums' inventories of artefacts (C. Belcher, National Museum of Australia, personal communication, 25 March 2004).

One or several Quinkan MAPs?

The granularity of the information contained in some records can vary greatly according to the purpose for which this information is recorded in [original records]. The draft MAP cannot render the level of detail of site description present in the EPA's Indigenous Site Card database structure ([EPA-Qld], 2001). The EPA database was created for the purpose of site recording and monitoring. It offers infinitely more granularity and precision in areas that would normally require a very long narrative abstract in a DC record. For instance, the EPA is interested in recording land tenure information about a site location, the lot number and the name of the property. The dimensions of the site are recorded together with its aspect and the slope ratio. Condition information is narrative in AHC records, but it is broken into many categories, each with a preferred value list in the EPA database. A specialised "Art Site information" card can help recording art census and damage information at even more refined and precise levels.

The designers of the Quinkan Matchbox system can choose to create a hugely complex MAP to replicate the EPA design. Or they can chose to design a dedicated MAP that would be interoperable with the EPA system and provide a model profile for future records about sites in the Quinkan Matchbox. It is expected that such records would still be interoperable with those produced with the 'generalist' MAP. The advantage of a specialised MAP is that it need only be used for the type of resource or the type of recordings that require it. This would also limit the number specialised elements and refinements available in the most commonly used MAP. In the future, the generalist MAP could be used as a core from which more specialised MAPs could be developed to suit specialist purposes or resources with intrinsic description requirements. A second Quinkan MAP could easily be drafted that follows the EPA database structure and added to the Quinkan Matchbox registry.

Discussion

"You cannot learn, through common sense, *how things are*: you can only discover *where they fit* into the existing scheme of things"
S. Hall, 1977 in D. Hebdige, *Subculture: the meaning of style*, 1979, p. 11

CHAPTER 7: LOCALISATION

Testing has suggested that a number of modifications are needed in order to make the Quinkan MAP both more localised and accommodating of the specificity of the data originating from future partners. However, this simple testing falls well short of demonstrating inter-operability. This must be further proven with testing the export/import function of the Matchbox system with real records obtained from potential partner organisations. A functional user interface, complete with search, browse and record display could also assist in establishing that items and collections level items can be related, and that original and surrogate resources can be related yet differentiated. The same real records should be used to test the ordering of resources according to a Quinkan taxonomy.

Although this research set out to write 'the' Quinkan MAP, it is clearer now this iteration is only one of many. In fact, the Quinkan MAP is likely to remain a work-in-progress, enriched by each round of consultation and each new partnership, for many years to come. At this stage of its development, the MAP is a base from which to define more local rules and imagine more facets to represent the Quinkan information. Schemata can be validated automatically and inter-operability can be demonstrated as the development of Matchbox continues. But, it is proving impossible to design a profile that is 'true to Country' without engaging with the Country itself and its custodians. The proposed MAP needs community endorsement. It also requires the contribution of local terms and values. These adjustments should be a test of the flexibility and adaptability of the application profile concept. They are also necessary steps towards addressing the

limitations encountered during fieldwork: how do outsiders gain sufficient knowledge about a place and turn it into a MAP likely to satisfy real needs.

Indigenous knowledge is embedded in the community and is unique to a given culture, location or society (von Liebenstein, 2000). It is also a 'living entity' that seldom remains static in form or fixed in time. If information is to be relevant to such a community, the descriptions and organisation of resources must reflect as faithfully as possible the local 'world views'. Indigenous knowledge is also personal and often access to knowledge is either restricted or strongly regulated. In sharp contrast, the Western knowledge agenda leans towards the global and hegemonic.

The Western agenda is well served by the building of large, interoperable networks of information and the increasing standardisation of knowledge representation. Indigenous preferences and demands are often obfuscated in this process. The Quinkan MAP is located at the intersection of two seemingly contradictory currents: global inter-operability and local specificity. Standards deal with these issues through internationalisation and localisation[13], but these processes often work at cross-purposes (Duval et al., 2002). Global discovery is best served by internationalisation and the adoption of general conventions and terminology. Meanwhile, the needs of any community (be it a cultural or an intellectual community) are best served by the adoption of local conventions. This tension is familiar to the Dublin Core community.

DCMES started as a simple, cross-domain set of elements but it has evolved into a more complex set with the adoption of qualifiers. The initiative is also responding to the

[13] "Localization pertains to re-representation of global technology into particular cultures, local markets or locales". (Duncker, 2002)

expectations of specific communities with the design of specialised application profiles. As greater granularity is required, the modularity of DCMES can be called upon to support the integration of more specialised metadata sets or the introduction of local usage refinements (Gilliland-Swetland, 2000). Bearing in mind that Indigenous cultures are highly localised, the modularity principle should be applied to support the design of a uniquely Quinkan profile that seeks to integrate local vernacular and concepts and new elements borrowed from other metadata sets (or profiles) while retaining inter-operability at a global level. The tension between being local and global is played out throughout the MAP, and especially in the areas of resource indexing and classification.

Classifying and ordering

Subject terms are crucial to information retrieval as they are used to derive both browse categories and also search words. Subject terms are usually chosen from bibliographic classification vocabularies. Bibliographic classifications represent aspects (or facets) of knowledge. They are usually able to express not just the knowledge, but also its form, its language, the instantiation of the particular subject within some document like object (Slavic, 2000). The classification category supplies the context in which the aspect of the knowledge described is to be understood. The DCMES recommends the use of universal classification systems for the Subject element, including Dewey Decimal Classification ([DDC]), Library of Congress Subject Headings ([LCSH]) and the Arts and Architecture Thesaurus (AAT), all widely accepted in the library community.

Classification systems are biased, reflect dominant social constructs and leave little space for minority viewpoints (Olson, 1998; Star, 1998). Olson’s analysis of DDC

evidenced its strong North American, white Anglo-Saxon protestant bias. For example, it allocates 80 percent of its religion section (the 200s) exclusively to Christianity. It also creates a separate section for American literature (the 810s) when all other literatures are arranged by language. The cartography metaphor is used by Olson to demonstrate that classification is about spatial ordering, since it is used to place concepts in proximity to each other. But classification will necessarily reflect the natural association of things in real life society according to dominant values. Olson (1998) cites the example of the term "colonialism", which DDC places in the context of population movement and migration, whereas *A Women's Thesaurus*[14] frames it within "imperialism" and "apartheid".

Spatial ordering also means that maps of the same area can be differently constructed depending on cultural discourses. There is evidence to suggest that Indigenous and Western mappings of geographical areas are different, yet overlapping (Brody, 1981; Strang, 1997) (Also N. Green and B. Schebeck, personal communications, 2003). The hand-drawn maps of Malarndarri camp (N. T.) produced by local Aboriginal residents at the request of Baker (1999) differed markedly on the basis of gender. The men's map centred on the river and the paths for canoe travel, while the women's map centred on the church and showed family groupings.

A possible way to redress the bias of universal classificatory systems is to use specialist vocabularies, specially designed to represent "marginalized knowledge domains" or as Olson suggests, to open up "paradoxical spaces" in dominant classification systems by re-contextualising some subject headers. In the case of highly

[14] Capek, M. E. S. (Ed.). (1987). *A women's thesaurus.* New York: Harper & Row.

localised knowledge systems, it may be worth investigating classification categories that emerge from the ‘field’.

Star (1998) has compared grounded theory with Ranganathan's construction of faceted classifications in library and information science. Her paper centres on the relevance of the methodologies as tools for research and analysis in the social sciences, but her remarks can also be considered in the context of Indigenous research. First, she notes that both methods were created as a reaction against “powerfully entrenched schemes with claims on universality” and they share a common struggle to “represent vernacular words and processes” (Introduction). As she sums up the possibilities offered by these new tools, she also seems to describe the tension inherent in the Quinkan situation: “The contradiction comes with the attempt simultaneously to represent, on the one hand, the local, specific, and empirical and on the other, abstractions and generalizations. The difficulty lies in making this representation both ethnographically faithful (faithful to the needs of users and particular populations), yet simultaneously powerful beyond the single instance or case study” (Star, 1998, Common ground section).

The application of grounded theory to the Quinkan field would be appropriate, as it would allow local categories and vernacular to emerge, from which a structure to classify resources (or to build relationships between them) could be built. In order to open up Olson’s proposed “paradoxical spaces”, the Quinkan classification would have to be mapped back to a mainstream, universal system, like DDC.

Generating these grounded classifications would require moving the research from the field of information management to that of cultural (or perhaps anthropological)

investigation. This is a move that the current project team has no qualification or any mandate from the Quinkan community to undertake. Considering the restrictions imposed on such research by what is generally known as the ‘politics of knowledge’ in the Indigenous context, it is unlikely that useable categories would emerge within the short time frame of the Quinkan Matchbox research project. At this point, the researcher considered her outsider status, the difficulty of doing fieldwork as well as the limits on data gathering imposed by time, cultural restrictions and the difficulty of finding a common language.

Although the research is unfolding with the support of the community, little time is available for consulting or simply sharing common experiences. Relationship of trust and friendship are only in the early beginnings. So, with due acknowledgment of these limitations, this research can only venture suggestions and proposals to localise the MAP. The proposed local vernacular and classification are inspired by meagre readings about the region and its people. They constitute many options that will help in the building of a working prototype of the Quinkan Matchbox. The present research can use automatic validators and cross-walks to check the proposed schema’s compliance to standards and inter-operability. When the time comes, proposals for the localisation of the MAP will have to be validated (or rejected) by the Quinkan community.

A thematic approach to Australian history has been proposed by the Australian Heritage Commission ([AHC], 2001). The Commission has devised an Australian historic themes framework to be used in the assessment and management of heritage. It is a three-tier national ‘themescape’, open to regionalisation and localisation. The intention of the authors was to break the hegemony of the traditional range of historical themes in

conservation in Australia. The framework was tested in Albury (NSW) and it proved useful to bring to the fore under-represented minority heritages (migrants, women, Indigenous) in site identification. Pritchard (2003), who tested this framework in Tasmania, contends that overriding themes still persist (namely, convict history), but that local societies had been active in introducing divergent themes. Still, Pritchard supports the thematic approach to heritage identification and interpretation because characterisation by type allows for comparison and relation. This approach allows assessors to break away from management demands of Registers and their focus on significance and value.

An attempt to use the AHC framework as a base from which to flesh out Quinkan specific categories was marred by lack of local knowledge. A brief article about the history of south east Cape York was used to suggest themes for testing, such as timber, Chinese, pearling, and pastoral leases (Ruig & Morwood, 1995). These categories were first implemented in MAP v. 5.0 in Coverage as a way to express temporal coverage as text. It was also envisaged that cyclical events could be described in ways other than specific dates or periods (Laura Dance Festival, seasons, life-cycle events, Laura races and others). The AHC national framework provided useful prompts, but as the Quinkan draft taxonomy evolved, it moved further away from the original three tiers of the AHC framework. Members of the Quinkan community may suggest more appropriate themes. Other themes may emerge ‘naturally’ from the initial pool of catalogued resources. In time, the taxonomy-building exercise may follow closely the methodology and processes used for the interpretive centre being built in Laura.

Localised vernacular

The absence of an Indigenous 'vernacular' was Moorcroft's concern when she described the inadequacy and cultural insensitivity of controlled vocabularies used by Australian information services (Moorcroft, 1993, 1992). Her criticism targeted indexing tools such as LCSH, ASCIS (Australian Schools Catalogue Information Service), LASH (List of Australian Subject Headings) and APAIS (Australian Public Affairs Information Service). She argued they were imbued in Western concepts and prejudice and they contributed to the creation of an unwarranted "otherness" for Indigenous resources. She gave examples, such as the indexing of Aboriginal Studies resources under "Law, Primitive". She also noted that studies about Aboriginal adolescence are located in an Aboriginal 'space' rather than co-located in the 'Adolescence' space. In addition, some subject headers can hide "uncomfortable information" or make it inaccessible. Issues of genocide are softened under the header of "Race relations". The struggle for land rights is diffused under "Aborigines Australian -- Land Tenure" (Moorcroft, 1992).

Moorcroft's response was to produce the Australian and Torres Straits Islanders Thesaurus (ATSIT) with Garwood and to suggest alternative terms that are both relevant and culturally sensitive. Moorcroft and Garwood (1997) introduce the thesaurus as having "a very broad focus which includes schools, universities and the general community. The thesaurus is not a classification scheme and it is assumed that users will be Australian, working within the context of Australian materials. It may be deployed to complement LCSH or it can be used on its own, when the focus of the collection is Indigenous" (p. ix).

Moorcroft and Garwood quote from Walsh (1993) to assert that “every languages classifies the world in some way and the classification reflects the way in which the speakers see the world” (p. 107). In their introduction to the thesaurus Moorcroft and Garwood admit the limitation of their work in redressing the imbalance of Western classificatory languages by recognising that English has difficulty conveying other conceptual frameworks. Bibliographic classification (like DDC) reflects aspects of a concept and will list this concept in all disciplines in which they are studied (Slavic, 2000). But for Moorcroft and Garwood (1997), categories fail to reflect (or acknowledge) that concepts are often interrelated, complex and overlapping.

Applying the ATSI thesaurus to Quinkan resources may contribute to offering better entry points to the resources. The Mura Gadi catalogue ([MURAGADI], 2002) produced by the National Library of Australia is an example of a service using the ATSI thesaurus (albeit in a modified version) to re-index Indigenous materials (S. Thomas, Mura Gadi Librarian, personal communication, 21 January 2004). Table 13 shows the ATSI thesaurus offers a larger choice of applicable terms than LCSH for a similar resource. It increases the discoverability of the resources by providing a greater number of entry points that are also properly localised in both the Australian and Indigenous context. Its single term structure makes it also simpler to use than LCSH.

Catalogue service	NLA's main catalogue	Mura Gadi catalogue
Thesaurus	LCSH	ATSIT
Subject terms	Reynolds, Henry, 1938- Historians --Australia Authors, Australian	Aboriginal studies; Colonial policy; Dispossession; Justice; Land rights; Massacres; Mining; Missions; Native police; Pastoral industry; Policy; Race relations; Racism; Removal of children; Resistance; Self-determination; Sovereignty; Tent embassy; Terra nullius

Table 13. The record entry for Henry Reynolds' papers in the NLA's main catalogue and in the Mura Gadi catalogue.

The NLA catalogue entry is very basic, while some of the terms from the ATSIT used in the Mura Gadi catalogue could have LCSH counterparts. Terms like "Native police" would have an LCSH match in "Native Police Corps". The term "Pastoral industry" would become "Cattle industry". However, the term "Land rights" has no match, neither have "Terra Nullius" and "Tent embassy" as they describe uniquely Australian concepts and events.

The removal of children, known in Australia, as "the stolen generation" also provides an interesting point of comparison between two indexing vocabularies. The autobiography of Margaret Tucker *If everyone cared* receives the following treatment:

NLA's main catalogue	Mura Gadi catalogue
• Tucker, Margaret, 1904- • Aborigines, Australian--New South Wales--Biography.	Activism; Domestic servants; Identity; Removal of children

Table 14. The record entry for Margaret Tucker's book *If everyone cared* in the NLA's main catalogue and in the Mura Gadi catalogue.

Moorcroft and Garwood's work is useful in that it presents a manageable list of relevant and culturally sensitive terms that can be applied across the spectrum of

Indigenous resources. But, in its own way, it is also a generalist thesaurus that may require further elaboration to suit the needs of a specific cultural group.

For want of cultural group-based 'localisation', James Cook University's North Queensland Collections resort to 'regionalisation' of subject vocabulary. This sub-collection is indexed with regionally relevant terms (see Table 15). The terms in the North Queensland Index are chosen to emphasise north Queensland subjects such as personal names, place names and species names ([JCU], 2003).

Letters from Laura: a bush schoolmaster in Cape York Peninsula, 1892-1896 / by Culpin, Millais, MacKeith, Frances	
LCSH	Nth Qld descriptors
Culpin, Millais -- Correspondence Laura Region (Qld.) -- Social life and customs	Laura -- Cape York Peninsula -- Culpin family -- Letters -- Deighton -- Olive Vale Station -- Breeza Plains Station -- Taralba Station

Table 15. A record from the JCU Library catalogue showing the use of local terms to increase the local relevance of subject indexing.

These terms are natural language terms extracted from the resources being catalogued and do not represent a formally constructed thesaurus. They represent, however, a critical mass of terms relevant to the north Queensland region. This mass could be used as a list of preferred "keywords", notwithstanding the necessity to keep adding new terms to it, to index the resources of the Quinkan Matchbox. It could be used as a source of local keywords and also an alternative source of personal names, species names and place names (but lacking in authority). A list of such keywords currently used in the JCU library catalogue shows that the terms are not descriptors in the strictest sense. There is a lack of consistency in the spelling of words and numerous repetitions. For example, corporate names appear as acronyms and full text. Some terms extracted from the resources (e. g., Aboriginal legends) would now be regarded as insensitive, but they

could be replaced by terms chosen from the ATSIT thesaurus (e.g., Creation stories) or by new terms selected by the Indigenous users of the system. Unlike a properly constructed thesaurus, there is no notation to indicate the relationships (broader, narrower, use, use for) between terms.

The construction of an ad hoc thesaurus for the Quinkan Matchbox is outside the scope (temporal and financial) of the research project. It is possible to envisage, however, a future exercise in which the ATSI Thesaurus and the NQ Index could be combined and rationalised to form a Quinkan MatchboxThesaurus. This proposal draws heavily from the work undertaken by the University of Oregon Libraries when cataloguing the Major Lee Moorhouse Collection of photographs of Native Americans. A controlled vocabulary was developed by the project team, by first mapping the terms used in legacy catalogues to the Thesaurus of Graphic Materials I ([TGM-I], 1995). Whenever no appropriate term could be mapped to TGM I, a term from LCSH was chosen instead. If no LCSH was found, the term from the legacy system was added to the controlled vocabulary. In addition, the project team held on to an other list of terms (the WPA List) that provided rich subject indexing for the people, places and events depicted in the photographs (Harper, Georgitis, & Hixson, 2003) .

If the exercise described above were ever to take place, the Australian Pictures Thesaurus ([APT]) would also be a strong contender for consideration. “The APT is designed with pictorial and other original materials collections in mind and not particularly video, audio or text. Its identity emerges from original materials collections, so the terms reflect those types of collections more, and it's more relevant to that type of collection. While the APT can be used to describe the ‘aboutness’ of collections as well

as literally what the images are ‘of’, issues of aboutness can lead to more abstract terms and this is not the strength of the thesaurus” (A. Kingscote, APT Coordinator, personal communication, 18 March 2003). The APT does not accept idiomatic terms that are not understood nationally, but it accepts broadly recognised Australianisms (thongs, dunnies). APT also recognises ATSIT and the Macquarie Dictionary as authority for Aboriginal terms and Aboriginal English. It is the preferred Thesaurus for PictureAustralia. At present it is not particularly strong in terms for object names (like dilly bags). These terms may be found in a museum thesaurus, like the Australian-based Powerhouse Museum thesaurus or the broader AAT (recommended by DCMES). It must be noted that gathering of local terms can also be discreet, by simply allowing local users to enter their own natural language terms in a free-text area of the cataloguing module.

The Language element requires localisation as well. The ISO 639-2 list of languages recommended by DCMES does not contain any Australian Indigenous languages ([ISO-639-2], 2002). In the catalogue of the Australian Institute Aboriginal and Torres Straits Islander Studies, the preferred term for a given language name is linked to secondary records containing spelling variations and naming variations (e.g., 60 variations for one particular example), in order to provide maximum discoverability. The Language authorities are based primarily on the work of anthropologists and linguists such as Tindale and Dixon who have built major linguistic typologies.

Matters of date and spatial and temporal coverage of a resource also need special vernacular. The literature has underlined that Indigenous people are not necessarily interested in chronology and linearity of time to the extent that archaeologists might be. Barker and Gaston (2003) have described how people in the Whitsundays use broad

categories for the past (e.g., before people, long time before). They advocate inclusiveness in the interpretive process and assert that research work can adopt the oral information (and its broad, non-linear categories) while archaeology can provide the temporal component.

Baker (1999) points out that Yanyuwa people classify their history in a succession of 'times': Macassan times, wild times, police times, war times and more. These times were used as one of the organising schemes for their "Land is life" Web site ([Yanyuwa]). Like many Indigenous people of the Tropical north of Australia, Yanyuwa people divide the year in five, not two, seasons (Baker, R., 1999; [IWK], 2003). A five seasons cycle has also been documented for the Quinkan region and it can be mapped back to the months of the 'European' calendar. This short scheme has been included in the Quinkan MAP (v 5.0.) in the hope to make both the discovery and classification of resources more intuitive to local Indigenous people, while at the same time retaining a discreet correspondence to a twelve months cycle. It comprises values such as Kamba (proper wet time) from May to December, or Buluriji (cold time) from June to September (George & Musgrave, 1995).

Telling a better story or telling more stories

In her presentation of Getty vocabularies, Lanzi (1998) states: "the information created about art and material culture materials provides the interpretation and context necessary to *tell a story*" (Tutorial, Chap. 1, section 2). Stories can help to make factual information more meaningful and accessible to hard-to-reach audiences". Cameron (2003) suggests the needs of online users would be better served if new ways of fielding (or coding) data could be used to deliver new functionality. Cameron also notes that

recent documentation practices are already moving away from long descriptions to statements of significance. She describes this as a fundamental paradigm shift. Traditionally, museum documentation is about making empirical statements about resources, such as measurements, description or location. These statements serve to expose “a definitive meaning of the past that is deemed to lie dormant in material objects”. For Cameron, this is akin to privileging a single, hegemonic narrative. In the introduction to the ATSI Thesaurus, Moorcroft and Garwood assert that “standard English tends to focus on the properties of things – measuring and specifying, controlling and analysing, working out new ideas, and organising them (Christie & Yunupingu, 1987) whereas Aboriginal languages focus on the qualities of things – on people, and how they relate to each other, on land and spiritual ideas, and the connections between them” (Moorcroft & Garwood, 1997, p. vii).

The empirical paradigm can be discerned in DCMES metadata, which supports short, machine-readable descriptive statements about resources. This is a reminder that cataloguing was never intended as literary criticism. Cameron interprets the shift from descriptions to significance statements as the integration of the post-structuralist, post-modernist paradigms, whereby empirical, objective statements can exist alongside multiple, more subjective, interpretive narratives. For instance, Cameron (2003) shares the opinion expressed by Cole (Field notes, 2002) that disciplinary perspectives and research questions will greatly influence the kind of questions asked of an object. This implies that collections and information should be presented “as temporarily situated expert opinions through authoring and dating” (Addressing section).

Typically, curatorial notes accompanying exhibitions are new resources created to shed a new light on resources at a point in time and for a particular purpose. Unlike their factual counterparts, these descriptions may have a limited validity-span. For Cameron, the post-modern principles could be shown through disclaimers, authored text and linked curatorial essays. For the application profile designer, this begs the question of the syntax and semantics required for the description, discovery and re-use of these interpretive statements.

The Illinois Digital Cultural Heritage Community project decided to introduce an Interpretation refinement to the Description element of their application profile (Bennett, Sandore, & Pianfetti, 2002). The RNE database routinely includes significance statements in its descriptions of registered places. Adding an interpretive refinement may bring a little bit of life into the object description, but it does not really break the tradition of single, hegemonic statements about resources. The relation element could be used to refer the user to external, related documents. This too has limitations, because of the lack of a facility for bi- or multi-directional linking. Proper DCMES implementation would require that related documentation were described fully in a separate record. The extremely long narrative essays found in AMOL, the Mura Gadi catalogue and RNE records are rich in contextual information (significance statements, background information, biographical and historical notes) that remains under-exploited in the Description element. These narratives could be better exploited as separate (but linked) resources, and some of the information they contain (places, people, events) could then be indexed.

Cameron also suggests that museums should review the kind of information they capture about resources, especially at acquisition time. Her suggestion is consistent with Larson (1998), quoted by Holland and Smith (1999, Native American cultural heritage, para. 3) who describes the advantage of having a central repository of cultural materials as allowing them to be contextualised, either by their creators, the donators or by experts. These remarks have been validated by staff at AIATSIS and NMA, who regularly call on visiting Elders to provide clues about objects held in their vaults. This is further corroborated by the workshop held in 1999 with Quinkan Elders, when the showing of a video about a honey tree elicited a flow of cultural information ([Matchbox], 2002).

A possible solution for formalising the relationship between factual and interpretive statement may be the use of the Annotation schema developed by W3C ([Annotea], 2001). Annotations are defined as "comments, notes, explanations, or other types of external remarks that can be attached to any Web document or a selected part of the document without actually needing to touch the document" ([Annotea], 2001, Overview section). Annotations are stored as metadata and related to the resource they annotate. In her proposal for the NDSL[15], Hillmann (2002) has created a Type element for annotations, destined to record the intention of the author. Its suggested values comprise 'explanation', 'comment', 'change' or 'question'. Annotations do not modify the factual descriptive content, they add to it while being located in a distinct place. The identity of the recorder is noted as well as the date. The expert opinion is therefore situated through "authoring and dating" as requested by Cameron (2003). Annotation

[15] National Digital Science Library

could be one means of recording and delivering to users the plurality of meaning that so many cultural heritage professionals deem essential to their work practices[16].

The integration of the Annotation schema is out of the scope of this research, but it deserves future investigation as a possible means of delivering to the users of the Quinkan Matchbox, the rich pickings of such as the 'Honey Tree' anecdote ([Matchbox], 2002).

A Quinkan ontology?

In her paper on marginalized knowledge, Olson (1998) quotes from Sayers[17], who wrote in 1926 "A classification scheme is really a map of knowledge.... A general classification is, then, a map of the universe within and without the mind of man; it covers all things we may have known, know or can know. In the language of metaphysics it covers all being". Forty years later, Sayers ventured a new definition: "[A classification's] task is to provide for the field of knowledge or part of it, as comprehensive and clear a statement as the cartographer is able to make of a territory of the earth. For just as a map makes clear the relationship between place and place so a classification strives to show the relationship of each branch of knowledge to the other branches". Sayers wrote from the point of view of a believer in a single, universal classification. Since then, other theoretical frameworks have been developed (like post-structuralism) that have demonstrated that multiple realities exist and that classification schemata are socially constructed.

[16] Cameron also remarks that multiple views can also be supported by the extension of existing thesaurii, nomenclatures and glossaries.

[17] Sayers, B. (1926; 1967) *Manual of Classification* (original source not consulted).

Classifications are often represented by uni-dimensional, hierarchical structures, often trees. As such, they reduce a multi-dimensional space to a uni-dimensional one, and relationships between categories or concepts are lost. What Sayers describes is known in the language of metaphysics as ‘ontology’. In the computer science world, an ontology is “an explicit formal specification of how to represent the objects, concepts and other entities that are assumed to exist in some area of interest and the relationships that hold among them” ([FOLDOC], 2004). The development of ontologies is ‘technically’ possible. Computer science has built tools, methods and syntaxes for this purpose. In reality, it also requires extensive knowledge and understanding of a given domain. A Quinkan ontology is perhaps the ultimate prize, but one that will remain elusive, for want of protocols to share (and protect) knowledge.

CONCLUSION

> Let us not begin at the beginning, nor even at the archive.
> But rather at the word "archive" — and with the archive of so familiar a word. *Arkhe*, we recall, names at once the *commencement* and the *commandment*. This name apparently coordinates two principles in one: the principle according to nature or history, *there* where things *commence*—physical, historical, or ontological principle— but also the principle according to the law, *there* where men and gods *command*, *there* where authority, social order are exercised, *in this place* from which order is given—nomological principle.
> Jacques Derrida, 1996, *Archive fever: a Freudian impression*, p. 1[18]

[18] The use of this quotation was suggested by Meyer (2004) in her paper describing the activities of the Centre for Popular Memory in Cape Town (South Africa). Many of the issues raised by the digitising of African oral histories, namely intellectual property, community property, cultural representation in a globalised world and access to technology, can find an echo in the context of Indigenous Australia.

Taking into account Indigenous people's holistic view on heritage has led to a reappraisal of the possible purpose and content of the Quinkan Matchbox. It has contributed to the motivation to expand the Quinkan metadata application profile to describe more than just Rock Art. The modularity and extensibility principles of metadata have been used to produce a proposed application profile that can be validated as DCMES compliant. Refinements and vocabularies have been introduced that attempt to give a local flavour to the MAP. Metadata sets used in the cultural heritage domain and the user interface of catalogues of prominent cultural institutions have also contributed to the overall design of the Quinkan MAP. Testing, despite the limitations of the environment in which it was conducted, has shown that records from a number of identified repositories could be input without significant loss. After examination of these repositories, new element refinements were introduced into the MAP to increase the compatibility of the Quinkan schema. These refinements are representative of description requirements intrinsic to the resources or dictated by the practices of specific disciplines. Once included in the MAP, they can be used to describe Quinkan resources in a consistent and useful way.

At this stage, the MAP is a base from which to define more local rules and imagine more facets to represent the Quinkan information. The insufficient (for now) interaction with the Quinkan community (and the associated methodological and ethical hurdles) makes it presumptuous to assume the current MAP truly reflects the Quinkan worldview or the view from Laura. Research on the role of classifications and vocabularies has shown these tools are not culturally neutral. They serve to shape the view of the (cultural) landscape according to a dominant paradigm that is seldom that of

Indigenous people. In order to redress this imbalance it is necessary to introduce vocabularies and classifications that are suggested by Quinkan community members (or at least endorsed by them) or that are derived from an intimate familiarity with the Quinkan world. In time, these vocabularies and classifications could be related to a common reference (DDC or other), so as to wedge a Quinkan space into a global framework. This would also ensure that the Quinkan Matchbox retains a necessary level of inter-operability with other systems (or at least, that records can be easily exchanged to and from other systems). Specific resources or practices may call for an increased level of metadata granularity. Specialised MAPs could be developed that retain inter-operability with the main MAP for the purpose of resource discovery but support other functions, like management, monitoring of site condition, rights tracking and many more. The registry approach to developing application profiles, as proposed by Wagner and Heery (2002), might help grow the system for specialised schemata or non-DC additions. At present, adhesion to DC means that the 'cost' of participating in the Quinkan collective remains low, as non-DC records can be 'easily' cross-walked. The lack of import facility in the test environment did not allow this research to ascertain if non-DC records could be imported. Rather, their 'input-ability' was tested and the map was adjusted accordingly. As the development of the Quinkan Matchbox progresses, planning for future work must include a more robust testing of the inter-operability of the profile with data sets produced externally. At the time of writing this thesis, this was planned to begin in May-June 2004. The level of loss or distortion endured by the records as they are imported into Matchbox must be assessed and the design of the MAP may need adjusting. A number of agencies that have been approached to supply test data sets have

expressed their interest in the test outcomes, with view to adjusting their own record structure (as required). This would complete the third step of the ARH framework designed by Currie et al. (2002) as “Harmonisation”. Further adjusting may also include the addition of new elements and their refinements in order to welcome new partners in the collective or to suit new purposes.

It is unlikely that the Quinkan community can consider any kind of complex technical solution for the population of their repository. With the implementation of an export/import function, it would be possible to envisage that each future ‘bulk’ contributor to the Quinkan collection is asked to write its own cross-walk (or logical transformation) from its source schema to the target Quinkan schema. Alternatively, a Quinkan-endorsed information manager could provide a mapping service. Exporting metadata produced with the Quinkan MAP to a repository like PictureAustralia is also a test that needs to be undertaken. The metadata would be exported as DC (simple) and would lose most of its Quinkan specificity. This process would be useful in testing that Quinkan Matchbox-produced metadata can be satisfactorily exported and that it abides by PictureAustralia’s stringent data entry guidelines. The MAP will initially produce metadata in XML syntax. But it is very likely that RDF will be needed to offer the level of flexibility required by Indigenous cultural doings. Rights and authentication are part of exercising control over cultural resources and particular attention must be paid to mapping the layers of rights and permission in Matchbox to the complex network of relationships that exist in the Quinkan community. Overall, the input, feedback and validation of the Quinkan people in the design and constant re-adjustment of the MAP are essential.

More work is also required to generate a taxonomy for the Quinkan Matchbox. The role an outsider can play in this process remains unclear. The work undertaken by a young cultural recordist (Hodge, 2004), with his unique insight and access to Quinkan cultural knowledge could represent the next building block towards preserving and presenting the Quinkan world in a truthful manner. Taxonomies are fixed representations of a certain way of ordering the past. When Gundestrup and Manning (2004) worked on the online exhibition of the objects held in the King's Kunstkammer[19], they were all too aware that "there is no eternal truth about how to organise the world". They decided to present the objects online in boxes labelled in the most non-traditional way (shiny objects, objects with feathers). Online users were then invited to create their own exhibition by placing the objects in new boxes and to create their own rules about ordering the collection. These user-created exhibitions were kept for 30 days. As such, they could be regarded as the personal truth of a user-curator for a limited period of time. This simple 'click and drag' method of ordering and labelling boxes could have an application in the Quinkan context and support the design of a soft 'do-it-yourself' taxonomy, that would by-pass the cumbersome investigative process of cultural research.

Cultural representation is linked to issues of research methodology and user interface design. Baker (1999) advances that the human-land focus of cultural geography can provide an important framework within which it is possible to document the environmental knowledge of Aboriginal people and that many aspects of Aboriginal

[19] The original Danish Royal Kunstkammer was established around 1650 by King Frederik III. In the mid-19th century, its 10,000 objects were dispersed across newly established specialised museums of art, history and natural sciences.

history are best studied by mapping. Maps can be used to show not only the geography of a place, but also its history, with, for instance, “the changing patterns of Aboriginal and non-Aboriginal land use, settlement patterns” (p. 46). Baker also cites ‘mental maps’ as tools for “exploring how different people see landscape in different ways” (p. 46). Turnbull and Watson (1989) advance the idea that maps are ideal visualisation tools for deeply ingrained cognitive schemata. “In the case of maps, the idea that our ability to understand the world is dependent on modes of ordering of which we are at best partially aware is of particular interest. As concrete examples they provide an opportunity for bringing such cognitive schemata to the fore, and they also provide an opportunity to explore the claim that is the deepest possible way knowledge is inherently spatial, and embedded in practical action” (pp 48-49). The scope of this research did not encompass possible user interfaces for the Quinkan Matchbox. The literature strongly suggests that a map interface may be a strong contender to represent the deep and over-lapping layers of knowledge and stories that make up Quinkan country.

The drafting of a metadata application profile is only one step towards the realisation of the vision of a collective as expressed by Holland and Smith (1999). Entering into partnerships with universities for training information gatherers and technical support staff will greatly enhance the sustainability of this cultural recording project (Mortimer, 2000; Worcman, 2002). Providing users with a service that is easy to use and can be reliably maintained will, to some extent, contribute to easy acceptance and growth (Batty, 1993; Buchtmann, 2000). Curatorial initiatives and legal agreements need to be put in place so that resources can be contributed to the repository, either by way of metadata transfer, return of digital surrogates or by way of annotation of existing

resources. Engagement of the community with this tool is essential. Although the Quinkan Matchbox project was launched at the initiative and with the support of the community, success and acceptance are not guaranteed. The Quinkan Matchbox requires double scrutiny. First, ethical and 'political' considerations beg the question: should a project like this one ever be undertaken? Having taken the leap, the next set of questions awaits. Was it worthwhile? Was it successful? How did it affect the community? In 1986, Michaels defined three different models in Aboriginal development in media and used them to clarify the relationships between ideology and media. In the "cultural maintenance" model "the Law remains strong and the role of Europeans assisting in development is to help that the Law remain strong" (p. xvi). The relevance and usefulness of the Quinkan Matchbox as a cultural tool will be fully realised if it can be woven into cultural practices and assist the Quinkan community in affirming its sense of identity.

REFERENCES

[AAT]. (2000). *Art & Architecture Thesaurus*, 2004, from http://www.getty.edu/research/tools/vocabulary/aat/

[ABC]. (2003, 12 June). *Aboriginal 'knowledge centre' to protect sacred objects*, 2004, from http://www.abc.net.au/message/news/stories/ms_news_877681.htm

[ACMI-Coll].*ACMI Lending collection*, 2004, from http://www.acmi.net.au/lending.htm

[ACMI]. (2003). *ngarinyin pathways dulwan*, 2003, from http://www.acmi.net.au/pathways.jsp

[AGLS]. (2000). *Australian Government Locator Service (AGLS) introduction*, 2002, from http://www.naa.gov.au/recordkeeping/gov_online/agls/summary.html

Ah Kit, J. (1995). Aboriginal aspirations for heritage conservation. *Historic environment*(11), 34-36.

[AHC]. (2001). *Australian Historic Themes: a framework for use in heritage assessment and management*, 2003, from http://www.ahc.gov.au/publications/generalpubs/framework/index.html

[AHPI]. (1999). *Australian Heritage Places Inventory (AHPI)*, 2003, from http://www.heritage.gov.au/ahpi/index.html

Allen, H. (1997). Conceptions of time in the interpretation of the Kakadu landscape. In *Tracking knowledge in North Australian landscapes: studies in Indigenous and settler ecological knowledge systems* (pp. 141-154). Canberra & Darwin: North Australia Research Unit, School of Pacific and Asian Studies, The Australian National University.

Ames, M. (1990). Cultural empowerment and museums: opening up anthropology through collaboration. In S. Pearce (Ed.), *Objects of knowledge* (pp. 158-173). London: The Athlone Press.

[Annotea]. (2001). *Annotea Project*, 2003, from http://www.w3.org/2001/Annotea/

[ANZMETA]. (2001). *ANZLIC Metadata Guidelines. Version 2 (February 2001)*, 2002, from http://www.anzlic.org.au/download.html?oid=2358011755

[APT].*Australian Pictures Thesaurus (APT)*, 2002, from http://www.picturethesaurus.gov.au/

[ARA]. (2003). *Ara Irititja: stories from a long time ago*, 2003, from http://www.irititja.com/

Arms, W. Y. (2000). *Digital libraries*, 2003, from http://www.cs.cornell.edu/wya/DigLib/MS1999/index.html

Arms, W. Y., Hillmann, D., Lagoze, C., Krafft, D., Marisa, R., Saylor, J., et al. (2002). *A spectrum of interoperability: the site for science prototype for the NSDL*, 2003, from http://www.dlib.org/dlib/january02/arms/01arms.html

[Arts-Qld]. (2003). *Creative Queensland: progress report 2003: Queensland Government Cultural Policy*, 2003, from http://www.arts.qld.gov.au/pdf/creative_qld_progress-FINAL_NO_SIGNATURES.pdf

[AUMOL].*Australian Universities Museums Online (AUMOL)*, 2002, from http://aumol.usyd.edu.au

Avison, D. E., & Fitzgerald, G. (1995). *Information systems development: methodologies, techniques and tools* (2nd ed.). London: McGraw-Hill.

Baca, M., & Harpring, P. (2000). *Categories for the Description of Works of Art (CDWA)*, from http://www.getty.edu/research/conducting_research/standards/cdwa/

Baker, R. (1999). Land is life: a cultural geography of Australian contact history. In E. Stratford (Ed.), *Australian Cultural Geographies* (pp. 25-47). South Melbourne, Vic.: Oxford University Press.

Baker, T. (2000a). *A Grammar for Dublin Core*, 2002, from http://dlib.org/dlib/october00/baker/10baker.html

Baker, T. (2000b, 19 October). *STRAWMAN: Profile requirements*, 2003, from http://www.jiscmail.ac.uk/cgi-bin/wa.exe?A2=ind0010&L=dc-registry&P=R564&I=-1

Barker, B., & Gaston, J. (2003). *Hierarchies of knowledge and the tyranny of text: archaeology, ethnohistory and oral traditions in Australian archaeological interpretation*, 2003, from http://godot.unisa.edu.au/wac/pdfs/29.pdf

Batty, P. (1993). Singing the electric: Aboriginal television in Australia. In T. Dowmunt (Ed.), *Channels of resistance: global television and local empowerment* (pp. 106-125). London: BFI.

Bearman, D., & Trant, J. (1999). *A common model to support interoperable metadata: progress report on reconciling metadata requirements from the Dublin Core and INDECS/DOI communities*, 2002, from http://www.dlib.org/dlib/january99/bearman/01bearman.html

Bennett, N. A., Sandore, B., & Pianfetti, E. S. (2002). *Illinois Digital Cultural Heritage Community - collaborative interactions among libraries, museums and elementary schools*, 2003, from http://www.dlib.org/dlib/january02/bennett/01bennett.html

[Berdnt]. (2003a). *Bringing the Photographs Home Project*, 2003, from http://www.berndt.uwa.edu.au/

[Berdnt]. (2003b). *Search Berdnt Museum*, 2003, from http://www.berndt.uwa.edu.au/Berndt/Search.lasso

Besser, H. (2002). *Moving from isolated digital collections to interoperable digital libraries.* Paper presented at the Victorian Association for Library Automation (VALA), Melbourne, 8 February, 2002.

Bolton, L. (2003). The object in view: Aborigines, Melanesians and museums. In L. Peers & A. K. Brown (Eds.), *Museums and source communities: a Routledge reader* (pp. 42-54). London: Routlege.

Brascoupe, S., & Mann, H. (2001, 2002). *A community guide to protecting Indigenous knowledge*, 2004, from http://www.ainc-inac.gc.ca/pr/ra/ind/gui_e.html

Brody, H. (1981). *Maps and dreams: Indians and the British Columbia frontier*. Vancouver: Douglas & McIntyre.

Buchtmann, L. (2000). Digital songlines: the use of modern communication technology by an Aboriginal community in remote Australia. *Prometheus, 18*(1), 59-74.

Byrne, D. (1991). Western hegemony in archaeological heritage management. *History and Anthropology*(5), 269-276.

Byrne, D., Brayshaw, H., & Ireland, T. (2001). *Social significance: a discussion paper*. Hurstville, N.S.W.: NSW National Parks and Wildlife Service.

Cameron, F. (2003). *The next generation — 'Knowledge Environments' and digital collections*, 2003, from http://www.archimuse.com/mw2003/papers/cameron/cameron.html

[CHIN]. (2002). *General metadata standards for resource discovery*, 2003, from http://www.chin.gc.ca/English/Standards/metadata_discovery.html

[CIMI]. (2000). *The CIMI experience: a commentary on working with qualifiers for the Dublin Core Metadata Element Set*, 2003, from http://www.cimi.org/public_docs/TBK_DCQ_Commentary_v5_0700.rtf

[CIMI]. (2002). *Consortium for the Computer Interchange of Museum Information (CIMI Consortium)*, 2002, from http://www.cimi.org/

[CIMI]. (1999). *Guide to best practice: Dublin Core. Version 1.1. August 1999*, 2002, from http://www.cimi.org/public_docs/meta_bestprac_v1_1_210400.rtf

Clarke, S. (2001). *VRA Core 3.0 - Mapping to MARC 21 (Bibliographic Format)*, 2003, from http://php.indiana.edu/~fryp/marcmap.html

Clifford, J. (1997). Museums as contact zones. In *Routes: travel and translation in the late Twentieth century* (pp. 180-219). Cambridge, Ma.: Harvard University Press.

Cole, N. (1995). Rock Art in the Laura-Cooktown region, S. E. Cape York Peninsula. *Tempus, 3*, 51-70.

Colley, S. (2002). *Uncovering Australia: archaeology, Indigenous people and the public*. Sydney: Allen & Unwin.

[Coolcat].*Coolcat: gateway to the resources of Victorian academic and research libraries*, 2004, from http://www.coolcat.edu.au

Coombs, H. C., Brandl, M. M., & Snowdon, W. E. (1983). *A certain heritage: programs for and by Aboriginal families in Australia*. Canberra: Centre for Resource and Environmental Studies, Australian National University.

Cox, S. (2000a). *DCMI Box encoding scheme: specification of the spatial limits of a place, and methods for encoding this in a text string*, 2003, from http://dublincore.org/documents/dcmi-box/

Cox, S. (2000b). *A mapping from ANZLIC to AGLS metadata*, 2003, from http://www.naa.gov.au/recordkeeping/gov_online/agls/mapping/anzlic.html

Creamer, H. (1990). Aboriginal perceptions of the past: the implications for cultural resource management in Australia. In P. Gathercole & D. Lowenthal (Eds.), *The politics of the past* (pp. 131-140). London: Hyman and Unwin.

Currie, M., Geilesky, M., Nevile, L., & Woodman, R. (2002). *Visualising interoperability: ARH, aggregation, rationalisation, harmonisation.* Paper presented at the DC-2002: Metadata for e-communities Conference (13-17 October), Florence, Italy.

Day, M. (2002). *Metadata: mapping between metadata formats*, 2003, from http://www.ukoln.ac.uk/metadata/interoperability/

[DC-Admin]. (2003). *DCMI Administrative Metadata Working Group*, 2003, from http://dublincore.org/groups/admin/

[DC-Agents]. (2003). *DCMI Agents Working Group*, 2003, from http://dublincore.org/groups/agents/

[DC-Collections]. (2003a). *DCMI Collection Description Working Group*, 2003, from http://dublincore.org/groups/collections/

[DC-Collections]. (2003b). *Dublin Core Collection Description Application Profile Summary (proposal, 1st draft)*, 2003, from http://www.ukoln.ac.uk/metadata/dcmi/collection-ap-summary/2003-05-29/

[DC-Date]. (2004). *DCMI Date Working Group*, 2004

[DC-Government]. (2003). *DCMI Government Working Group*, 2003, from http://dublincore.org/groups/government/

[DCMES]. (2003). *Dublin Core Metadata Element Set, Version 1.1: Reference Description*, 2004, from http://dublincore.org/documents/dces/

[DCMI-WG]. (2003). *DCMI Working Groups*, 2002, from http://dublincore.org/groups/

[DCMI]. (2002). *Dublin Core Metadata Initiative*, from http://dublincore.org/

[DDC].*Dewey Decimal Classification (DDC)*, 2004, from http://www.oclc.org/dewey/index.htm

Dekkers, M. (2001). *Application profiles, or how to mix and match metadata schemas*, 2003, from http://www.cultivate-int.org/issue3/schemas/

Dempsey, L. (2000). *Scientific, industrial, and cultural heritage: a shared approach: a research framework for digital libraries, museums and archives*, 2002, from http://www.ariadne.ac.uk/issue22/dempsey/

Duncker, E. (2002). *Cross-cultural usability of the library metaphor*. Paper presented at the Joint Conference on Digital Libraries (JCDL) 2002, Portland, OR (13-17 July).

Duval, E., Hodgins, W., Sutton, S., & Weibel, S. L. (2002). *Metadata principles and practicalities*, 2003, from http://www.dlib.org/dlib/april02/weibel/04weibel.html

[EdNA]. (2003). *EdNA Online*, 2003, from http://www.edna.edu.au/edna/page1.html

Edwards, E. (2003). Talking visual histories: introduction. In L. Peers & A. K. Brown (Eds.), *Museums and source communities: a Routledge reader* (pp. 83-99). London: Routlege.

[EPA-Qld]. (2001). Indigenous Site Card Database (Version 2.0). Brisbane: Queensland Government. Environmental Protection Agency. Cultural Heritage Branch.

[ERIN]. (1995). *Areas of conservation significance on Cape York Peninsula*, 2003, from http://www.deh.gov.au/erin/cyplus/lup/index.html

Fforde, C., Hubert, J., & Turnbull, P. (Eds.). (2002). *The dead and their possessions: repatriation in principle, policy and practice*. London ; New York: Routledge.

Fienup-Riordan, A. (2003). Yup'ik Elders in Museums: fieldwork turned on its head. In L. Peers & A. K. Brown (Eds.), *Museums and source communities: a Routledge reader* (pp. 28-41). London: Routlege.

[FOLDOC]. (2004). *The Free On-line Dictionary of Computing*, 2004, from http://wombat.doc.ic.ac.uk/foldoc/

[Gazetteer]. (2004). *Place names of Australia*, 2003, from http://www.ga.gov.au/map/names/

George, T., & Musgrave, G. (1995). *Our country, our art, our Quinkans*. Laura: Ang-gnarra Aboriginal Corporation.

Gill, T. (2002). *Touring the information landscape: designing the data model for RLG Cultural Materials*, 2003, from http://www.rlg.org/r-focus/i58.html#touring

Gill, T., Grout, C., & Smith, L. (1997, 2001). *VADS information standards review*, 2002, from http://www.vads.ahds.ac.uk/reports/standards_review/info_standards.html

Gill, T., & Miller, P. (2002). *Re-inventing the wheel? Standards, interoperability and digital cultural content*, 2003, from http://www.dlib.org/dlib/january02/gill/01gill.html

Gilliland-Swetland, A. (2000). *Setting the stage*, 2002, from http://www.getty.edu/research/institute/standards/intrometadata/2_articles/index.html

Glowczewski, B. (2000). Dream trackers: Yapa art and knowledge of the Australian desert [CD-Rom]. Paris: UNESCO.

Greenberg, J., Pattuelli, M., Parsia, B., & Robertson, W. (2001). *Author-generated Dublin Core metadata for Web resources: a baseline study in an organization*, 2003, from http://jodi.ecs.soton.ac.uk/Articles/v02/i02/Greenberg

Guenther, R. (2002). *Library Application Profile*, 2003, from http://dublincore.org/documents/2002/09/24/library-application-profile/

Gundestrup, B., & Wanning, T. (2004). *The King's Kunstkammer: presenting systems of knowledge on the Web*, 2004, from http://www.archimuse.com/mw2004/papers/gundestrup/gundestrup.html

Harper, C., Georgitis, N., & Hixson, C. (2003). *Imagining the Northwest: a digital library partnership in Oregon.* Paper presented at the DC-2003 Conference: Supporting Communities of Discourse - Metadata Research and Applications, Seattle, Washington USA (28 September - 2 October).

Harpring, P., Woodley, M., Gilliland-Swetland, A., & Baca, M. (2000). *Metadata standards crosswalks*, 2002, from http://www.getty.edu/research/institute/standards/intrometadata/3_crosswalks/index.html

Harrison, R. (2000). Challenging the 'authenticity' of antiquity: contact archaeology and Native Title in Australia. In I. Lilley (Ed.), *Native title and the transformation of archaeology in the postcolonial world.* (pp. 33-53). Sydney: University of Sydney.

Havemann, P. (2000). Enmeshed in the Web? Indigenous people's rights in the network society. In S. M. Rai & R. Cohen (Eds.), *Global social movements* (pp. 18-32). London: The Athlone Press.

Healy, C. (1997). We remember for you: the memory work of museums. In *From the ruins of colonialism: history as social memory* (pp. 77-105). Cambridge ; Melbourne: Cambridge University Press.

Hearst, M., English, J., Sinha, R., Swearingen, K., & Yee, P. (2002). Finding the flow in Web site search. *Communications of the ACM, 45*(9), 42-49.

Heery, R. (2000). *What are Application Profiles: a typology of schemas*, 2003, from http://www.schemas-forum.org/workshops/ws2/ws2-presentations/APs/sld001.htm

Heery, R., & Day, M. (2002). *Application profiles: interoperable friend or foe?* Paper presented at the TEL Milestone Conference 29 - 30 April 2002, Die Deutsche Bibliothek Frankfurt am Main, Germany.

Heery, R., & Patel, M. (2000). *Application profiles: mixing and matching metadata schema*, 2003, from http://www.ariadne.ac.uk/issue25/app-profiles/intro.html

Hillman, D. (2001). *Using Dublin Core*, 2003, from http://dublincore.org/documents/usageguide/

Hillmann, D. (2003a). *NSDL metadata primer*, 2003, from http://metamanagement.comm.nsdlib.org/outline.html

Hillmann, D. (2002). *Proposed Annotation format for NSDL (based on DC and Annotea)*, 2003, from http://content.nsdl.org/annotation/AnnotationFormat.html

Hillmann, D. (2003b). *Using Dublin Core*, 2003, from http://dublincore.org/documents/2003/08/26/usageguide/

[HOA]. (2002). *The House of Aboriginality*, 2004, from http://www.mq.edu.au/hoa/

Hodge, A. (2004, 2004-01-24). The Face - Victor Steffenson, cultural recordist. *The Weekend Australian*, p. B03.

Holland, M., & Smith, K. (1999). *Broadening access to Native American collections via the Internet*, 2002, from http://www.archimuse.com/mw99/papers/holland/holland.html

House, M. (1995). Welcoming address. In *Creating Heritage Partnerships: a selection of papers from the Creating Heritage Partnerships Conference* (pp. 7-9). Canberra: National Museum.

Hunter, J., Koopman, B., & Sledge, B. (2003). *Software tools for Indigenous knowledge management*, 2003, from http://www.archimuse.com/mw2003/papers/hunter/hunter.html

[IMLS]. (2001). *A framework of guidance for building good digital collections*, 2003, from http://www.imls.gov/scripts/text.cgi?/pubs/forumframework.htm

[ISO-639-2]. (2002). *ISO 639-2 - Codes for the representation of names of languages. Alpha-3 code (ISO 639-2:1998)*, 2004, from http://www.loc.gov/standards/iso639-2/langhome.html

[ISO-8601]. (2003). *ISO 8601: Numeric representation of dates and time*, 2004, from http://www.iso.ch/iso/en/prods-services/popstds/datesandtime.html

[IWK]. (2003). *Indigenous weather knowledge*, 2004, from http://www.bom.gov.au/iwk/

Jacobs, J. (1988). The construction of identity. In J. Beckett (Ed.), *Past and present: the construction of Aboriginality* (pp. 31-43). Canberra: Canberra Aboriginal Studies Press for the Australian Institute of Aboriginal Studies.

Janke, T. (1998). *Our culture, our future*. Surry Hills, N.S.W.: Michael Frankel & Company, Solicitors, c1998.

[JCU]. (2003). *North Queensland Collection*, 2003, from http://www.library.jcu.edu.au/Specials/nqcoll.shtml

Johnston, P. (2003, 9 September). *Current issues*, 2003, from http://www.jiscmail.ac.uk/cgi-bin/wa.exe?A2=ind0309&L=dc-collections&T=0&O=A&P=2038

Kavanagh, G. (1996). *Making histories in museums*. London and New York: Leicester University Press.

[Kinetica].*Kinetica*, 2002, from http://www.nla.gov.au/kinetica/

Lagoze, C., & Fielding, D. (1998). *Defining collections in distributed digital libraries*, February 2003, from http://www.dlib.org/dlib/november98/lagoze/11lagoze.html

Langton, M. (1981). Urbanizing aborigines: the social scientists' great deception. *Social Alternatives, 2*(2), 16-22.

Langton, M. (1994). *Valuing cultures: recognising Indigenous cultures as a valued part of Australian heritage*. Canberra: Australian Government Publishing Service (AGPS).

Lanzi, E. (1998, March 2000). *Introduction to vocabularies: enhancing access to cultural heritage information*, 2003, from http://www.getty.edu/research/conducting_research/vocabularies/introvocabs/

Layton, R. R. (1995). Rereading rock art: text and discourse. In K. Helskog & B. Olsen (Eds.), *Perceiving rock art: social and political perspectives : ACRA, the Alta Conference on Rock Art* (pp. 217-227). Oslo: Institute for Comparative Reseach in Human Culture.

[LCSH].*Library of Congress Subject Headings*, 2004, from http://lcweb.loc.gov/cds/

Lee, H.-l. (2000). What is a collection? *Journal of the American Society for Information Science, 51*(12), 1106-1113.

Lightle, K. S., & Ridgway, J. S. (2003). *Generation of XML records across multiple metadata standards*, 2003, from http://www.dlib.org/dlib/september03/lightle/09lightle.html

Mansell, M. (1997). Barricading our last frontier – Aboriginal cultural and intellectual property rights. In G. Yunupingu (Ed.), *Land Rights – Past, Present, Future* (pp. 195-210). St Lucia, Qld.: Queensland University Press.

[MARC-Genre]. (2003). *MARC Value List for Genre Terms*, from http://www.loc.gov/marc/sourcecode/genre/genrelist.html

[MARC-Roles]. (2003). *MARC Value List for Relators and Roles*, 2002, from http://www.loc.gov/marc/sourcecode/relator/relatorlist.html

[MARC-to-DC]. (2001). *MARC to Dublin Core Crosswalk*, 2003, from http://www.loc.gov/marc/marc2dc.html

[Matchbox]. (2002). *ARC SPIRT Quinkan Matchbox Project*, 2002, from http://www.jcu.edu.au/rockart/

[MDA]. (2002). *SPECTRUM: The UK Museum Documentation Standard*, 2003, from http://www.mda.org.uk/spectrum.htm

Merlan, F. (2000). Representing the rainbow: Aboriginal culture in an interconnected world. *Australian Aboriginal Studies*(1 & 2), 20-26.

Meyer, R. (2004). *Digitising African oral narratives in a global arena*, 2004, from http://www.archimuse.com/mw2003/papers/meyer/meyer.html

Michaels, E. (1986). *The Aboriginal invention of television in Central Australia 1982-1986*. Canberra: Australian Institute of Aboriginal Studies.

Miller, P. (2000). *Interoperability-what is it and why should I want it?*, 2003, from http://www.ariadne.ac.uk/issue24/interoperability/intro.html

[MIME]. (2001). *Internet Media Types*, 2004, from http://www.isi.edu/in-notes/iana/assignments/media-types/media-types

Moorcroft, H. (1993). The construction of silence. *Australian Library Journal, 42*(1), 27-32.

Moorcroft, H. (1992). Ethnocentrism in subject headings. *The Australian Library Journal, 41*(1), 40-45.

Moorcroft, H., & Garwood, A. (Eds.). (1997). *Aboriginal and Torres Straits Islander Thesaurus*. Canberra: National Library of Australia.

Mortimer, M. (2000). Australian indigenous communities online. In C. Bruce, Candy, P. (Ed.), *Information literacy around the world: advances in programs and research* (pp. 99-107). Wagga Wagga, NSW: Charles Sturt University. Centre for Information Studies.

Morwood, M. J., & Hobbs, D. (Eds.). (1995). *Quinkan prehistory: the archaeology of Aboriginal art in S. E. Cape York Peninsula, Australia* (Vol. 3). St Lucia, Qld: Anthropology Museum, University of Queensland.

[MURAGADI]. (2002). *Mura Gadi: a guide to manuscript, pictorial and oral history materials relating to Aboriginal and Torres Strait Islanders in the National Library of Australia*, 2004, from http://www.nla.gov.au/muragadi/

[MURA].*MURA: the on-line catalogue of the Australian Institute of Aboriginal and Torres Strait Islander Studies*, 2002, from http://unicorn.aiatsis.gov.au/index.html

[Museum-Vic]. (2003). *Arhnem Land photographs: the Donald Thomson collection project visits Arnhem Land.*, 2003, from http://www.museum.vic.gov.au/hottopics/show.asp?ID=484

Musgrave, G., & Steffenson, V. (2000). *The Laura community: culture and the environment*, 2004, from http://www.jcu.edu.au/rockart/public_pres/AURA_2000/Victor/

Nevile, L., & Lissonnet, S. (2003). *Dublin Core: the base for an Indigenous culture environment?*, 2003, from http://www.archimuse.com/mw2003/papers/nevile/nevile.html

[NINCH]. (2002). *The NINCH guide to good practice in the digital representation and management of cultural heritage materials*, from http://www.nyu.edu/its/humanities/ninchguide/

NISO. (2001). *Dublin Core Metadata Element Set - NISO Standard Z39.85-2001 (September 2001)*, 2002, from http://www.niso.org/standards/resources/Z39-85.pdf

NLA. (2003). *Persistent identifier scheme adopted by the National Library of Australia*, 2003, from http://www.nla.gov.au/initiatives/nlapi.html

[NT-Treasury]. (2002). *Building Our Community: An overview of the Government's social initiatives, policies, programs and expenditures in the 2002-03 Budget* 2003, from http://www.nt.gov.au/ntt/financial/budget02-03/docs/boc/ch11.pdf

O'Neill, E. T., & Mai Chan, L. (2003). *FAST (faceted application of subject terminology): a simplified LCSH-based vocabulary*. Paper presented at the World Library and Information Congress: 69th IFLA General Conference and Council, Berlin (1-9 August 2003).

[Object-ID]. (1999). *Object-ID: international standard for describing art, antiques and antiquities*, 2002, from http://www.object-id.com

Olson, H. A. (1998). Mapping beyond Dewey's boundaries: constructing classificatory space for marginalized knowledge domains. *Library Trends, 47*(2), 233-254.

Paepcke, A., Chen-Chuan, K., Winograd, T., & Garcia-Molina, H. (1998). Interoperability for digital libraries worldwide. *Communications of the ACM, 41*(4), 33-42.

Partos, L. (2003). Documenting Ernabella. *Museum Victoria Magazine*(Autumn 2003), 16-19.

Peers, L., & Brown, A. K. (2003). *Museums and source communities: a Routledge reader*. London: Routledge.

[PictureAustralia].*PictureAustralia*, 2002, from http://www.pictureaustralia.org/

Pratt, M. L. (1992). *Imperial eyes: travel writing and transculturation*. London, New York: Routledge.

Pritchard, J. C. (2003). *Balancing registers thematically and the resultant conflicts between levels of significance: some insights derived from a gaps analysis of the heritage of the Tasman Peninsula, Tasmania*, 2003, from http://godot.unisa.edu.au/wac/pdfs/160.pdf

[QHTN]. (2002). *Quinkan Regional Centre - Laura*, 2003, from http://www.heritagetrails.qld.gov.au/attractions/laura.html

[RDF]. (2003). *Resource Description Framework (RDF)*, 2003, from http://www.w3.org/RDF/

[RENARDUS].*Renardus Service*, 2004, from http://www.renardus.org

[RNE].*Register of the National Estate*, 2003, from http://www.ahc.gov.au/heritage/register/index.html

Rose, D. B. (1996). *Nourishing terrains: Australian Aboriginal views of landscape and wilderness*. Canberra: Australian Heritage Commission.

Rose, D. B., & Clarke, A. (Eds.). (1997). *Tracking knowledge in North Australian landscapes: studies in Indigenous and settler ecological knowledge systems*. Canberra & Darwin: North Australia Research Unit, School of Pacific and Asian Studies, The Australian National University.

Ross, A., & Quandamooka-Land-Council. (1996). Aboriginal approaches to cultural heritage management: a Quandamooka case study. *Tempus, 6*, 107-112.

Ruig, J. L., & Morwood, M. J. (1995). History of S. E. Cape York. *Tempus, 3*, 41-53.

Satzinger, J. W., Jackson, R. B., & Burd, S. D. (2000). *Systems analysis and design in a changing world*. Cambridge, MA: Thomson Learning.

Saunders, W. (2002). *Archives, Aborigenes and the future: protecting and accessing Australia's historic records.* Paper presented at the Strehlow Conference - The Strehlows in the Context of British & German Ethnologies (18-20 September), Alice Springs.

Sculthorpe, G. (1985). Aborigenes and museums: the issues from an Aboriginal perspective. In *Papers presented at the ANZAAS Festival of Science (August 1985)* (pp. 21-31). Clayton, Vic.: Aboriginal Research Centre, Monash University.

Sculthorpe, G. (2001). Exhibiting Indigenous histories in Australian museums. In D. McIntyre & K. Wehner (Eds.), *National museums: negotiating histories* (pp. 73-85). Canberra: National Museum of Australia.

Sharp, N. (2002). *Saltwater people: the waves of memory*. Crows Nest: Allen and Unwin.

Shreeves, S. (2002). *Normalising of the Type Element*, 2003, from http://oai.grainger.uiuc.edu/papers/typenormalization.htm

Slavic, A. (2000). *A definition of thesauri and classification as indexing tools*, 2002, from http://dublincore.org/documents/2000/11/28/thesauri-definition/

Smith, C., & Ward, G. K. (Eds.). (2000). *Indigenous cultures in an interconnected world*. St Leonards, N.S.W.: Allen and Unwin.

Smith, K. (2002). *From oral tradition to digital collectives: information access and technology in contemporary native american culture*, Feb 2003, from http://www.rlg.org/preserv/diginews/v6_n6_feature1.html

Smith, L. T. (2001). *Decolonizing methodologies: research and Indigenous peoples*. Dunedin, N. Z.: University of Otago Press.

[SoE]. (2001). *Australia State of the Environment Report 2001 - Natural and Cultural Heritage Theme Report*, 2003, from http://www.deh.gov.au/soe/2001/heritage/pubs/heritage.pdf

St Pierre, M., & LaPlant, W. P., Jr. (1998). *Issues in crosswalking content Metadata standards*, 2002, from http://www.niso.org/press/whitepapers/crsswalk.html

Stanton, J. (2003). Snapshot on the Dreaming: photographs of the past and present. In L. Peers & A. K. Brown (Eds.), *Museums and source communities: a Routledge reader* (pp. 136-151). London: Routlege.

Star, S. L. (1998). Grounded classification: grounded theory and faceted classification. *Library Trends, 42*(2), 218-232.

Strang, V. (1997). *Uncommon ground: cultural landscapes and environmental values*. Oxford, New York: Berg.

[TEL].*The European Library (TEL): the gate to Europe's knowledge*, 2004, from http://www.europeanlibrary.org/

[TEL]. (2002). *TEL application profile for objects (version 1.0)*. Retrieved 2003, 2002, from http://www.europeanlibrary.org/tel_application_profile_v.htm

Tennant, R. (2000). *Interoperability: the digital library holy grail*, from http://escholarship.cdlib.org/rtennant/presentations/2000ala/exlibris/

[TGM-II]. (1995). *Thesaurus for Graphic Materials II: genre and physical characteristic terms (TGM II)*, 2004, from http://lcweb.loc.gov/rr/print/tgm2/

[TGM-I]. (1995). *Thesaurus for Graphic Materials I: subject terms (TGM I)*, 2004, from http://www.loc.gov/rr/print/tgm1/

[TGN]. (2000). *Getty Thesaurus of Geographic Names.*, 2004, from http://www.getty.edu/research/tools/vocabulary/tgn/index.html

Thomas, C. F., & Griffin, L. S. (1998). *Who will create Metadata for the Internet?*, 2002, from http://www.firstmonday.dk/issues/issue3_12/thomas/

Thornes, R., & Bold, J. (1998). *Documenting the cultural heritage.*, 2002, from http://www.object-id.com/heritage/index.html

Trezise, P. J. (1993). *Dream road: a journey of discovery* (2nd ed.). St Leonards, N.S.W.: Allen and Unwin.

Trigger, B. (1984). Alternative archaeologies: nationalist, colonialist, imperialist. *Man*(19), 355-370.

Trigger, B. (1989). *A history of archaeological thought*. Cambridge: Cambridge University Press.

[ULAN]. (2000). *Getty Union List of Artist Names*, 2004, from http://www.getty.edu/research/conducting_research/vocabularies/ulan/

UNESCO. (2001). *Report from the conference "Indigenous Identities: oral, written expressions and new technologies" (15-18 May)*, 2002, from http://www.unesco.org/culture/indigenous/html_eng/report.doc

van Veen, T. (2003). *Report on functionality of TEL metadata*, 2003, from http://www.europeanlibrary.org/pdf/tel_d3.2v1.0.pdf

[vCard].*vCard overview*, 2003, from http://www.imc.org/pdi/vcardoverview.html

von Liebenstein, G. (2000). *Interfacing global and Indigenous knowledge: towards an Indigenous knowledge information system.* Paper presented at the Information

Technologies in Educational Innovation for Development: Interfacing Global and Indigenous Knowledge (Sixth UNESCO-ACEID International Conference on Education, 12 – 15 December 2000), Bangkok, Thailand.

[VRA]. (2002). *VRA Core Categories, Version 3.0*, 2003, from http://www.vraweb.org/vracore3.htm

W3CDTF. (1997). *Date and Time Formats, W3C Note.*, 2004, from http://www.w3.org/TR/NOTE-datetime

Wagner, H., & Heery, R. (2002). *A Metadata registry for the Semantic Web*, 2003, from http://www.dlib.org/dlib/may02/wagner/05wagner.html

Waibel, G. (2002). *Description guidelines (version 1.2.0)*, 2003, from http://www.rlg.org/culturalres/descguide.html

Walsh, M. (1993). Classifying the world in an Aboriginal language. In M. Walsh & C. Yallop (Eds.), *Language and culture in Aboriginal Australia*. Canberra: Aboriginal Studies Press.

Wilson, A., & Clayphan, R. (2004). *Functional requirements for describing agents (Working Draft 2)*, 2004, from http://dublincore.org/groups/agents/agentFRdraft2-2.html

Woodley, M. (2000). *Crosswalks: the path to universal access*, 2002, from http://www.getty.edu/research/institute/standards/intrometadata/2_articles/woodley/index.html

Woodley, M., Clement, G., & Winn, P. (2003). *Dublin Core Glossary*, 2003, from http://dublincore.org/documents/usageguide/glossary.shtml

Worcman, K. (2002). *Digital division is cultural exclusion. But is digital inclusion cultural inclusion?*, 2003, from http://www.dlib.org/dlib/march02/worcman/03worcman.html

[WSDSG]. (2003). *Western States Dublin Core Metadata best practices (v. 1.2)*, 2003, from http://www.cdpheritage.org/resource/metadata/documents/WSDCMBP_v1-2_2003-01-20.pdf

[Yanyuwa].*Yanyuwa: land and life*, 2002 [Offline 28 April 2004], from http://www.deakin.edu.au/arts/diwurruwurru/yanyuwa/default.htm

[Yarrabah]. (2003). *Yarrabah Virtual Trails Project - News*, 2003, from http://www.gordonvale.org.au/deliver/content.asp?pid=959

APPENDIXES

Appendix 1. Papers accepted in refereed conferences.

Nevile, L. & Lissonnet, S. (2003). *Dublin Core: The base for an Indigenous culture environment?* Museums and the Web 2003. Retrieved, 2003, from the World Wide Web: http://www.archimuse.com/mw2003/papers/nevile/nevile.html

Nevile, L. & Lissonnet, S. (2003). Quinkan Matchbox Project: challenges in developing a metadata application profile (MAP) for an indigenous culture. AusWeb 2003. The Ninth Australian World Wide Web Conference. Retrieved, 2003, from the World Wide Web: http://ausweb.scu.edu.au/aw03/papers/lissonnet2/paper.html

Nevile, L., Lissonnet, S., Roberts, V. & Treviranus, J. (2004). Rich experiences for all participants. Museums and the Web 2004. Retrieved, 2004, from the World Wide Web: http://www.archimuse.com/mw2004/papers/nevile/nevile.html

Appendix 2. **The role of the MAP in resource discovery and content rendering.**

Appendix 3. Proposed Quinkan MAP v 6.0

Quinkan Matchbox Application Profile v. 6. 0.

The Dublin Core Metadata Element Set

Term Name: **Title**

URI: http://purl.org/dc/elements/1.1/title

Comment: A name given to the resource.

Description: Typically, a Title will be a name by which the resource is formally known.

Term Name: **Creator**

URI: http://purl.org/dc/elements/1.1/creator

Comment: An entity primarily responsible for making the content of the resource.

Description: Examples of a Creator include a person, an organisation, or a service. Typically, the name of a Creator should be used to indicate the entity.

Term Name: **Subject and Keywords**

URI: http://purl.org/dc/elements/1.1/subject

Comment: The topic of the content of the resource.

Description: Typically, a Subject will be expressed as keywords, key phrases or classification codes that describe a topic of the resource. Recommended best practice is to select a value from a controlled vocabulary or formal classification scheme.

Scheme: *Library of Congress Subject Headings*

Scheme: *Medical Subject Headings*

Scheme: *Dewey Decimal Classification*

Scheme: *Library of Congress Classification*

Scheme: *Universal Decimal Classification*

Scheme: *Thesaurus of Australian Government Subjects*

Scheme: *Australian Picture Thesaurus*

Scheme: *Aboriginal and Torres Strait Islander Thesaurus*

Scheme: *North Queensland Descriptors*

Scheme: *The Art and Architecture Thesaurus*

Term Name: **Description**

URI: http://purl.org/dc/elements/1.1/description

Comment: An account of the content of the resource.

Description: Description may include but is not limited to: an abstract, table of contents, reference to a graphical representation of content or a free-text account of the content.

Term Name: **Publisher**

URI: http://purl.org/dc/elements/1.1/publisher

Comment: An entity responsible for making the resource available

Description: Examples of a Publisher include a person, an organisation, or a service. Typically, the name of a Publisher should be used to indicate the entity.

Term Name: **Contributor**

URI: http://purl.org/dc/elements/1.1/contributor

Comment: An entity responsible for making contributions to the content of the resource.

Description: Examples of a Contributor include a person, an organisation, or a service. Typically, the name of a Contributor should be used to indicate the entity.

Term Name: **Date**

URI: http://purl.org/dc/elements/1.1/date

Comment: A date associated with an event in the life cycle of the resource.

Description: Typically, Date will be associated with the creation or availability of the resource. Recommended best practice for encoding the date value is defined in a profile of ISO 8601 [W3CDTF] and follows the YYYY-MM-DD format.

Scheme: *DCMI Period*

Scheme: *W3C-DTF*

Term Name: **Resource Type**

URI: http://purl.org/dc/elements/1.1/type

Comment: The nature or genre of the content of the resource.

Description: Type includes terms describing general categories, functions, genres, or aggregation levels for content. Recommended best practice is to select a value from a controlled vocabulary (for example, the DCMI Type Vocabulary [DCMITYPE]). To describe the physical or digital manifestation of the resource, use the Format element.

Scheme: *DCMI Type Vocabulary*

Collection, Dataset, Event, Image, Interactive Resource, Service, Software, Sound, Text, Physical Object, Still Image, Moving Image

Scheme: *VRA Record Type*

Scheme: Image, Work

Scheme: *QM Document Type Vocabulary*

Biblio/webliography, Cartoon/comic strip, Catalogue, Ceremony, Conference, Consultation, Correspondence, Diary, Diorama, Discography, Encyclopaedia, Essay, Fauna, Festival, Fiction, Field Notes, Flora, Game, Interview, Kit, Letter, Manuscript, Map, Model, Moving Image, Newspaper, Numeric Data, Oral Histories, Painting /Rock Art, Performance, Remote Sensing Image, Song/Music, Speech, Statistics, Still Image, Technical drawing/Arch. Chart, Thesis, Tool, Toy, Website, Workshop

Scheme: *Collection Level Description Vocabulary*

Collection - Dataset, Collection - Image, Collection - Moving Image, Collection - Interactive Resource, Collection - Physical Object, Collection - Software, Collection - Sound , Collection - Text

Scheme: *CIMI Type Vocabulary*

Scheme: Party, Place

Term Name: **Format**

URI: http://purl.org/dc/elements/1.1/format

Comment: The physical or digital manifestation of the resource.

Description: Typically, Format may include the media-type or dimensions of the resource. Format may be used to determine the software, hardware or other equipment needed to display or operate the resource. Examples of dimensions include size and duration. Recommended best practice is to select a value from a controlled vocabulary (for example, the list of Internet Media Types [MIME] defining computer media formats).

Scheme: *IMT*

Term Name: **Resource Identifier**

URI: http://purl.org/dc/elements/1.1/identifier

Comment: An unambiguous reference to the resource within a given context.

Description: Recommended best practice is to identify the resource by means of a string or number conforming to a formal identification system. Example formal identification systems include the Uniform Resource Identifier (**URI**) (including the Uniform Resource Locator (URL)), the Digital Object Identifier (DOI) and the International Standard Book Number (ISBN).

Scheme: *A **URI** Uniform Resource Identifier*

Scheme: *An International Standard Book Number*

Scheme: *An International Standard Serial Number*

Scheme: *Record ID*

Scheme: *Local Accession Number*

Scheme: *Matchbox number*

Term Name: **Source**

URI: http://purl.org/dc/elements/1.1/source

Comment: A reference to a resource from which the present resource is derived.

Description: The present resource may be derived from the Source resource in whole or in part. Recommended best practice is to reference the resource by means of a string or number conforming to a formal identification system.

Scheme: *A **URI** Uniform Resource Identifier*

Term Name: **Language**

URI: http://purl.org/dc/elements/1.1/language

Comment: A language of the intellectual content of the resource.

Description: Recommended best practice is to use RFC 3066 [RFC3066], which, in conjunction with ISO 639 [ISO639], defines two- and three-letter primary language tags with optional subtags. Examples include "en" or "eng" for English, "akk" for Akkadian, and "en-GB" for English used in the United Kingdom.

Scheme: *ISO 639-2*

Scheme: *RFC 1766*

Scheme: *RFC 3066*

Scheme: *QM Indigenous Language Group*

Gugu-Thypan, Gugu-Yalanji, Gugu-Yimithirr, Gugu-Warra, Gugu-Bullanji , Gugu-Minni, Olcula, Other

Term Name: **Relation**

URI: http://purl.org/dc/elements/1.1/relation

Comment: A reference to a related resource.

Description: Recommended best practice is to reference the resource by means of a string or number conforming to a formal identification system.

Scheme: *A **URI** Uniform Resource Identifier*

Term Name: **Coverage**

URI: http://purl.org/dc/elements/1.1/coverage

Comment: The extent or scope of the content of the resource.

Description: Coverage will typically include spatial location (a place name or geographic coordinates), temporal period (a period label, date, or date range) or jurisdiction (such as a named administrative entity). Recommended best practice is to select a value from a controlled vocabulary (for example, the Thesaurus of Geographic Names [TGN]) and that, where appropriate, named places or time periods be used in preference to numeric identifiers such as sets of coordinates or date ranges.

Term Name: **Rights Management**

URI: http://purl.org/dc/elements/1.1/rights

Comment: Information about rights held in and over the resource.

Description: Typically, a Rights element will contain a rights management statement for the resource, or reference a service providing such information. Rights information often encompasses Intellectual Property Rights (IPR), Copyright, and various Property Rights. If the Rights element is absent, no assumptions can be made about the status of these and other rights with respect to the resource.

Dublin Core Element Set Qualifier Vocabulary

Term Name: Audience

URI: http://purl.org/dc/terms/audience

Comment: A class of entity for whom the resource is intended or useful.

Description: A class of entity may be determined by the creator or the publisher or by a third party.

Term Name: Alternative
URI: http://purl.org/dc/terms/alternative
Comment: Any form of the title used as a substitute or alternative to the formal title of the resource.
Description: This qualifier can include Title abbreviations as well as translations.
Refines: http://purl.org/dc/elements/1.1/title

Term Name: Table Of Contents
URI: http://purl.org/dc/terms/tableOfContents
Comment: A list of subunits of the content of the resource.
Refines: http://purl.org/dc/elements/1.1/description

Term Name: Abstract/Site Summary
URI: http://purl.org/dc/terms/abstract
Comment: A summary of the content of the resource.
Refines: http://purl.org/dc/elements/1.1/description

Term Name: Created
URI: http://purl.org/dc/terms/created
Comment: Date of creation of the resource.
Refines: http://purl.org/dc/elements/1.1/date

Term Name: Valid
URI: http://purl.org/dc/terms/valid
Comment: Date (often a range) of validity of a resource.
Refines: http://purl.org/dc/elements/1.1/date

Term Name: Available
URI: http://purl.org/dc/terms/available
Comment: Date (often a range) that the resource will become or did become available.
Refines: http://purl.org/dc/elements/1.1/date

Term Name: Issued
URI: http://purl.org/dc/terms/issued
Comment: Date of formal issuance (e.g., publication) of the resource.
Refines: http://purl.org/dc/elements/1.1/date

Term Name: Modified
URI: http://purl.org/dc/terms/modified
Comment: Date on which the resource was changed.
Refines: http://purl.org/dc/elements/1.1/date

Term Name: Extent
URI: http://purl.org/dc/terms/extent
Comment: The size or duration of the resource.
Refines: http://purl.org/dc/elements/1.1/format

Term Name: Medium
URI: http://purl.org/dc/terms/medium
Comment: The material or physical carrier of the resource.
Refines: http://purl.org/dc/elements/1.1/format
Scheme: QM Physical Format Vocabulary
CD ROM, Compact Disc, Digital Audio Tape (DAT), DVD, Film Reel, Laser Disks, Microform, Print (Copy), Print (Original), Slide, Record (LP Record), Videocassette S-VHS, Tape (Meaning Reel-to-Reel), Cassette Tape, Transparency, Videocassette U-Max, Videocassette VHS, Other

Term Name: Is Version Of
URI: http://purl.org/dc/terms/isVersionOf
Comment: The described resource is a version, edition, or adaptation of the referenced resource. Changes in version imply substantive changes in content rather than differences in format.
Refines: http://purl.org/dc/elements/1.1/relation

Term Name: Has Version
URI: http://purl.org/dc/terms/hasVersion

Comment: The described resource has a version, edition, or adaptation, namely, the referenced resource.
Refines: http://purl.org/dc/elements/1.1/relation

Term Name: Is Replaced By
URI: http://purl.org/dc/terms/isReplacedBy
Comment: The described resource is supplanted, displaced, or superseded by the referenced resource.
Refines: http://purl.org/dc/elements/1.1/relation

Term Name: Replaces
URI: http://purl.org/dc/terms/replaces
Comment: The described resource supplants, displaces, or supersedes the referenced resource.
Refines: http://purl.org/dc/elements/1.1/relation

Term Name: Is Required By
URI: http://purl.org/dc/terms/isRequiredBy
Comment: The described resource is required by the referenced resource, either physically or logically.
Refines: http://purl.org/dc/elements/1.1/relation

Term Name: Requires
URI: http://purl.org/dc/terms/requires
Comment: The described resource requires the referenced resource to support its function, delivery, or coherence of content.
Refines: http://purl.org/dc/elements/1.1/relation

Term Name: Is Part Of
URI: http://purl.org/dc/terms/isPartOf
Comment: The described resource is a physical or logical part of the referenced resource.
Refines: http://purl.org/dc/elements/1.1/relation

Term Name: Has Part

URI: http://purl.org/dc/terms/hasPart

Comment: The described resource includes the referenced resource either physically or logically.

Refines: http://purl.org/dc/elements/1.1/relation

Term Name: Is Referenced By

URI: http://purl.org/dc/terms/isReferencedBy

Comment: The described resource is referenced, cited, or otherwise pointed to by the referenced resource.

Refines: http://purl.org/dc/elements/1.1/relation

Term Name: References

URI: http://purl.org/dc/terms/references

Comment: The described resource references, cites, or otherwise points to the referenced resource.

Refines: http://purl.org/dc/elements/1.1/relation

Term Name: Is Format Of

URI: http://purl.org/dc/terms/isFormatOf

Comment: The described resource is the same intellectual content of the referenced resource, but presented in another format.

Refines: http://purl.org/dc/elements/1.1/relation

Term Name: Has Format

URI: http://purl.org/dc/terms/hasFormat

Comment: The described resource pre-existed the referenced resource, which is essentially the same intellectual content presented in another format.

Refines: http://purl.org/dc/elements/1.1/relation

Term Name: Conforms To

URI: http://purl.org/dc/terms/conformsTo

Comment: A reference to an established standard to which the resource conforms.

Refines: http://purl.org/dc/elements/1.1/relation

Term Name: Spatial

URI: http://purl.org/dc/terms/spatial

Comment: Spatial characteristics of the intellectual content of the resource.

Refines: http://purl.org/dc/elements/1.1/coverage

Scheme: DCMI Point

Scheme: ISO 3166

Scheme: DCMI Box

Scheme: TGN

Scheme: The Australian Gazetteer

Scheme: QM Local Region Vocabulary

Battle Camp Sandstones, Coastal Lowlands, Cohen -Yamba Inliers, Hodgkinson Hills, Holroyd Plain, Karumba Plains, Merluna Plain, Mitchell-Gilbert Fans, Wet Tropics, Other

Scheme: QM Townships Vocabulary

Bonney Glen, Butchers Hill (Yunk-kur), Cooktown, Glengarland, Jowalbinna, Kalinga, Koolburra, Lakefield, Laura, Marina Plains, Maytown (Wulburjurbur), Musgrave, Old Laura Homestead, Palmerville, Port Stewart, Other

Scheme: QM Location Vocabulary

Location, Collection, Call Number

Term Name: Temporal

URI: http://purl.org/dc/terms/temporal

Comment: Temporal characteristics of the intellectual content of the resource.

Refines: http://purl.org/dc/elements/1.1/coverage

Scheme: LCSH

Scheme: DCMI Period

Scheme: W3C-DTF

Scheme: The Art and Architecture Thesaurus

Scheme: QM Season Vocabulary

Kamba - Proper Wet Time (Dec-May), Kabakabada - Under Water Time (April-May), Buluriji - Cold Time (June-Sept), Wungariji - Hot Time (Oct-Nov), Jarramali - Storm Time (Nov-mid-Dec)

Scheme: QM Rock Art Sequence Vocabulary

Late Pleistocene (34000 to 18000 BP), Terminal Pleistocene (18000 to 10000 BP), Early Holocene (10000 to 4000 BP), Late Holocene (4000 BP) to European Contact (80 BP), European Contact Period (1873 CE to 1920s)

Scheme: QM Themes Vocabulary

Laura Dance Festival Time, Trepang Era, Pearling Era, Establishing the Pastoral Industry Era, Gold Rush Era, Mining Era, Other

Scheme: QM Queensland Broad Eras Vocabulary

Protection Era (1898 - 1957), Assimilation Era (1957 - 1972), Self Determination Era, Self-Management and Self-Empowerment Era

Term Name: Mediator

URI: http://purl.org/dc/terms/mediator

Comment: A class of entity that mediates access to the resource and for whom the resource is intended or useful.

Description: The audiences for a resource are of two basic classes: (1) an ultimate beneficiary of the resource, and (2) frequently, an entity that mediates access to the resource. The mediator element refinement represents the second of these two classes.

Refines: http://purl.org/dc/terms/audience

Term Name: Date Accepted

URI: http://purl.org/dc/terms/dateAccepted

Comment: Date of acceptance of the resource (e.g. of thesis by university department, of article by journal, etc.).

Refines: http://purl.org/dc/elements/1.1/date

Term Name: Date Copyrighted

URI: http://purl.org/dc/terms/dateCopyrighted

Comment: Date of a statement of copyright.

Refines: http://purl.org/dc/elements/1.1/date

Term Name: Date Submitted

URI: http://purl.org/dc/terms/dateSubmitted

Comment: Date of submission of the resource (e.g. thesis, articles, etc.).

Refines: http://purl.org/dc/elements/1.1/date

Term Name: Audience Education Level

URI: http://purl.org/dc/terms/educationLevel

Comment: A general statement describing the education or training context. Alternatively, a more specific statement of the location of the audience in terms of its progression through an education or training context.
Refines: http://purl.org/dc/terms/audience

Term Name: Access Rights
URI: http://purl.org/dc/terms/accessRights
Comment: Information about who can access the resource or an indication of its security status.
Description: Access Rights may include information regarding access or restrictions based on privacy, security or other regulations.
Refines: http://purl.org/dc/elements/1.1/rights

Term Name: Bibliographic Citation
URI: http://purl.org/dc/terms/bibliographicCitation
Comment: A bibliographic reference for the resource.
Description: Recommended practice is to include sufficient bibliographic detail to identify the resource as unambiguously as possible, whether or not the citation is in a standard form.
Refines: http://purl.org/dc/elements/1.1/identifier

Quinkan Matchbox Element Set Qualifier Vocabulary

Term Name: Site
URI: http://www.quinkanmatchbox.com/terms/site
Refines: http://purl.org/dc/elements/1.1/subject

Term Name: Art Census
URI: http://www.quinkanmatchbox.com/terms/artCensus
Refines: http://purl.org/dc/elements/1.1/subject

Term Name: Colour
URI: http://www.quinkanmatchbox.com/terms/colour
Refines: http://purl.org/dc/elements/1.1/subject

Term Name: Originator

URI: http://www.quinkanmatchbox.com/terms/originator

Comment: Typically, a personal name

Refines: http://www.quinkanmatchbox.com/terms/site

Term Name: Site Type

URI: http://www.quinkanmatchbox.com/terms/siteType

Refines: http://www.quinkanmatchbox.com/terms/site

Scheme: Site Type Vocabulary

Cave, Open, Overhang, Rock Shelter

Term Name: Site Attribute

URI: http://www.quinkanmatchbox.com/terms/siteAttribute

Comment: Multiple choices are allowed

Refines: http://www.quinkanmatchbox.com/terms/site

Scheme: Site Attribute Vocabulary

Artefact Scatter, Axe Grinding Groove, Burial, Carved Tree, Dwelling, Earthen Circle, Engraving, Fish Trap, Hearth/Oven, Painting, Pathway, Quarry, Scarred Tree, Shell Midden, Stone Arrangement, Stone Circle, Story Place, Weir, Well, Other

Term Name: Site Material

URI: http://www.quinkanmatchbox.com/terms/siteMaterial

Comment: Multiple choices are allowed

Refines: http://www.quinkanmatchbox.com/terms/site

Scheme: Site Material Vocabulary

Bone, Burial, Charcoal, Engraving, European Material, Painting, Shell, Stone, Vegetable, Wood, Other

Term Name: Site Structure

URI: http://www.quinkanmatchbox.com/terms/siteStructure

Refines: http://www.quinkanmatchbox.com/terms/site

Scheme: Site Structure Vocabulary

Buried Single Component, Multi-Component/Stratified, Surface Scatter, Other

Term Name: Art Technique

URI: http://www.quinkanmatchbox.com/terms/artTechnique

Refines: http://www.quinkanmatchbox.com/terms/artCensus

Scheme: Art Technique Vocabulary

Drawing, Engraving, Painted Engraving, Painting, Print, Stencil, Other

Term Name: Motif/Stories (Non-Figurative)

URI: http://www.quinkanmatchbox.com/terms/motif-nf

Comment: For each motif, choose a colour scheme and a technique

Refines: http://www.quinkanmatchbox.com/terms/artCensus

Scheme: Non-Figurative Motif Vocabulary

Bird Track, Circle/oval, Dots, Line, Radiating form (star, sun), Other

Term Name: Motif/Stories (Figurative)

URI: http://www.quinkanmatchbox.com/terms/motif-f

Refines: http://www.quinkanmatchbox.com/terms/artCensus

Scheme: Figurative Motif Vocabulary

Animal Story Figure (Therianthrope), Bird, Boomerang, Crocodile, Cultural objects (not easily identifiable), Dilly bag, Dingo, Echidna, Eel/catfish, Eggs, Emu, Fish, Flying Fox, Foot, Goanna, Hand, Horse, Human or Human Story Figure (Anthropomorph), Macropod (Kangaroo or Wallaby Species), Macropod Track, Native Cat, Pig, Plant (Vegetable), Possum, Quinkan (Spirit Figure), Scrub Turkey, Snake, Spear, Spear Thrower, Steel Axe, Stone Axe, Tortoise, Yam, Other

Term Name: Monochrome (Solid)

URI: http://www.quinkanmatchbox.com/terms/monochrome-solid

Refines: http://www.quinkanmatchbox.com/terms/colour

Scheme: Monochrome Solid Vocabulary

Red, White, Yellow

Term Name: Monochrome (Outline)

URI: http://www.quinkanmatchbox.com/terms/monochrome-outline

Refines: http://www.quinkanmatchbox.com/terms/colour

Scheme: Monochrome Outline Vocabulary

White, Yellow

Term Name: Bichrome

URI: http://www.quinkanmatchbox.com/terms/bichrome

Refines: http://www.quinkanmatchbox.com/terms/colour

Scheme: Bichrome Vocabulary

Red and Red, Red and White, Red and Yellow, Yellow and White

Term Name: Polychrome

URI: http://www.quinkanmatchbox.com/terms/polychrome

Refines: http://www.quinkanmatchbox.com/terms/colour

Term Name: Exceptions

URI: http://www.quinkanmatchbox.com/terms/exceptions

Refines: http://www.quinkanmatchbox.com/terms/colour

Term Name: Data Gathered

URI: http://www.quinkanmatchbox.com/terms/DataGathered

Refines: http://purl.org/dc/elements/1.1/date

Term Name: Role

URI: http://www.quinkanmatchbox.com/terms/role

Refines: http://purl.org/dc/elements/1.1/creator

Scheme: MARC Relator Vocabulary

Actor, Artist, Author, Collector, Cartographer, Compiler, Consultant, Dancer, Director, Depositor, Editor, Illustrator, Interviewer, Interviewee, Musician, Narrator, Performer, Photographer, Originator, Producer, Researcher, Research team head, Research team member, Speaker, Sponsor, Translator

Scheme: QM Role Vocabulary

Aboriginal Person, Benefactor, Consultant, EPA/Parks, Government, Journalist, Local Resident, Nominator, Ranger, Researcher, Tourism Professional, Tourist, Unknown, Warden, Other

Term Name: Site of Significance

URI: http://www.quinkanmatchbox.com/terms/siteOfSignificance

Refines: http://purl.org/dc/elements/1.1/description

Term Name: History

URI: http://www.quinkanmatchbox.com/terms/history

Refines: http://purl.org/dc/elements/1.1/description

Term Name: General Direction

URI: http://www.quinkanmatchbox.com/terms/generalDirection

Refines: http://purl.org/dc/elements/1.1/description

Term Name: Contextual Notes

URI: http://www.quinkanmatchbox.com/terms/contextualNotes

Refines: http://purl.org/dc/elements/1.1/description

Term Name: Class

URI: http://www.quinkanmatchbox.com/terms/class

Refines: http://purl.org/dc/elements/1.1/description

Scheme: ANZMETA Class Vocabulary

Indigenous, Historic, Natural

Term Name: Legal Status

URI: http://www.quinkanmatchbox.com/terms/legalStatus

Refines: http://purl.org/dc/elements/1.1/description

Scheme: ANZMETA Legal Status

Indicative Place, Interim List, Registered, Removed from Register or IL, Destroyed, Rejected Place, Identified Place, Duplicate Record, Identified Through State Processes

Term Name: Progress

URI: http://www.quinkanmatchbox.com/terms/progress

Refines: http://purl.org/dc/elements/1.1/description

Scheme: ANZMETA Progress Vocabulary

Complete, In Progress, Planned, Not Known

Term Name: Maintenance

URI: http://www.quinkanmatchbox.com/terms/maintenance

Refines: http://purl.org/dc/elements/1.1/description

Scheme: ANZMETA Maintenance Vocabulary

Continual, Daily, Weekly, Monthly, Quarterly, Bi-annually, Annually, As Required, Irregular, Not Planned, Not Known

Term Name: Data Quality

URI: http://www.quinkanmatchbox.com/terms/dataQuality

Refines: http://purl.org/dc/elements/1.1/description

Term Name: Has Thumbnail

URI: http://www.quinkanmatchbox.com/terms/hasThumbnail

Refines: http://purl.org/dc/elements/1.1/relation

Scheme: A **URI** Uniform Resource Identifier

Term Name: Record Visibility

URI: http://www.quinkanmatchbox.com/terms/recordVisibility

Refines: http://purl.org/dc/elements/1.1/rights

Scheme: QM Metadata Visibility

Public (available for search, browse, display), Private (hidden)

Term Name: Rights Holders

URI: http://www.quinkanmatchbox.com/terms/rightsHolders

Refines: http://purl.org/dc/elements/1.1/rights

Scheme: AGLS Agent

Term Name: Handling Notes

URI: http://www.quinkanmatchbox.com/terms/handlingNotes

Refines: http://purl.org/dc/elements/1.1/rights

Term Name: ICPR Note and Rating

URI: http://www.quinkanmatchbox.com/terms/noteRating

Refines: http://purl.org/dc/elements/1.1/rights

Scheme: QM ICPR Note and Rating

Content Endorsed by QM, Content Disowned by QM, Notify Creator - unauthorised/unlicensed Content

Term Name: Native Format
URI: http://www.quinkanmatchbox.com/terms/nativeFormat
Refines: http://purl.org/dc/elements/1.1/format
Scheme: QM Native Format Scheme
Digital, Non-Digital

Term Name: Person
URI: http://www.quinkanmatchbox.com/terms/person
Refines: http://purl.org/dc/elements/1.1/subject

Term Name: Object Name
URI: http://www.quinkanmatchbox.com/terms/objectName
Refines: http://purl.org/dc/elements/1.1/subject
Scheme: QM Object Name Vocabulary
QM Object Name Vocabulary, Adornment, Advertising, Adze, Adze blade, Adze handle, Ancestral board, Ancestral figure, Anchor, Animal, Anvil, Arm protector, Armband, Armlet, Arrow, Attire, Awl, Axe, Axe/Adze, Axe/Adze blade, Axe/Adze handle, Axe blade, Axe handle, Bag, Bag, Bilum, Bailer, Ball, Ballast, Bandolier, Bark painting, Basket, Beater, Beeswax, Bell, Betel mortar, Betel nut, Betel pestle, Bitumen, Blood-letting spike, Boab Nut, Bobbon, Body armour, Bodydress, Bodyshirt, Bone object, Book, Boomerang, Bow, Bowl, Bracelet, Broom, Brush, Bullroarer , Burial container, Burial Post, Canoe, Canoe prow, Casting, Ceramic shards, Chart, Chisel, Chopper, Circumcision knife, Clap stick, Clapping boomerang, Clay, Cleaver, Club, Container, Core, Crayon drawing, Cup, Cut water, Dagger, Dancing implement, Diagram, Didgeridoo - Drone pipe, Digging dish, Digging stick, Dish, Doll, Dragnet, Drawing, Drill, Drum, Ear pendant, Earplug, Earring, Echidna spines, Emu Egg, Engraver, Ethnographica, Fabricator, Facemask, Fan, Feather money, Feather shoes, Fibre skirt/apron, Fibre string, Field Equipment, Fighting Stick, Figure head, Figurine, Figurine fragment, Film, Fire stick, Fire sticks, Fishhook, Flute, Food container, Footshoe, Friction idiophone, Furniture, Game, Gouge, Griller, Grind stone, Grinder, Hairband, Hairbelt, Haircomb, Hairfeather, Hairpin, Hairstring, Hammer, Hammer stone, Hanging hook, Harp, Harpoon, Hatchet, Head pad, Headband, Headcap, Headdress, Headhat, Headrest, Historica, Hook, House ornament, Installation, Kiln fragments,

Knife, Knifesheath, Laundry item, Legging, Lime container, Lime container stopper, Lime mortar, Lime pestle, Lime spatula, Line, Lithic material, Lure, Magic object, Magical utensil, Mallet, Map, Mask, Mat, Medical implement, Medicinal, Medicine bag, Message Stick, Microlith, Mill stone, Model, Mortar, Mourning ring, Mouth harp, Muller, Mummification, Neck pendant, Neckband, Necklace, Necklet, Net, Net float, Net sinker, No object assigned, Nose ornament, Nose-peg, Ochre, Opium pipe, Orator's tool, Ornament, Oyster pick, Paddle, Painted object, Painting, Pallette, Pan pipe, Pearlshell, Peeler, Pendant, Pestle, Photograph, Pick, Pipe, Pituri, Plaque, Plate, Platter, Plume(s), Pointing bone, Pointing stick, Pole, Polisher, Popping tube, Pot, Pot stand, Pottery, Pottery tool, Pounder, Prepared raw material, Pressure Flaker, Print, Pubic cover, Pubic tassle, Quiver, Raft, Raincape, Rainmaking implement, Rangga, Rasp, Rattle, Record, Reel, Replica, Resin, Rope, Sacred board, Sacred headpiece, Sacred item, Sacred Mareiin Object, Sacred stone, Sacred string figure, Sago peg, Sail, Salt block, Sandals, Scoopnet, Scraper, Scroll, Sculpture, Seal, Serrating tool, Shell, Shell band, Shell blade, Shell money, Shelter, Shield, Skeletal material, Skull, Sling, Sling stone, Smoking utensil, Sorcery object, Spade, Spear, Spear head, Spear point(s), Spear thrower, Spear tip, Spearhead, Spearthrower, Spindle, Spinning comb, Spinning loom, Spinning stick Distaff, Spinning top, Spoon, Steering Oar, Stelae, Stone, Stone tool, Stone tool(s), Stool, Strainer, Streamer, Switch, T-shirt, Tapa bark cloth, Tapa cloth, Tape, Tea pot, Textile, Throwing stick, Tobacco, Torch-Firestick, Toys, Trap, Tray, Trumpet, Vase, Vegetable, Videotape, Violin, Waistapron, Waistbelt, Waistskirt, Walking stick, Wallet, Whetstone, Whisk, Whistle, Wooden bowl, Wooden emblem

Term Name: Language Group

URI: http://www.quinkanmatchbox.com/terms/languageGroup

Refines: http://purl.org/dc/elements/1.1/subject

Scheme: QM Indigenous Language Group

Gugu-Thaypan, Gugu-Yalanji, Gugu-Yimithirr, Gugu-Warra, Gugu-Bullanji , Gugu-Minni, Olcula, Other

'Other' Metadata Elements

Term Name: Edition

URI: http://www.loc.gov/mods/edition

Comment: Information designating the version or edition of a work.

Description: Being able to specify the version or edition of a given work is often critical to successful resource discovery and identification to determine whether a resource is the same as

another one. This is particularly important for resources that change frequently. This is not to be used for versions in the sense of different physical formats (e.g. the PDF version of a textual resource).

Term Name: **Partner**

URI: http://www.loc.gov/mods/location

Comment: Identifies the organization holding the resource or from which access is obtained.

Description: Use for a physical location that allows the user to retrieve the item when a **URI** is not appropriate (e.g. for physical items not available electronically). This also facilitates access if the **URI** doesn't retrieve anything or only a poor substitute. For the Quinkan Matchbox, we recommend adopting a string "Organisation - Collection - Call Number"

Scheme: *QM Location Vocabulary*

Location, Collection, Call Number

Term Name: **Availability**

URI: http://www.agls.gov.au/rdf/1.2/availability

Comment: How the resource can be obtained or contact information for obtaining the resource

Scheme: *AGLS Availability Scheme*

'Other' Qualifier Elements

Term Name: **Date Captured**

URI: http://www.loc.gov/mods/dateCaptured

Comment: This includes the date that a snapshot of the resource was taken (particularly for dynamic resources) if different from Date.Created.

Description: Date that the resource was captured.

Refines: http://purl.org/dc/elements/1.1/date

Term Name: **Accumulation Date Range**

URI: http://example.org/cld/terms#accumulationDateRange

Comment: Enter a date range - two dates separated by a forward-slash (/). Each date should be entered according to the W3C note on 'Date and Time Formats',

http://www.w3.org/TR/NOTE-datetime. Null dates may be used to indicate open-ended date ranges.

Description: The range of dates over which the collection was accumulated.

Refines: http://purl.org/dc/elements/1.1/date

Term Name: **Contents Date Range**

URI: http://example.org/cld/terms#contentsDateRange

Comment: Enter a date range - two dates separated by a forward-slash (/). Each date should be entered according to the W3C note on 'Date and Time Formats', http://www.w3.org/TR/NOTE-datetime. Null dates may be used to indicate open-ended date ranges.

Description: The range of dates of the individual items within the collection.

Refines: http://purl.org/dc/elements/1.1/date

Term Name: **Is Available At**

URI: http://example.org/gen/terms#isAvailableAt

Description: The physical or online (digital) location of the collection.

Refines: http://purl.org/dc/elements/1.1/relation

Agls Agent Scheme

Term Name: Personal Name

URI: http://www.agls.gov.au/rdf/agents/#personalName

Comment: The name of a person

Refines: http://purl.org/dc/elements/1.1/creator

Refines: http://purl.org/dc/elements/1.1/contributor

Refines: http://purl.org/dc/elements/1.1/publisher

Refines: http://www.quinkanmatchbox.com/terms/rightsHolders

Term Name: Corporate Name

URI: http://www.agls.gov.au/rdf/agents/corporateName

Comment: The name of an organisation

Refines: http://purl.org/dc/elements/1.1/creator

Refines: http://purl.org/dc/elements/1.1/contributor

Refines: http://purl.org/dc/elements/1.1/publisher

Refines: http://www.quinkanmatchbox.com/terms/rightsHolders

Term Name: Jurisdiction

URI: http://www.agls.gov.au/rdf/agents/jurisdiction

Comment: The legal jurisdiction of the agent. NB values for this component must be drawn from the AGLS Jurisdiction controlled list

Refines: http://purl.org/dc/elements/1.1/creator

Refines: http://purl.org/dc/elements/1.1/contributor

Refines: http://purl.org/dc/elements/1.1/publisher

Refines: http://www.quinkanmatchbox.com/terms/rightsHolders

Refines: http://purl.org/dc/elements/1.1/coverage

Scheme:

Term Name: Contact

URI: http://www.agls.gov.au/rdf/agents/contact

Comment: Contact details for the agent. Can include an official title. Typically includes a phone number.

Refines: http://purl.org/dc/elements/1.1/creator

Refines: http://purl.org/dc/elements/1.1/contributor

Refines: http://purl.org/dc/elements/1.1/publisher

Refines: http://www.quinkanmatchbox.com/terms/rightsHolders

Term Name: Address

URI: http://www.agls.gov.au/rdf/agents/address

Comment: Street or postal address for the agent.

Refines: http://purl.org/dc/elements/1.1/creator

Refines: http://purl.org/dc/elements/1.1/contributor

Refines: http://purl.org/dc/elements/1.1/publisher

Refines: http://www.quinkanmatchbox.com/terms/rightsHolders

Term Name: email

URI: http://www.agls.gov.au/rdf/agents/email

Comment: An email address for the agent.

Refines: http://purl.org/dc/elements/1.1/creator

Refines: http://purl.org/dc/elements/1.1/contributor

Refines: http://purl.org/dc/elements/1.1/publisher

Refines: http://www.quinkanmatchbox.com/terms/rightsHolders

Term Name: sector

URI: http://www.agls.gov.au/rdf/agents/sector

Comment: Indicates whether the creator is from the government or non-government sector: 'government' and 'non-government' are the only allowable values NB The default value is 'government'

Refines: http://purl.org/dc/elements/1.1/creator

Refines: http://purl.org/dc/elements/1.1/contributor

Refines: http://purl.org/dc/elements/1.1/publisher

Refines: http://www.quinkanmatchbox.com/terms/rightsHolders

Agls Availbility Scheme

Term Name: Personal Name

URI: http://www.agls.gov.au/rdf/availability/personalName

Comment: The name of a person making the resource available or providing access to the resource.

Term Name: Corporate Name

URI: http://www.agls.gov.au/rdf/availability/corporateName

Comment: The name of an organisation making the resource available or providing access to the resource.

Term Name: Jurisdiction

URI: http://www.agls.gov.au/rdf/availability/jurisdiction

Comment: The legal jurisdiction of the organisation making the resource available or providing access. NB values for this component must be drawn from the AGLS Jurisdiction controlled list

Term Name: **Contact**

URI: http://www.agls.gov.au/rdf/availability/contact

Comment: Contact details for the person or organisation making ghe resource available or providing access. Can include an official title. Typically includes a phone number.

Term Name: **Address**

URI: http://www.agls.gov.au/rdf/availability/address

Comment: Street or postal address for the person or organisation making ghe resource available or providing access.

Term Name: **Email**

URI: http://www.agls.gov.au/rdf/availability/email

Comment: An email address for the person or organisation making ghe resource available or providing access.

Term Name: **Hours**

URI: http://www.agls.gov.au/rdf/availability/hours

Comment: The hours during which access to the resource or contact person can occur.

Term Name: **Cost**

URI: http://www.agls.gov.au/rdf/availability/cost

Comment: Indicates the cost of obtaining the resource or access to the resource.

Term Name: **Postcode**

URI: http://www.agls.gov.au/rdf/availability/postcode

Comment: The postcode(s) of the locations at which the resource can be accessed, or is made available.