MANAGING INDIGENOUS DIGITAL DATA: AN EXPLORATION OF THE OUR STORY DATABASE IN INDIGENOUS LIBRARIES AND KNOWLEDGE CENTRES OF THE NORTHERN TERRITORY

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INTRODUCTION

The following report explores the management of Indigenous data within the Northern Territory Library's *Our Story* databases, installed at 14 sites across the Northern Territory (see Appendix C). The information contained within this report will assist University of Technology Sydney (UTS) researchers with data management planning, will inform the development of protocols regarding digital repatriation to Indigenous communities, and will also assist in the development of the Aboriginal and Torres Strait Islander Data Archive (ATSIDA) website. In a broader sense the work will be incorporated into the initial stages of building an Indigenous node of the Australian Social Science Data Archive at the University of Technology Sydney.

Implementation of the *Our Story* database is an excellent example of the way in which an Australian library service can make serious attempts to improve Indigenous access to information via digital technology. The *Our Story* database forms a critical component of the Northern Territory Library's 'Libraries and Knowledge Centres' (LKC) program, which has concentrated on the development of digital information delivery in remote Indigenous communities for the past five years. Other relevant models of Indigenous Knowledge Management in the Australian context are also discussed within this report, but the main focus is upon the LKC program, which is arguably the most well-developed of its type within Australia.

This report is divided into three sections. Section one provides an overview of the LKC program and outlines a brief description of the *Our Story* database, including some of its strengths and weaknesses. Section two comprehensively explores the challenges associated with developing a digital collection in the remote Indigenous context. This incorporates a discussion of key aspects of the LKC model, including repatriation of material in digital form, establishment of protocols reflective of Indigenous cultural values, and the provision of support and training. The third section presents an overview of issues associated with the up-take and use of Information and Communications Technologies (ICTs) in Aboriginal communities and, in particular, peoples current attitudes to online digital archives. The final section of the report discusses the possible specifications of future Indigenous data archive systems and offers perspectives on some of the issues that may continue to challenge these programs in the long-term.

SECTION 1. BACKGROUND

1.1 THE LKC PROGRAM

The Northern Territory Library, in partnership with Local Government Shires, provides public library services to Territorians. In a number of remote communities, usually with high indigenous populations, library services are delivered through the NTL's Libraries and Knowledge Centres (LKC) Program. The broad objectives of the program are to:

- Provide access to knowledge and information through core library services;
- Support information literacy programs;
- Provide access to recreational activities for all groups within the community;
- Enable the acquisition and preservation of local knowledge and;
- Provide training and support to community members engaged in acquiring and preserving knowledge.
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Implementation of the LKC program began in 2004 and in the following year, a team of researchers led by Professor Martin Nakata of the Jumbunna House Learning at the University of Technology Sydney carried out an evaluation of the new program. Nakata reported that the LKC model, and in particular the implementation of the 'Our Story' database system, had stimulated a number of 'communities to search for and retrieve documented knowledge from external sources' and had required communities to engage with digital media technologies in meaningful ways (Nakata 2005:72). The research went on to propose that library programs like this, that found ways of managing Indigenous content and fostered community interest in accessing global information networks, could become key infrastructure elements in Indigenous communities into the future (Nakata et al 2006:72).

As suggested by the Nakata review, and subsequent research into the LKC model, the experience of the Northern Territory Library is particularly relevant to considerations of the most appropriate avenues for managing Indigenous digital content (Papandrea 2006, Kral 2008, Nakata 2008). The notion that 'Indigenous knowledge' could be digitised and preserved was a feature of the LKC program from its very beginnings, nine years ago.

1.2 A BRIEF HISTORY OF THE PROGRAM

The Northern Territory Library began devising its 'Indigenous Knowledge Centre' concept in the early 2000s after being approached by a number of communities looking to explore alternative library services. The initial concept was largely inspired by an idea that residents of Galiwinku had been developing since the late 1970s. Consultations with the Galiwinku community revealed that they had a vision of a physical space that would celebrate and revitalise local culture. Challenging the well-defined boundaries between various cultural institutions, the Galiwinku 'Knowledge Centre' concept included an interpretative centre, a keeping place, a museum and a library. The overarching goal of the Knowledge Centre was to improve access to collections of relevance to the community, enable the creation of new documents/recordings, and give people a measure of ownership and control over these collections. Richard Gandhuwuy Garrawurra (in Taylor 2004) described the Knowledge Centres as:

> '…breathing places…they keep our culture strong for our children…look after our traditions, songs, language, stories and artwork…bring back the things that guide us today for the future…combining a meeting place for traditional business with modern library services.'

The concept was adopted by the Northern Territory Library and translated into a model of information and library service delivery. Under the original 'Indigenous Knowledge Centre' model proposed by NTL, a 'hub' community with a functioning library service would manage a digital collection that could then be distributed (it was initially thought via the Internet) to other communities within a regional network of linked databases.

After a two-year pilot program in a number of remote NT Aboriginal communities, Galiwinku was chosen in 2002 as the site for the first formal (non-pilot) Indigenous Knowledge Centre (Australian Broadcasting Commission 2003, Northern Land Council 2002). The marriage of digital technology and traditional knowledge was emphasised at the Galiwinku Knowledge Centre, through a custom built '42 level relational database' that aimed to preserve local knowledge and represent the way that Yolngu people understand the natural world (Rothwell 2003). This ambitious task eventually became too unwieldy and the database system fell into disuse.

Following an audit of available database systems, it was decided that a common– and more generic– system be utilised in the Libraries and Knowledge Centres program. The Pitjantjatjara Council's *Ara Irititja* system was chosen and re-branded the 'Our Story' database.

1.3 The Our Story Database

Our Story is essentially a File Maker Pro application originally developed in the mid-1990s by the Social History Unit of the Anangu Pitjantjatjara Yankunytjatjara Council (APY Council) (Hughes & Dallwitz 2007). The database was developed in response to requests from senior Anangu[1] for improved access to the records of past anthropologists, missionaries and others who had documented their lives during a period of cultural change. After a fifteen-year period of software development, user testing and interface refinement the Social History Unit's *Ara Irititja project* had devised an appropriate database template for community-based archiving projects in a remote Aboriginal context.

While the interface and functionality of the *Ara Irititja* system were regarded as proven in the Indigenous community context, some necessary modifications were nonetheless required before implementation could occur as part of the NTL model. The system required enhanced import/export functionality so that metadata could be migrated into potential future database systems. Additional scope was also required for customisation of the interface by each community; without this front-end flexibility, community/user acceptance and ownership of each database may have been jeopardised. A PC version of the system was also needed for those sites not running Mac OS X; the preferred environment of the original software designers.

Although the *Ara Irititja* project had been using the software for many years across the Anangu Pitjantjatjara (AP) Lands, NTL's model of delivery was going to be quite different. NTL's version of the software was embedded in the Libraries and Knowledge Centres program with all of its associated support, training and employment opportunities (see below). The *Ara Irititja* system was designed originally for use within the relatively homogenous cultural and linguistic region on the AP lands – where a series of mutually intelligible western desert dialects and languages are spoken – and was set to display Pitjantjatjara names only. The NTL system, in contrast, was to be implemented across numerous Indigenous communities covering approximately fifteen distinct cultural and linguistic regions. *Our Story*, therefore needed to be flexible enough to ensure that each of the relevant local Indigenous languages could feature not only in the database title-name, but also throughout the interface; icons, buttons etc. With this flexibility enabled, the program could conform to the high priority that most communities place on the continuance of local Indigenous knowledge and language.

1.4 Method of Implementation

Each community was then able to create an Our Story database, unique to their region, and administered by a locally employed Community Library Officer (CLO). Populating the system with newly digitised material was the main responsibility of the CLO, with support from NTL project staff. This model differed significantly from the APY Council's method of implementation, which involved the creation of three databases: a community collection; an Anangu men only collection; and a collection for Anangu women only. The community collection is the only version of the archive to be distributed throughout the Pitjantjatjara and Yankunytjatjara lands, while senior Anangu men and women manage the other two archives separately. The Ara Irititja project also differs from the LKC method of implementation in that the

[1] A generic term used in a number of Western Desert Languages to refer to Aboriginal people.

majority of content populating their archives is entered at a central location. Corrections and annotations are contributed by local people at each of the community sites and then synchronized with the main database in Adelaide. A new version of the database is then re-distributed to each of the participating sites at regular intervals throughout the year.

During the initial implementation stages of the LKCs, NTL provided intensive training to local CLOs to enable their involvement in the systems being installed, set-up and populated with local content (the nature of this training is discussed in detail below). Each of the participating communities received additional financial support to purchase suitable digitisation equipment and software, based on recommendations from Northern Territory Library's Information Technology staff. Simple English documentation was also created, including the *Our Story* Procedures Manual which contained step-by-step guides to importing items, adding new metadata into the system and advice on digital standards.

Finding content for the databases was in most cases not difficult, as many of the community libraries had already begun to store hard copies of important local historical and cultural materials. The LKC in Wadeye for example had already received hundreds of repatriated photographs and sound recordings from anthropologists and missionaries, ready for inclusion in their *Murrinh Nekinigme* (Our Story) system. The *Our Story* databases in most participating communities have been quickly populated with similar material and now contain a mixture of repatriated digital content from cultural institutions and private collections, as well as born digital materials deposited by local schools, researchers, community members and visitors. The vast majority of data held in these collections is either digital image, audio, moving image or textual metadata.

These database systems have allowed for materials from a range of different and distinct collections to come together for the first time as a unique compilation in their own right. For example, each item in the database is associated with its original catalogue information as well as being enriched with annotations added dynamically by local library staff and other interested community members. With the diversity of archived materials and the emphasis on community directed population of the *Our Story* databases, these systems have become 'organic' in the way that they expand and change over time. This combination of content and descriptive data has meant that each database is a valuable resource of not only local historical materials but also Indigenous perspectives on these histories. Researchers and visitors to these communities are beginning to show interest in gaining access to these collections and the library is in the process of advising each Shire authority of the issues associated with access to Indigenous digital collections.

1.5 Strengths and Weaknesses of the Our Story System

The level of interest that *Our Story* has generated and the ease with which it can be used indicates that the system is working satisfactorily in the LKC context. The *Ara Irititja* Software is now being used by other Indigenous organisations across Australia and, in spite of its age, the system remains the most suitable product on the market for the management of indigenous community digital heritage **.** Some of the major advantages of the current *Our Story* system are that it:

- Is an off-the-shelf product that is relatively simple to install;
- Is inexpensive to maintain;
- Is easy for NTL to support;
- Is user-friendly (particularly for Indigenous users) and;
- Supports a wide range of media formats, documents and objects.

Despite the obvious strengths of the system, NTL recognised certain limitations that required immediate attention, including the need for improved import/export functions (so as to permit the manipulation and backup of metadata), and an increase in the number of file formats that could be used within the database system. While these changes were made during initial deployment of *Our Story* a number of other limitations have subsequently been identified and these will need to be addressed in the next generation of software design. The evaluation of the LKC program (Nakata et al 2006:69) also identified a number of issues to be rectified, including that:

- The underlying metadata structure cannot be modified by anyone other the original developer;

- Indigenous knowledge structures or categories are not represented or incorporated into the database design;
- Annotations are recorded in a single 'information field' without clear attribution, and;
- There is no way of ensuring conformity and consistency in formats for dates, people's names, place names etc are used.

Improvements to the system would also need to include the development of a more flexible and customisable user interface and the adoption of a standard database language like Structured Query Language (SQL) to increase the speed of the database. The *Ara Irititja* Project is committed to changing the software's current platform and is now in the process of developing a browser-based system with input from the Northern Territory Library. Further information on the specifications for the next generation of this software are provided in the final section of the report.

SECTION 2: IMPLEMENTATION ISSUES

2.1 DIGITAL REPATRIATION

Indigenous communities with an *Our Story* database have become more and more aware that research and cultural institutions, both nationally and internationally, hold materials that are of direct relevance to their heritage. This awareness has now led to an increasing demand upon collecting institutions to find effective mechanisms to improve access to and in some instances return materials to the relevant community. For audio-visual collections, and to a lesser extent physical object collections (via photos or 3D animation), digital repatriation is being demonstrated to be the most effective option for those communities with a digital library or archive.

For the first time these communities have had the opportunity to safely store and access materials that were once kept within the custodianship of non-Indigenous professionals or in private collections. While hard copies of these materials would have been returned to communities in the past, the emergence of the digital archive has proven to be a far better option in terms of accessibility, usability and security. A scanned photograph housed in a locally run community archive, for example, can be printed multiple times and accessed regularly without the source item deteriorating.

Most of Australia's cultural institutions now express a genuine willingness to develop digital repatriation activities, but lack well-defined protocols and procedures that are needed to 'mainstream' the activity. Whilst these institutions may have excellent procedures in place to see items digitised for research or publication purposes, this does adequately cover some of the more complex issues that arise in digital compilations. The dynamic nature of these community digital archives means that repatriated materials are often utilised by being printed, annotated, exported, redistributed and/or remixed; uses not covered by conventional agreements relating to the creation of copies for research or publication.

The Northern Territory Library has promoted *Our Story* as a way of preserving cultural heritage and, as a consequence NTL have been challenged to find adequate resources to help a number communities in their digital repatriation endeavours. Given *Our Story's* foundations in the *Ara Irititja* project[2], and the evident need to populate the database with locally relevant materials, seeking out collections to be digitally repatriated has been an entirely natural consequence of the system's implementation. Despite the fact that 'digital repatriation' does not constitute a formal objective of the LKC program, Northern Territory Library staff do support LKCs in submitting requests to collecting institutions for digital copies to be made of selected items. The high-level of community enthusiasm to access these collections, the willingness of most collecting institutions to see repatriation occur and the opportunities that digital technologies bring to the process (in terms of storage, security, long-term access and re-use of items) mean that digital repatriation is only going to expand in the near future.

To fully document the process of actually carrying out a digital repatriation project in partnership with Indigenous communities is beyond the scope of this project, however a simplified outline of the steps involved is provided below. Far more definitive work needs to be conducted in this emergent area of practice.

[2] The Ara Irititja project in South Australia has been using the practically same database system for the purposes of digital repatriation since its beginnings. The project continues to identify materials to be added into their ever-expanding archive.

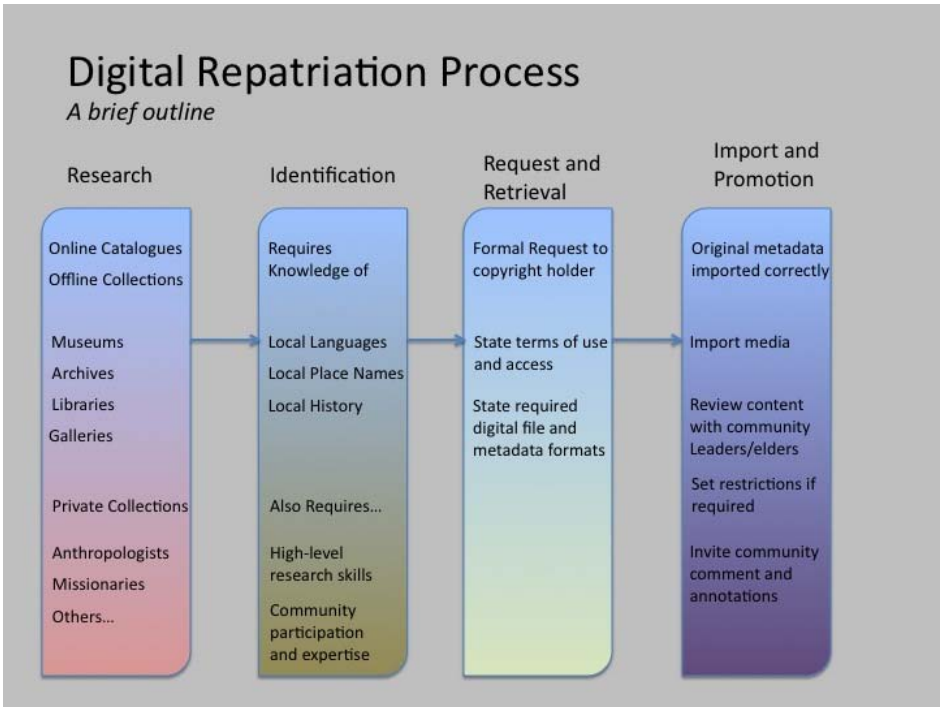

FIGURE 1: A BRIEF OUTLINE OF THE DIGITAL REPATRIATION PROCESS.

Step 1. Research: Awareness and Familiarisation

The initial stage of conducting research into existing collections requires knowledge of collecting institutions and how their catalogues and series lists are best accessed and utilised. In assisting communities with this initial step the Northern Territory Library promoted what it regarded to be useful and relevant collections to all CLOs employed in remote libraries. Highlighted collections included the National Library of Australia's portal to significant online pictorial collections *Picture Australia*, the Australia Institute for Aboriginal and Torres Strait Islander Studies audiovisual catalogue, and the National Archives of Australia online photo-search facility. Other collections, such as the Northern Territory Archive Service's oral history collection or the Strehlow Research Centre's audio-visual collection, were also promoted as useful sources of material for potential repatriation, although they have not yet developed online catalogues. As the majority of Indigenous clients in remote communities have a relatively rudimentary knowledge of the World Wide Web and were generally unacquainted with these collections, these initial stages could be described as 'awareness raising' and 'familiarisation' with significant collections.

In many communities people knew about the existence of private photographic collections but were unsure about how to contact the owner or how an agreement for access could be negotiated. Finding private collections can be an extremely time consuming and seemingly unending business. The *Ara Irititja* project for example have been collecting materials for their archive for over fifteen years and yet still continue to unearth new private collections. The susceptibility of these collections to being either damaged or lost means that there is an urgency to copy and preserve these materials as soon as possible.

Step 2. Identification

Combined with the first stage in repatriation, described above, is a process of careful identification of materials of direct relevance to each community. Finding these items can be a difficult process, though is greatly enhanced if the researcher has a sound knowledge of the cultural, historical and linguistic character of the Indigenous client-base in question. For example, in order to identify materials of specific relevance to the community in and around the township of Tennant Creek, it is best if the researcher has some knowledge of local places names, of the particular languages spoken in the area,

of the relevant orthography for those languages, and also understands that some of the material held in collecting institutions is likely to be of a sensitive or restricted nature. As many of the Northern Territory Library's Indigenous clients maintain specific ties to particular cultural, linguistic and geographic regions it is very important to access only that information which is of relevance to each particular region. Having access to material that relates to (or may belong to) a neighbouring cultural group can be regarded as highly inappropriate and/or irrelevant.

Identifying the 'right' materials for a client base should therefore involve familiarity with the community/region in question. The CLO or other community members are likely to possess adequate knowledge in this area, although the participation of knowledgeable male and female elders may also be required in determining how access restrictions might need to be applied to some of the material. The identification process would, however, often also require high-level research skills that most CLOs do not currently possess. Adequate support for this research and identification process must therefore be built into future digital repatriation initiatives from the outset.

This identification stage of the process may be conducted remotely if collections are featured online, however this is often not the case, making it necessary to visit the collecting institution in person. Accessing private – non-stitutional - collections is a far more complex process and can be influenced by a range of factors such as the collection holder's current relationship to the community, their proximity to the community, and their confidence in the library's ability to responsibly care for the materials.

The Northern Territory Library partially supported visits by Anmatyerr and Arrernte people from two different LKCs to conduct this kind of research and identification work interstate. In one case, two CLOs from the LKC at Ltyentye Apurte and the NTL staff member traveled to Queensland to investigate a private photographic collection depicting life on a cattle station for Arrernte people in the 1930s. An Anmatyerr Regional Council representative and the NTL staff member visited both the State Library or South Australia and South Australian Museum in Adelaide to identify Anmatyerr film and photographic materials in the second case. In both cases a formal request had to be made to firstly access the relevant collections for research purposes and secondly to obtain digital copies of some of the materials. The process for obtaining copies from the non-institutional copyright holder was far more difficult and had to be developed via lengthy negotiations with the photographer. This process is discussed further in the following section.

Step 3. Request and Retrieval

Once collections have been discovered and relevant materials identified, a period of negotiation with the copyright holding institution or individual begins. After the initial request is made to access the materials, a second written application is then required to have the material digitized (if not already done) and provided to the LKC in a suitable format. In order to streamline the digital repatriation process a form letter or MOU agreement could be created when requesting copies of materials for use in an Indigenous data archive. It is advisable that the institutional or non-institutional copyright holders receive a written request stating at the very least: (a) how the data will be used and (b) what access conditions may be applied. Further information could include:

I. Whether the project is of a non-commercial nature;
II. What the proposed geographical extent of access is, i.e. global (online) or localized (offline or intranet);
III. Who the envisaged users may be;
IV. The delivery platform;
V. If the platform caters for different levels of accessibility designed specifically for indigenous materials (i.e. sorrow and sensitive materials), and;
VI. What uses of the material will be allowed, such as screen viewing, print outs and ability to add annotations.

In the case of the LKCs, data-use agreements clearly stated that the recipient database collections were of a non-commercial nature with the objective of enabling local community access only. They also stated that the system was essentially an offline database that catered for Indigenous concerns regarding sensitive material; meaning that the database software included functionality to restrict access to 'sorrow' or 'sensitive' material. Both private and institutional

copyright holders were satisfied that each *Our Story* database was the property of a particular community and that it would be maintained by a locally employed, in most cases Indigenous, library officer.

Donors often required that the receiving organization (the LKC) would cover the costs of digitization and metadata entry. This was not always the case though and private, non-institutional donors would often contribute their time and knowledge without an expectation that they would be reimbursed. Institutions however, will normally charge a standard fee for digitization and the harvesting of metadata. Obviously, it is very important that all requests state the digital formats that are required for ingest into the receiving archive both for file formats (image, film and audio) and also for the associated metadata.

Step 4. Importing and Promoting

Upon receiving data from the donor organisation or indvidual, CLOs were highly involved in importing the material into the local *Our Story* collection. Donors often required that original catalogue information – including accession numbers - were included in the *Our Story* system so that each item could be traced back to its original source within their own collection[3]. While the digitised content was relatively easy to obtain and import, bringing across the associated metadata was often a great deal more complicated. In fact some *Our Story* collections initially suffered from mismatched metadata; meaning that metadata was coupled with the incorrect items. While there is general agreement on file format standards for most forms of digital content/media (with the possible exception of film/video) there is still some work to be done in standardizing metadata harvest and importing methodologies. Failure to standardise in this area has meant that there is still some confusion about the most efficient way of mapping and sharing this type of data between institutional repositories and smaller community operated digital archives. The National Recording Project, the Northern Territory Library and the National Library of Australia are looking to trial a more effective metadata migration process at some stage in the near future (see below).

Following this import process it is essential that the new materials be shown to elders and leaders in the client base. Access restrictions may be applied at this stage if required. The new dataset should then be promoted to interested users/clients and made discoverable via database search mechanisms. Providing scope for the addition of annotations or 'social tags' to materials is also a key component to the *Our Story* system and has been very popular with LKC clients. Experience has shown that users will naturally invest more into the management of the entire dataset when they have the opportunity to enrich it with local comments that sit alongside the original catalogue descriptions. Access to this data and the functionality to add commentary enables users to not only be contributors, but to enact a degree of control over the productive process. This in turn generates unique resources and new forms of cultural production. (The copyright status of these annotations is dealt with below in Section 2.3).

2.2 Principles, Protocols and Guidelines

In the past four years enthusiasm for the *Our Story* database has seen remote libraries digitise and store over 45,000 items relevant to the Indigenous communities of the Northern Territory and while NTL does not own or administer any of these collections (as described earlier) it does have the responsibility of providing advice on the best ways of acquiring and preserving this cultural heritage.

Is has been the combination of (a) technical solutions in the Our Story software (as described above) and (b) the LKC programs willingness to work broadly within the cultural protocols of Aboriginal communities of the Northern Territory that has produced its success. Some of the principles of the LKC program that have been critical to the programs success include:

[3] This became very important at one of the LKCs where a repatriated collection from a museum was accessed by a visiting researcher browsing the local Our Story database. The researcher subsequently wished to obtain permission from the source Museum to publish a number of photographs that she had identified in the database. When sending through her request she referenced the Our Story record number for the items and not the museums accession numbers. This created unnecessary confusion and the museum became concerned that the LKC had not entered the correct original collection metadata as specified in their agreement.

- Emphasising *local access* to cultural and historical materials;
- Ensuring that the day to day *management of the collection determined locally* and usually by an Indigenous person;
- Facilitating the return of cultural materials some that some *degree of control over their dissemination* can occur;
- Encouraging community comments or *annotations* to be made to repatriated materials; and
- Providing a *safe place for cultural and historical materials* to be preserved.

Each *Our Story* database is managed locally and decisions regarding its access and use are determined at the community level, usually by a library officer and someone from the local governing body. Similarly, the creation and collection of these materials has always been the responsibility of the local LKCs. Until recently this has meant that Community Government Councils could nominally take responsibility for the collections via a decision making process involving locally appointed councilors. Local Government reform in 2008 has meant that 'ownership' of the database collections now resides with larger Shire Councils that incorporate many communities and cover multiple linguistic and cultural boundaries. Regardless of these changes to local government NTL will undoubtedly continue to provide on site advice on collection management to LKCs and work closely with CLOs in the administration of their *Our Story* collections.

To date, the Libraries and Knowledge Centres program have not had the opportunity to translate these working principles into a set of guidelines or protocols. While the Aboriginal and Torres Strait Islander Library and Information Resource Network protocols have certainly been promoted and distributed to all LKCs (and are utilised by the Northern Territory Library for internal matters), they do not adequately cover some of the more specific issues pertaining to the management of digital collections. The Northern Territory Library now have a series of *program-specific guidelines* – currently in draft form and under review – that can better deal with the management of Indigenous digital collections (Nakata et al 2008:24). Key issues that are addressed in these guidelines include: how existing digitization practices be adapted to better accommodate Indigenous-specific data; how Indigenous knowledge and intellectual property could be safeguarded in these collections; and how the library can put in place arrangements to simultaneously increase access to Indigenous knowledge and while respecting the public and private domains of Indigenous knowledge.

From an ethical perspective any institution dealing in Indigenous knowledge must respect and abide by local Aboriginal customary protocols. These protocols guide and direct decision making over information distribution and are firmly embedded in relationships between people, families and geographic locations. Groups of people, rather than individuals, will therefore have customary rights to this knowledge and its dissemination. In 2008 the Northern Territory Library provided input into a series of guidelines for data management developed by the Natural Resource Management Board (Northern Territory). Contained within these guidelines is a very useful explanation of how the kinship and land owning systems of people in the Northern Territory shape the nature of information management and the development of archives (Holcombe 2009:7). Designed specifically for the NT cultural context, these protocols could be easily adapted and applied to the database management issues within the LKC program. Protocols for data management in other parts of Australia, or for national projects, will have to be broad enough to cater for different Indigenous cultures; for example between Torres Strait Islander, remote and urban Aboriginal contexts.

The Natural Resources Management (NT) guidelines also stress the importance of working with existing libraries, Indigenous media groups or other Indigenous organizations (including regional land council offices) where they exist. The State Library of South Australia (SLSA) in the management of their Indigenous collections has also adopted a similar practice. The SLSA will not grant permission for Indigenous materials that have been classified as 'restricted' to be reproduced for external use until it is satisfied that approval has been given by the relevant indigenous owners (usually represented by an Indigenous organisation)[4].

[4] The SLSA brought in experienced historians and anthropologists from the Pitjantjatjara council to identify potentially sensitive or restricted material.

The Northern Territory Library has also actively contributed to the development of protocols for the National Recording Project for Indigenous Performance in Australia[5]. The protocols follow the entire process of knowledge management, from the initial stages of making a digital record (taking a photograph etc), through to archiving the materials and finally their redistribution back into the communities of origin. The protocols emphasize the need for a researcher to obtain important information at the time of carrying out research, including who has rights to decide future access and how the materials might be best returned to the community. The protocols also suggest that Indigenous content requires an expanded metadata schema that better represents Indigenous knowledge. Information such as how the record/s may to relate to linguistic regions, who holds rights 'perform' or 'speak' for this material and how access and suitable use information might be managed. This information would help in determining what might be restricted and to whom, what might be suitable for community-only access through local archives, what is suitable for greater public access (via the web) and what might be suitable for commercial release.

The National Recording Project's archiving protocols are yet to be tested but will most probably be trialed in a partnership between the Northern Territory Library, Charles Darwin University, Australian Institute of Aboriginal and Torres Strait Islander Studies and the National Library of Australia. The data management strategy would comprise of uploading new data to a shared repository and transferring it to a safe archive in Canberra via Australia's Academic and Research Network (AARnet). The archive would 'ingest and map metadata for discovery (or not) and/or access (or not) according to the data's status' as determined at the time of recording/documentation in the field'. (NRP 2008) If the data is categorised as suitable for 'community discovery' then it would be transferred to the Northern Territory Library server via AARnet. From here the materials would be delivered back to the Indigenous communities of origin via the Our Story database or similar future software interfaces. Data identified as suitable for 'public discovery' will be made available through the National Library of Australia's web portal and the Northern Territory Library public web server.

Initially relying upon the pre-existing relationships with Indigenous communities established by the participating researchers and the Northern Territory Library, this project could demonstrate an excellent model for Indigenous knowledge documentation and (an inbuilt cycle of) repatriation. Establishing inter-institutional cooperation and coordination at the national level and the provision of local digital access facilities at the community level will be considerable challenges for the project.

In a similar vein to the National Recording Protocols, the Natural Resources Management Board (NT) protocols follow the 'stages' of data creation from collection, through to storage and repatriation. The guidelines stress the importance of Indigenous access to collections. The protocols state that, where they exist, local community archives, keeping places and Libraries and Knowledge Centres should be utilized as sites for community access to any information collected. All newly created materials should be deposited with these centres and stored in accordance with community protocols (as defined by customary rules). The guidelines also advocate that user-friendly and interactive technologies be should be utilized to engage and encourage Indigenous users and that the data is accessible upon request to Aboriginal people who may have interests and rights in it. Where community data archives are not present centralised storage (in a digital or physical archive) may be the most secure and realistic option. Where data is not stored or made available locally it should be stored in accordance with relevant legal, ethical, and Aboriginal community and cultural guidelines.

While the LKC model of community archiving has informed both the National Recording Project and Natural Resource Management (NT) protocols and guidelines, the Northern Territory Library is yet to formalize its own clear guidelines on the management of Indigenous data. However, as the *Our Story* databases are not the property of the Northern Territory Library it would be entirely upon the Shires Council (the nominal owners of the collections) to adopt these protocols as professional guidelines. NTL acknowledge that such protocols would need to incorporate the following:

- How access to selected content from Our Story databases would be negotiated

5 http://www.aboriginalartists.com.au/NRP.htm

- Developing a metadata schema appropriate to Indigenous cultural materials, that can be used in both the Our Story database and the Northern Territory Library's digital repository.
- Developing procedures for capturing relevant Indigenous information at (a) the point of deposit, (b) selection for digitisation (including language group or community affiliation)
- Using prompts to identify Indigenous materials within the digital repository and library catalogue.
- Creating of an audit trail of 'reasons for restriction' within the digital repository and the next generation of Our Story database.
- Establishing procedures for responding to requests to have materials restricted;
- Developing a 'take down' policy with a carefully spelt out set of micro-procedures.
- Utilising the expertise of CLOs to assist in the identification of sensitive or restricted content. (An Indigenous Advisory Group may also be introduced to assist with broader policy development for the archives).
- Restricting access to some cultural materials (despite being freely available under the Copyright Act)
- Creating fact sheets to alert copyright holders and donors of material to Indigenous sensitivity issues.
- Provide information to donors about how the Northern Territory Library manages sensitive content e.g. take down policy, access provisions, etc.

2.3 Annotations and Contextual Information

There are major intellectual and cultural property right issues pertaining to the establishment of digital collections like the *Our Story* databases. Key points of concern relate to libraries and copyright law, managing indigenous intellectual cultural property, and complexities arising from the creation of 'organic' databases. A discussion of some the central issues is presented below, but to adequately cover each of these points in detail is however far beyond the scope of this report.

Almost all of the *Our Story* databases contain 'contextual' information from a range of sources. This information can be broken down into the following areas:

- The original metadata;
- Additional reference material sourced from other published documents; and
- A description of the where the material originated from.

It is now an expectation that CLO's will not only add this kind of contextual information, or 'stories', into the database themselves but will also assist other community members in enriching the dataset. Databases that allow the entry of additional information – either by incorporating new material, or annotating existing material, for example by adding text that describes people and events depicted in a photograph - are known as 'organic'. Organic databases have considerable value in recording family, local and cultural histories in an accessible way.

A sizeable percentage of the material now finding its way into these collections has originated from projects being run within the local community. For example the *Anmatyerr Angkety* database in Ti Tree contains well over 200 items, including photographs, documents, videos and audio files that were created by a University research project looking into the cultural values of water in the region. At present more detailed information about this project, or any other project, is being entered into a 'catch-all', generic 'information' field. All of the associated information, such as the goals of the project, who was involved, how long it ran for etc is entered into the 'Information' field.

Other types of contextual information entered into this single field include reference to published sources. An audio interview with an elder for example may discuss historical events that have been documented in published works. If a user wished to enter information from one of these published sources into the system they would have to do this by typing it into the 'Information' field, rather than a distinct 'annotation', or 'linking reference' field. Lacking a proper annotation function is a serious limitation in the *Our Story* software noted during the initial LKC evaluation in 2006. The authors of the

report regarded this limitation as likely to 'affect the quality and reliability of information contained in the databases' (Nakata et al 2006). Although conventions exist to manage the entry of this data – for example, external sources of information should be referenced properly – maintaining consistency in these entries is very difficult. Similarly, if community members wished to make comments or annotations on items they would also have to do so in the 'Information' space.

As mentioned below the current Our Story software could deal with annotations in a far more inventive way. Users could be prompted to identify themselves in some way when making an annotation. This kind of functionality would help overcome some of the copyright and intellectual property issues that may arise in the future. Once again, while there are conventions regarding the attribution of annotations, it is entirely up to the contributor to submit this vital information.

The vast majority of annotations currently being added into Our Story are contained within single text entries. In some cases however commentary has been added by making new video or sound recordings (See Case Study 1 below). These new recordings are entered into the system as separate sound files or videos and they in turn become a unique record in their own right.

Case Study 1: Recording Stories at *Mer Ilpereny*[6]

In 2006 the Anmatyerr Library and Knowledge Centre hosted a secondary class from Ti Tree School researching the political history of their region. Two elders were invited to attend the session and assist the young people in their research. The Anmatyerr Angkety (Our Story) collection quickly became the focal point for their discussions and, during their journey through the database, the elders provided meticulous descriptions of some of the archival images complete with historical context and Anmatyerr cultural information. One knowledgeable elder was particularly interested in a collection of historical photographs sourced from the State Library of South Australia (SLSA) and was pleased to have his stories recorded into the database system.

The re-entry of these photographs into the Ti Tree community, for the first time since their creation in the late 1920s, inspired a string of related activities. The elders organised a trip to the site of the old 'Faith Mission', at a place known to Anmatyerr people as *Mer Ilpereny* (Harding's Soak). The majority of the conversation at the site revolved around the SLSA images and spanned key historical events for the area: the 1928 Coniston massacre, the first missionary on Anmatyerr country and an old sheep and goat farm where many of the men had worked when they were young. A young man recorded the conversation using a portable digital recording device and each sound file was later entered into the Anmatyerr Angkety database for community access.

From this simple photo elicitation exercise the elders were able to supplement an archival photographic collection with relevant and valuable Anmatyerr perspectives: place names, people's names, how people and places were linked by the kinship network and other stories from their lives. Unsurprisingly the original SLSA records featured only the most rudimentary catalogue information and had not even recognised the people pictured in these photos as belonging to the Anmatyerr region.

Distinguishing between the different types of contextual information being entered into the databases is critical to determining how different 'rights' might be assigned to each entry. The information recorded and entered into the system described in Case Study 1, for example, was of considerable value and should be properly attributed to the knowledge of these elders. The present *ad hoc* approach to the addition of contextual information, as described above, makes the identification of this material problematic.

[6] Taken from Gibson, J. (2007). People, Place and Community Memory: Creating Digital Heritage Databases in Remote Aboriginal Communities. Australian Society of Archivists Conference, Alice Springs

When requesting material from either an institutional or private collection, each LKC has had to ask for specific permission to display the items in their *Our Story* database, as outlined above. In most cases however, the LKCs have not made it explicit to the copyright holder that additional information may be associated with each item. Compilers of digital collections should be aware however, that copyright holders may indeed object to their work being 'tampered with', or transformed in some way i.e. with the addition of extra contextual information. Intellectual Property specialists do not regard this as a particularly critical risk for database/archive compilers because 'if users are simply adding new material or annotations (i.e. descriptions of photos), then this is unlikely to involve 'transformation' that implicates copyright owners' rights (although moral rights may arise)' (Hudson 2006:93).

There is far greater risk of copyright infringement though if the annotations of a user-contributor are reproduced without permission. Database compilers should therefore seek *expressed* and not assume *implied* permission from user-contributors to reproduce their annotations:

> 'If a user-contributor writes an annotation for a photograph on a database, there may be an implied permission for the compiler to reproduce that annotation for inclusion on the database, and to publish the database with the annotation so included.' [However, it is] '…strongly preferable to rely on expressed permissions rather than implied terms' (Hudson 2006:89).

Moreover, database compilers also need to be mindful that where users can contribute content directly into a database there is always a risk that they will record personal information, or confidential information in ways that may offend or harm the person to whom that information relates. According to Hudson (2006:92) there are a number of options that might be adopted when attempting to avoid copyright infringement in the creation of an organic database, including obtaining assignments of copyright from all user-contributors, adopting an Open Content[7] system and making it a requirement of all contributions that they agree to an open content license, or alternatively creating an entirely new licensing agreement altogether.

Risk management strategies have been devised by NTL to avoid confusion over the use of annotations in the future. One such strategy is to clearly state, either in the introduction to the database or with signage positioned close to the computer terminal, that all user-contributions become the property of the governing body (in this case the Shire Council). NTL have also designed specifications for the next generation of software that include a mechanism for recording all user contributions and informing users of the copyright status of their information before it is added into the system. Following the incident described in the case study below, NTL drafted an information package on Copyright and Intellectual Property issues that could be provided to each LKC and the responsible Shire body. The package would contain information pertaining to libraries and copyright law, the management of Indigenous data, managing orphan works and how to attribute user-contributions in database compilations.

Case Study 2: Conflict Over Annotations

In one community the photographs of a past, and controversial, anthropologist were added to the local Our Story database. The photographs dated back some 70 years and featured portraits of revered male elders that had passed away many years earlier. The Community Library Officer showed these images to a community member who possessed an intimate knowledge of these men and their life histories. Together this man and the CLO began to enter a number of detailed stories into the system that related to each of the elders, including their affiliation with 'country' (traditional estates) and their relatedness to the present generation. As news of the anthropologist's collection spread throughout the community, more and more people began visiting the library. Whilst viewing this particular set of images, community members also began to browse the rest of the archive and add information to other collections.

[7] Open content is a relatively new concept relating to any type of content that is published in a format that explicitly allows copying and modifying of its information. Some versions of the Creative Commons license allow for this.

One afternoon the man visited the library and printed out some of the records to take home with him. He informed the CLO that he intended to write some notes on each printout and return the next day to enter new information into the database. He returned the next day irate and confused after discovering that all of the images had their copyright attributed not to his community but to the donor organization, which he considered to be antagonistic to the community's interests. He had wrongly assumed that his annotations would also become the property of the donor organization. The man, who had already contributed so much to the collection, then began to refuse any further collaboration with the LKC. As word got out, community enthusiasm to annotate the collection also slowed considerably.

Despite that fact that the annotation entered by this person would legally remain the property of the local community government authority (now Shire Council), and not the organization that donated the photographs, trust in the system was severely damaged.

2.4 Training and Support

The provision of training and support to community members engaged in acquiring and preserving knowledge is regarded as one of the Northern Territory Library's primary objectives. The library began by commissioning research into possible models of computer and internet skills-transfer in a number of remote communities around Alice Springs. Recommendations were made for an Information and Communications Technology (ICT) training initiative that focused upon generic digitisation activities and computer skills. The report went on to state that given the lack of ICT training in remote communities any form of computer or digital media training would need to introduce a mixture of rudimentary Information technology, media and telecommunications knowledge:

> 'Poor literacy, while certainly a major barrier to the take-up of computer and Internet related technologies in the remote indigenous context, is not a reason to stall the delivery of ICT services. Literacy and other educational objectives may in fact be improved via the use of engaging, computer-mediated, audio/visual tools. A very basic level of computer and Internet awareness-raising would be the first step, leading on to project based learning designed to compliment community directions and capacities. In order for training to be effective it would need to take into consideration the low levels of ESL literacy, lack of awareness in online computer applications and the general lack of underpinning and practical knowledge of the online world' (NTL 2004).

Training in the *Our Story* system therefore also required an introduction to rudimentary ICT concepts and skills. Such training would incorporate simple computer operations (like saving files, creating text documents), using the World Wide Web, and using email. The trainee would quickly move on to develop skills in using digital media devices such as digital cameras, scanners, digital audio recorders, graphics tablets and so on. Gaining familiarity with these devices not only increases the trainees' skills in a range of technologies but, perhaps more importantly, gives them experience in the creation of their own digital objects. Knowledge of these objects, how they are created, utilized and stored, is of course essential to the production of a digital archive. Generic ICT training in remote Indigenous communities would generally feature the following overarching objectives:

- Raise awareness of online and digital technologies;
- Demonstrate the link between online communications and digital media devices;
- Encourage the creation of digital content (featuring local cultural/linguistic/historical/social themes).

It is extremely important that the training imparts both practical computer skills as well as underlying conceptual knowledge of networked and global communication. In order to achieve this LKC training would often revolve around the hands-on production of new digital content like short videos, animations, song or interview recordings, or digital photography. Beginning the training at this point would ensure that the trainee not only learns the process of storing different types of media in the database, but also develops the necessary skills in operating devices such as scanners, cameras, printers etc. The steps involved in digital media creation and preservation would then follow this generic process:

I. Saving the newly created content in the appropriate file format (a format that is ingestible by the database). This may also require an additional step of exporting, for example a movie project, out into a single file;
II. Re-numbering or renaming the file so that it might be recognised by the database (the *Our Story* system works on a sequential numbering system);
III. Navigating the systems file structure and moving the file into its appropriate location;
IV. Becoming aware of the difference between the 'back-end' of the system (where the data it stored) and its 'front-end' (where program applications and functions are presented to the user).

Once the material was added into the system successfully the trainee would then be required to login as an 'operator' and begin entering essential metadata. It was crucial that rudimentary metadata was entered almost immediately after import; without this information items would be 'invisible' when conducting searches. Essential metadata would include copyright information, people's names, place names and the collection source. More advanced uses of the system would be introduced over an extended period. Training was predominantly delivered in the community and once a year NTL would also offer four to five days of intensive training in Darwin. Advanced training would encompass the procedures for backing-up and copying the database as well as utilizing the entire suite of database functions i.e. print, sort, advanced searching, marking records.

2.5 Access and Restrictions

Like all cultural institutions, libraries are becoming increasingly aware of the complexities of dealing with Indigenous collections. In recent years the national and state libraries across Australia and New Zealand have formally acknowledged that their services and collections should 'be respectful of the public and private dimensions of Aboriginal and Torres Strait Islander materials'. The policy went on to state that all libraries need to become more aware of 'Indigenous information issues' (NSLA 2008). One of the principle reasons that *Our Story* was chosen for deployment in remote Indigenous libraries was precisely because of its capacity to deal with some of these specific 'information issues'.

The system uses a series of access levels that were established by the *Ara Irititja* project that and allow either an 'operator' or 'administrator' to apply different access levels to records. For example, items may be marked as 'sorrow' and made inaccessible to a general user of the software if they contain information pertaining to a person recently deceased. In the same way, an item depicting material that is distressing or upsetting to an Indigenous audience may be blocked from general access by being classified as 'sensitive'. When starting the *Our Story* database the user is presented with the choice of:

I. Browsing the collection freely without a password;
II. Entering the system with operator or administrator privileges;
III. Viewing materials that have been classified as 'sorrow', or
IV. Viewing materials that have been classified as 'sensitive'.

The first option is the only one that is not password-protected. If a user wishes to change access in order to gain access to materials marked as 'sorrow' or 'sensitive', or to utilise some of the 'operator' or 'administration' functions, they are prompted to return to the login screen and enter the appropriate password. Passwords for operators can be customised by a support or system administrator to make them more appropriate for their users, for example a password in the local language.

Table 1: User Rights and Access in Our Story.

Access Levels	General Browser	Operator	Administrator
Password	No password required	Password provided to CLOs	Password provided to advanced CLOs and NTL staff
Functions (in brief)	Browse the collection Print selected items	Add metatdata Add annotations Apply or remove 'sorrow' or 'sensitive' restrictions	Add and delete items and metadata Apply or change 'sorrow' or 'sensitive' restrictions Utilise all administrative functions

It is important to note that the Our Story system does not have a category of restriction for ceremonial/secret sacred material[8]. The reasons for this are partly historical. As already mention, developers of the Ara Irititja system, the Pitjantjatjara Council, originally established three separate collections: one for restricted men's content; another for women's restricted content; and an 'open' archive to be accessed by the entire Pitjantjatjara and Yankunyjatjara community. As all of the restricted/ceremonial material was contained within the separate men's and women's databases it was unnecessary to create an access level for this type of 'closed' content. Similarly, none of the LKC sites have imported – or shown any desire to import –restricted/ceremonial material into a database that is housed and displayed in a community library. When restricted (usually ceremonial) materials have been digitized and repatriated to an LKC the original discs containing the material are generally housed elsewhere in the community and the materials are not imported into Our Story. The 'restricted' category is the only one that can be described as truly 'closed', in the sense that access will certainly be denied to certain classes of people on the grounds of gender, age, social status, and kinship- and land-affiliations. However, it should be remembered that although a large percentage of ethnographic materials (a likely source for digital repatriation) are likely to contain restricted ceremonial information, not all ceremonies are closed. To add further complexity, ceremonies songs, dances etc may be restricted for one cultural and linguistic bloc but not for another. As developers of the Mukurtu database in Tennant Creek have noted, defining the boundaries between restricted and open content is not always clear to someone outside of the social-cultural milieu:

> 'The Warumungu system of accounting for the proper circulation routes for and production of cultural knowledge is a dynamic structure with two seemingly fixed points: open and closed. That is, in English Warumungu people often refer to cultural materials and knowledge as either being open or closed. But this apparent dualism is not a rigid divide. Instead, it marks two nodes in a continuum of accountability where factors such as age, gender, ritual affiliation, and country- associations combine to produce variables of openness or closure. So, for example, an ancestral song series might be restricted based on gender, it may be for women only. Or, a ritual dance might involve a particular ancestral track that crosses through two distinct territories. Thus, rights to perform the song are negotiated by those who are related to those territories' (Christen 2007).

The above example demonstrates that within a dynamic, living knowledge system there will always be variables that impact upon access to materials that have been restricted in some way. Any data archive that intends to deal in this type of content will therefore need to ensure that the functions for each access level can be customised and extra user levels can be created easily to meet future requirements if need be. More sophisticated restrictions based on personal log-ins, where the system checks a user's profile against the fine-grained restrictions applied to content (e.g. family, country, gender,

[8] In Central Australia restricted material is usually of a ceremonial/religious nature, this includes for example pictures of tywerrenge (sacred objects), secret body or sand painting designs, sacred songs and dances, sacred sites and rock art etc

status) have been included in the *Mukurtu* database with some degree of success. One of the principle lessons to come out of the *Mukurtu* example is that future data archives will need to provide the flexibility to add restrictions dynamically.

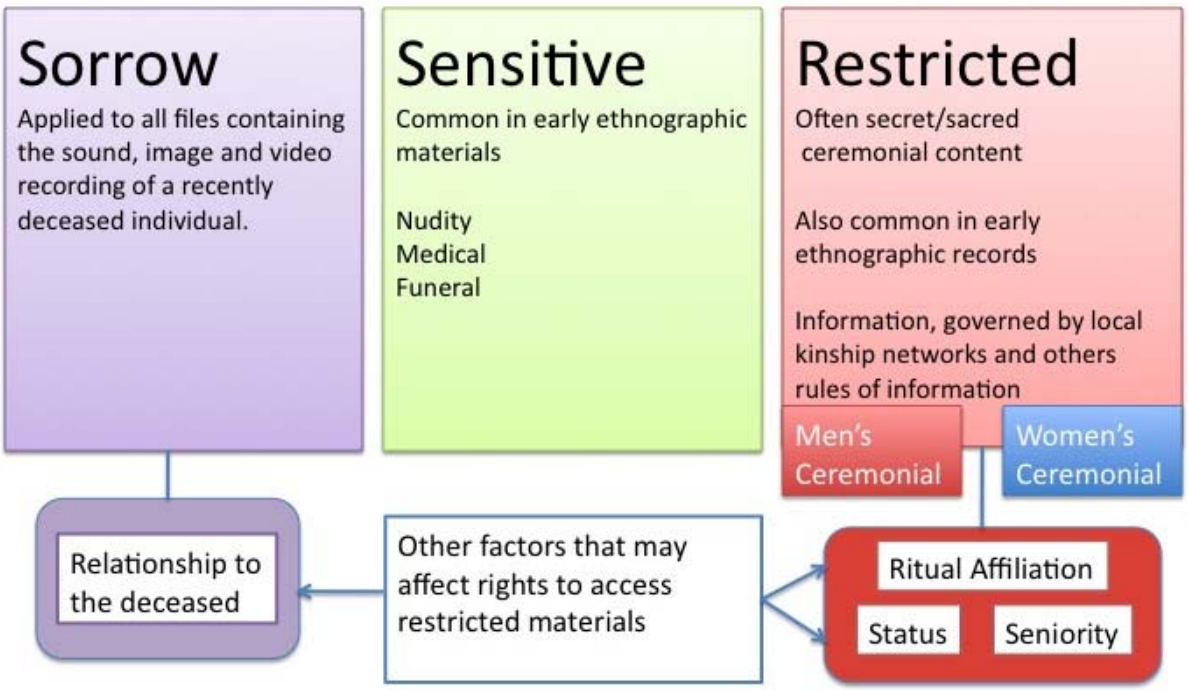

Figure 2: Common categories for restricting access to materials in an Indigenous digital archive.

As the *Our Story* databases were largely controlled and managed by Indigenous people resident in the community, it was in all cases it was local people's responsibility to manage these access issues. As mentioned above each library officer would receive training from NTL in the very simple steps of marking and restricting items as 'sorrow' or 'sensitive' to block them from public view where required. Data/content that made reference to an individual whom had recently passed away would be marked as 'sorrow' ensuring that an item (image, video or sound) would no longer be visible or playable to someone logged in without the appropriate password. In all cases however, the item's metadata would remain discoverable and would alert users to the existence of the item. Users could then ask an 'operator' (usually the CLO) to remove the restriction if need be[9]. In most cases, leaving only the name of the deceased as discoverable within the archive was more than adequate, yet in some instances users and operators were unhappy that even the name of the deceased could still be viewed. In one community the CLO removed the first names of all deceased people from the database and replaced them with initials or titles. For example, the entry 'John Smith' became J. Smith or Mr. Smith.

The 'sorrow' and 'sensitive' categories might be better understood as *warnings* to users who may be distressed if confronted with these items. Nevertheless, in order to safeguard against unintentional or accidental access to these materials, a restriction is placed on them so that they are discoverable but not accessible/viewable. Classifying material in this way most often determined by community members themselves, and would vary from one community to the next. For example in at one LKC over one hundred items had been classified as 'sorrow' whereas in another community, from within the same cultural and linguistic bloc, only one or two items had been assigned the 'sorrow' designation.

[9] CLOs would only act on this request if it came from someone within the community with the authority to make this decision. This would usually be someone directly related to the deceased.

SECTION 3: TECHNOLOGICAL ISSUES

3.1 CURRENT TRENDS IN INFORMATION TECHNOLOGY USE

The success of *Our Story* illustrates the high-level of interest amongst Indigenous communities in using digital media technologies as a means of accessing and sharing information. Indeed, across Aboriginal Australia digital media technologies are being used to preserve and provide better access to cultural knowledge for a range of different purposes (See Appendix A). Nonetheless, the digital divide between Indigenous and non-Indigenous Australians still exists despite significant efforts to improve the situation in the last decade[10]. Most remote communities continue to use 2-Way Satellite in order to access the Internet and, although this is generally effective, many of these services suffer from recurring outages and are not always properly maintained. Home ownership of personal computers in the Northern Territory's remote communities is extremely rare, and in 2005 was estimated to be as low as four per cent amongst the Aboriginal population outside of the capital city of Darwin (Department of Corporate and Information Services 2005:11). National figures also support the existence of a digital divide and show that 78.4 per cent of Indigenous people in remote areas do not use the Internet (Radoll 2006:15). This inequity in access, and the difficulties associated with maintaining telecommunications infrastructure in remote areas, provides an important backdrop to the introduction and up-take of emergent digital technologies.

As yet unpublished data shows that digital technologies like ipods, mobile phones, digital cameras and laptop computers are becoming increasingly common in remote communities. With the introduction of these devices we are also witnessing online practices developing and, unsurprisingly, it is the young people that are the most avid users of the World Wide Web. When accessing the Internet they are most frequently visiting Afro-American US hip-hop websites and watching various music videos on video-sharing sites like YouTube. Websites that are popular with young and old people include sports sites, online games and Internet banking services (Papandrea et al 2006:61). Email is not widely used and only a small number of young people are beginning to access sites like Bebo and Yahoo for messaging each other. Where more advanced computer skills are present, users have begun to explore using Google Earth and Peer-to-Peer (P2P) file sharing applications.

In those communities where some form of library or information service exists it is not uncommon to find a level of interest in certain forms of print media. Magazines, newspapers and locally produced publications (often that emphasise local languages and culture) can be extremely popular. Where information and library services are not available, community members will seek out external information resources – be it print media or Internet access - via the local Shire office, health clinic or school[11]. Where a library does exist it is often the only public space that people can come to, to read, interact with other community members, find information, access computers and develop familiarity with online systems.

Information literacy in remote communities has also been shaped by an engagement with locally produced and transmitted media. Locally produced newsletters, and community radio and television programs being the most common of these. The Broadcasting for Remote Aboriginal Communities Scheme, initiated in the mid 1980s, was hugely influential in developing an awareness of telecommunications networks, media and the rise of digital technology.

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[10] Relevant data on the poor condition of ICT access and equity in the Australian Indigenous context is widely available – see the *TAPRIC* report, the *Regional Telecommunications (Estens) Inquiry* (RTI) (2002) and further studies from CAEPR (Daly, 2001).

[11] Community service organisations such as community councils, schools or libraries, as Radoll (2006, p.12) has identified, often offer restricted or inhibited access. This means that people have less opportunity to explore or freely develop aptitude in computing and/or online technologies.

3.2 Offline and Online Digital Collections

Poor ICT access in remote areas, as well as fears relating to the vulnerability of web-enabled systems, has meant that offline databases have been regarded as the best option available for the provision of Indigenous digital collections. Thus a relatively conservative approach to entering the digital age has been adopted, where standalone databases remain offline and are not made accessible to a wider audience via the World Wide Web. This approach has been tremendously successful in terms of community support and confidence, but has also led to considerable inefficiencies in data management. For example, simple synchronization between two or more instances of an *Our Story* system is a tedious procedure involving a manual ratification process. Schools, aged care facilities and other community organisations that have shown great enthusiasm to contribute information to the databases have had to be delayed until a more efficient synchronisation process is identified. Future versions of the software will need to improve in this area and cater not only for improved synchronisation between multiple instances of an archive, but also better networking functionality over a Local Area Network or the Web.

Very real concerns persist amongst Indigenous clients in the Northern Territory that a web-enabled system could be predisposed to illicit and unregulated access. Those working in South Australia and Queensland appear to have reached similar conclusions, opting to publish CD- ROMs of content suitable for public consumption and ensuring that the collections are accessible in the community only. The physical location of data has also been a critical issue in all projects dealing with Indigenous data. The *Ara Irititja* project, for example, runs three databases (as discussed, one public and the two others restricted), which are kept on different machines and housed in different locations. In many other communities both men and women have been adamant that female and male *restricted content* be house in entirely separate locations and in no way be connected to each other via electronic means.

Furthermore, being cognisant of the principles that underlie the success of the *Our Story* databases – acknowledging local control and ownership of the collections - NTL have not pursued making these collections available to a wider audience online. The Northern Territory Library has instead begun a consultative process regarding what materials communities might consider making available for public use via their online digital repository, *Territory Stories*. This will entail a rather cumbersome technical procedure of physically exporting selected data from each of the databases and importing it into the digital repository located in Darwin.

3.3 Digitisation and Preservation

The Northern Territory Library's choice of digital standards for the LKC program is premised on the longevity of digital records and the avoidance of minority or proprietary formats where possible. While key players in digital archiving tend to promote standards that require expensive high-end software/hardware, the LKCs have had to look to less resource intensive options that will still provide the essential requirements for long-term digital preservation. High-end formats, particularly for uncompressed digital audio and video materials, can put tremendous strain on disk-space resources and backup systems and have therefore been regarded as unrealistic in the context of remote Indigenous communities. With these constraints in mind the Northern Territory Library have broadly adopted the digital file format standards proposed by the National Library of Australia. The underlying principles of the digital standards being used by the LKC program were described in an internal review as follows:

> 'Despite the broad range of digital formats and standards that are used to package captured material, statements by best practice sites suggest that underlying core conventions – bit mapping for images, pulse-code modulation for audio – provide a bed-rock of digital information from which any future application should be able to either read or translate the files to another format' (NTL 2005).

It was thus concluded that as a 'small player' in the field of digital preservation the LKCs can participate on an effective level by adhering to this 'bed-rock'. Details of these standards were included in the *Our Story* procedures manual and presented to CLOs upon installation of the software.

Metadata is also a key issue in ensuring the effective management of all digital archives; both for timely and accurate retrieval and to prevent the unintended duplication of contents. In the LKCs, metadata is also essential to managing permissions and tracking any potential intellectual property issues. *Our Story* metadata is currently exportable in common formats and should be easily migrated into new technologies when required. Eschewing the high-end tools needed to manage metadata in emerging formats, designed in large part to support more comprehensive metadata, will compromise the ability to add embedded metadata to objects in *Our Story* collections, unless other applications are identified. NTL have recently been in conversation with the Australian Institute of Aboriginal and Torres Strait Islander Studies and the Pacific and Regional Archive for Digital Sources[12] regarding appropriate metadata schemas for Indigenous collections that can also be migrated between repositories. While each of these institutions has preferred methods there is no clear way forward for a standardised metadata format for Indigenous collections.

Backing-up of the LKC databases requires each collection to be copied in its entirety onto another computer or an external hard-drive. Standard practice is for an NTL staff member, when visiting a community, to ask permission to back-up the archive onto a hard-drive, which is then transported back to Darwin or Alice Springs. This copy of the database is subsequently transferred onto a secure server, purely for preservation purposes. At the request of communities none of the *Our Story* databases backed-up by NTL are accessible while stored at either of the NTL sites in Darwin or Alice Springs. As some of the *Our Story* collections are now becoming very large in size (in excess of 60 gigabytes) this process can take a very long time. Nonetheless it is a very simple procedure that has successfully produced current backups of each community's collection for over four years. In only a few cases have communities needed to rely on an NTL backup copy of a database when their local copy had been corrupted. Similar digital archiving projects have adopted very different backup regimes, such as only copying the system's metadata files and not its media contents. This option would suit those projects that simply provide a copy of a centrally managed database to communities and only allow changes to metadata. Under the LKC model *Our Story* systems are however regularly having new media and metadata added *in situ*.

Because of their efforts in digital repatriation and preservation the LKCs have now come to be regarded as a suitable place, not just for digital objects, but also for the safeguarding of original items and artifacts. This is not an uncommon consequence of primarily digital preservation projects as both the *Mukurtu* and *Ara Irititja* projects have also had to develop related physical archives to house photographs, slides, film rolls, cassettes, artifacts and historical publications. Managing physical collections, particularly when they consist of not only print and photographic materials but also artifacts, has proven to be extremely difficult in the remote Indigenous context. Very few resources have gone into assisting communities in this domain and the increasing pressure on LKCs to store original, physical items is growing. The treatment and preservation of originals needs to be addressed in a more systematic way, including making explicit connections between original physical items and digital copies.

[12] http://www.paradisec.org.au/home.html

SECTION 4: PROSPECTS FOR DEVELOPMENT

4.1 FUTURE OF THE OUR STORY SOFTWARE

While *Our Story* has been well received in Libraries and Knowledge Centres across the Territory, it has become evident over time that the underlying software is showing its age and is unable to perform a number of commonly requested tasks. Recommendations from the Libraries and Knowledge Centres (LKC) Evaluation (Nakata et al 2006) stated that NTL should consider the future development of the *Our Story* database and the incorporation of new technologies in order to remedy some of these concerns.

Three years on, the Northern Territory Government and Pitjantjatjara Council have reached an agreement over the development of a new version of the *Ara Irititja* software. The new system will be known across the NT's public library network as *Community Stories*. Funding for this project came about as a result of NTL winning the Bill and Melinda Gates Foundation's 'Access to Learning Award' in 2007. After an exhaustive research phase exploring the various indigenous digital archives presently in use, NTL have produced a software specification[13] that, combined with the *Ara Irititja* projects own designs, will inform development of the new system. Core responsibilities of the system will include:

1. Effectively managing publicly accessible digital resources including repatriated digital materials (not designed to hold restricted material);
2. Operating as a principally offline database system that is locally administered and managed under community direction (extracts of approved material will be potentially incorporated into NTL's online *Territory Stories* collection following careful negotiation with individual communities);
3. Ensuring that library officers and community users, often of low-literacy levels and low-Information and ICT skills base, can easily import new media items and metadata;
4. Including fields within the database that may better accommodate indigenous-specific cultural information and including various access levels to cater for sorrow and sensitive content;
5. Incorporating a flexible interface that may be customised by different communities and which features relevant local Indigenous languages;
6. Enabling easy support by NTL staff who provide ongoing support for the application in the long term;
7. Allowing open standards so as to increase interoperability with current and emerging technologies and other databases;
8. Including a map search tool (and ideally integrate GIS data);
9. Including a distinct field for annotations;
10. Including XML-based export and import functionality;
11. Allowing the ability to relate or link entities in the database (e.g. people, places, animals, plants, subject, art, story, song, ceremony, seasons, event); and
12. Enabling alignment of transcripts of songs and stories with audio files (this might be a useful literacy aid).

The next generation of database system is also being designed to hold more complex forms of data, such as geospatial information and genealogies. There is currently only one other system on the market that has begun to grapple with the handling of more complex geospatial data[14]. Perhaps more importantly, new data management systems will have to find better ways of presenting data in a way that brings Indigenous perspectives to the fore and builds upon the access and

[13] Detailed specifications for the new software are contained within Northern Territory Library (2008) *Community Stories System Requirements Specification: Version 1*. NTL, Darwin

[14] Cultural Systems Solutions - http://www.culturalss.com.au/

authorisation structure of the *Our Story* model. Nevertheless, the inescapable need to upgrade the database system will continue to challenge - and provoke - future developments in the *Community Stories* program.

4.2 CHALLENGES FOR THE LKC PROGRAM

The future success of the LKC program will depend not only upon its ability to develop suitable software but also its ability to facilitate a flow of information between the various collecting institutions and communities. As digital repatriation gradually becomes more common, the LKCs may well require enhanced support during the research and negotiation stages. NTL could play an important role in facilitating connections between collecting institutions, collectors (researchers etc) and communities. A number of other long-term challenges regarding legal ownership of the collections, and allowing those outside the communities to access their collections will most certainly persist.

Even so, by listening to the needs of Northern Territory Indigenous communities, and learning from similar programs across Australia, NTL has been able to implement a distinctive information technology service with some success. The creation of these digital collections has enabled marginalised and isolated communities to access and preserve materials that are extremely important to the cultural and historical identity of the user base. Unlike other 'database' projects that administer a collection on behalf of the community, or present short-term project-based solutions, the LKC model rightly places responsibility with the locally employed Community Library Officers who act on behalf of their communities.

SECTION 5: APPENDICES

APPENDIX A: RELEVANT PROJECTS

The past 10 years has seen a number of projects investigating various digital approaches to Indigenous knowledge management and repatriation. These research projects have begun to explore the future of Indigenous digital heritage collections and what functionality might best suit new systems. For example, the TAMI (Text Audio Media and Images) design is an excellent proof-of-concept design based on field research with Yolngu people in East Arnhem Land (Verran, 2006).

The Traditional Knowledge Revival Pathways project based in northern Queensland[15], the *Ara Irititja* project in South Australia, the *Mukurtu* Project in Tennant Creek, the *Martu Kanyirninpa Jukurrpa* History and Archive Project, and the Northern Territory Library are all exploring various funding options for the development of standards for the management of Indigenous data. The major focus of all of these projects is the development of community-friendly and community-oriented archives.

Table 2: Operating Indigenous Community Database Systems

Database Name	Managed	Location/s	Data Types
Ara Irititja	Centrally	14 sites across the APY lands. A number of other commercial clients across Australia and internationally.	Text, Audio, Video, Image.
Our Story	Locally	14 sites within the Northern Territory.	Text, Audio, Video, Image.
Mukurtu	Locally	Tennant Creek, NT.	Text, Audio, Video, Image.
CMS	Locally	Uluru, Wet Tropics QLD, Jawoyn Association, NT.	Geospatial, Text, Audio, Video, Image, Rockart data.
Traditional Knowledge Recording Project	Locally	Cape York, QLD.	Text, Audio, Video, Image.
Martu Kanyirninpa Jukurrpa (Ara Irititja Software)	Centrally	Parnngurr, WA	Text, Audio, Video, Image.

[15] This project has received some assistance from the University of Technology Sydney, School of Design.

APPENDIX B: RELEVANT RESOURCES AND WEBLINKS

Aboriginal and Torres Strait Islander Library and Information Resources Network Protocols (2005)

http://www1.aiatsis.gov.au/atsilirn/protocols.atsilirn.asn.au/ATSILIRNprotocols.pdf

AIATSIS Audiovisual Archive Collections Management Policy Manual

http://www.aiatsis.gov.au/audiovisual_archives/audiovisual_archives_collection_management_policy_manual

Ara Irititja Project

http://www.irititja.com/

Mukurtu Wumpurrani-kari Archive

http://www.mukurtuarchive.org/

National Recording Project Archiving protocols

http://www.aboriginalartists.com.au/NRP_protocols.htm

NSLA Protocols

http://www.nsla.org.au/publications/policies/2007/pdf/NSLA.Policy-20070129-National.Policy.Framework.for.Indigenous.Library.Services.pdf

State Library of Qld Protocols for Aboriginal and Torres Strait Islander Collections

http://www.slq.qld.gov.au/__data/assets/pdf_file/0006/64599/SLQ_-_Protocols_for_Indigenous_Collections.pdf

APPENDIX C: MAP OF NT PUBLIC LIBRARIES AND KNOWLEDGE CENTRES

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